FMGE June 2024 Question Paper

212 recall questions with answers and explanations.

Recall honesty note: NBEMS does not release official papers, so these are memory-based recall questions, not official papers. Image-based questions are excluded for now because the bank's images are currently unavailable.

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Question 1. Which anatomical structure is located approximately 25 cm from the central incisor?

A. Cricopharynx

B. Arch of Aorta

C. Left principal bronchus

D. Diaphragm

Correct answer: A

According to many clinical/endoscopic sources (as in your key), the cricopharynx (upper esophageal sphincter) is located approximately 25 cm from the central incisors. It marks the junction of the pharynx and esophagus and acts as a functional sphincter preventing air entry during respiration and reflux during swallowing. It is also a key site evaluated in conditions like dysphagia and Zenker’s diverticulum.

Why other options are incorrect:

(B)

Arch of Aorta: This produces a physiological constriction slightly lower, around 30 cm, not at 25 cm in this reference system.

(C)

Left principal bronchus: It crosses the esophagus at about 35 cm, causing another constriction, but is located further down.

(D)

Diaphragm: The esophageal hiatus is found at 40–45 cm, representing the lowest constriction near the gastroesophageal junction.

Question 2. Which type of epithelium lines the trachea?

A. Simple squamous epithelium

B. Transitional epithelium

C. Stratified squamous epithelium

D. Pseudostratified ciliated columnar

Correct answer: D

The trachea is lined by pseudostratified ciliated columnar epithelium, often referred to as respiratory epithelium. Although it appears layered (stratified) because cell nuclei are at different heights, every cell is actually in contact with the basement membrane, making it a "pseudo" stratified tissue. This epithelium contains goblet cells that secrete mucus to trap inhaled particles and cilia that move the mucus upward toward the pharynx (the mucociliary escalator). Simple squamous epithelium (Option A) lines the alveoli for gas exchange. Transitional epithelium (Option B) is characteristic of the urinary tract, such as the bladder, allowing for distension. Stratified squamous epithelium (Option C) is found in areas prone to abrasion, like the esophagus and skin. In chronic smokers, the tracheal epithelium may undergo metaplasia, changing to stratified squamous epithelium to survive the irritation, which unfortunately destroys the protective ciliary mechanism, leading to a persistent "smoker's cough."

Question 3. Which muscle movements are related to the

Abducens nerve?

A. Lateral rectus

B. Medial rectus

C. Superior oblique

D. Inferior oblique

Correct answer: A

The Abducens nerve (Cranial Nerve VI) is purely a motor nerve that innervates a single extraocular muscle: the lateral rectus. The primary function of the lateral rectus muscle is to abduct the eye, moving it laterally away from the midline. The medial rectus (Option B), superior rectus, inferior rectus, and inferior oblique (Option D) are all innervated by the Oculomotor nerve (CN III). The superior oblique muscle (Option C) is innervated by the Trochlear nerve (CN IV). A classic mnemonic for eye muscle innervation is , where 6 refers to the abducens and 4 to the trochlear. Clinical paralysis of the abducens nerve results in the inability to abduct the affected eye, leading to convergent strabismus (esotropia) and horizontal diplopia (double vision) that worsens when looking toward the side of the affected muscle. This nerve has a long intracranial course, making it susceptible to damage from increased intracranial pressure.

Question 4. 7.

A. Spinal accessory nerve

B. Long thoracic nerve

C. Spinal branch of axillary nerve

D. Radial nerve

Correct answer: A

The image depicts a person shrugging their shoulders, an action primarily performed by the trapezius muscle. The spinal accessory nerve (Cranial Nerve XI) provides motor innervation to the trapezius and the sternocleidomastoid muscles. Shrugging tests the upper fibers of the trapezius. The long thoracic nerve (Option B) supplies the serratus anterior muscle; damage to this nerve leads to "winging of the scapula". The axillary nerve (Option C) supplies the deltoid and teres minor muscles. The radial nerve (Option D) innervates the triceps brachii and the extensor muscles of the forearm. Clinically, injury to the spinal accessory nerve—often occurring during neck surgeries like lymph node biopsies—leads to shoulder droop and the inability to shrug the shoulder on the affected side. Patients may also experience difficulty in rotating their head to the opposite side due to involvement of the sternocleidomastoid muscle.

Question 5. 9.

A. Symphysis

B. Synchondrosis

C. Synostosis

D. Syndesmosis

Correct answer: B

The joint between the epiphysis and the diaphysis of a growing long bone is the epiphyseal plate (growth plate), which is a type of synchondrosis. This is a primary cartilaginous joint where the bones are joined by hyaline cartilage. These joints are typically temporary and allow for longitudinal bone growth. A symphysis (Option A) is a secondary cartilaginous joint where bones are joined by fibrocartilage, such as the pubic

symphysis or intervertebral discs. A synostosis (Option C) occurs when a joint completely ossifies and becomes bone, which is what happens to the epiphyseal plate once growth is complete. A syndesmosis (Option D) is a fibrous joint where bones are joined by an interosseous ligament, like the inferior tibiofibular joint. Understanding the nature of the epiphyseal plate is critical in pediatric orthopedics, particularly when managing Salter-Harris fractures, which involve injuries through this cartilage layer and can potentially lead to stunted or asymmetric limb growth if not treated correctly.

A patient has a cavernous sinus infection affecting the nerve located medially within the sinus. To assess involvement of the abducens nerve, in which direction should you ask the patient to move their eye?

(A)
Superior
(B)
Inferior
(C)
Medial
(D)
Lateral

Question 6. 10. (B)Synchondrosis
The joint between the epiphysis and the diaphysis of a growing long bone is the epiphyseal plate (growth plate), which is a type of synchondrosis. This is a primary cartilaginous joint where the bones are joined by hyaline cartilage. These joints are typically temporary and allow for longitudinal bone growth. A symphysis (Option A) is a secondary cartilaginous joint where bones are joined by fibrocartilage, such as the pubic symphysis or intervertebral discs. A synostosis (Option C) occurs when a joint completely ossifies and becomes bone, which is what

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A patient has a cavernous sinus infection affecting the nerve located medially within the sinus. To assess involvement of the abducens nerve, in which direction should you ask the patient to move their eye?

A. Superior

B. Inferior

C. Medial

D. Lateral

Correct answer: D

The cavernous sinus contains several cranial nerves (III, IV, , , and VI). The abducens nerve (CN VI) is unique because it travels through the center of the sinus, medially placed near the internal carotid artery, while the others are in the lateral wall. As established previously, the abducens nerve innervates the lateral rectus muscle, which is responsible for abducting the eye. Therefore, to test its function and confirm involvement, the clinician must ask the patient to look laterally (away from the midline). Looking superiorly (Option A), inferiorly (Option B), and medially (Option C) primarily tests the muscles innervated by the oculomotor nerve (CN III). In cavernous sinus thrombosis, the abducens nerve is often the first nerve affected due to its central location. Patients will present with an inability to move the eye outward and will experience double vision when trying to do so. This clinical correlation is a classic "must-know" for medical

examinations.

Which type of blood can be safely transfused to a patient with the Bombay (Oh) blood group?

(A)

A

(B)

B

(C)

AB

(D)

O negative

Question 7. 11. (D)Lateral

The cavernous sinus contains several cranial nerves (III, IV, , , and VI). The abducens nerve (CN VI) is unique because it travels through the center of the sinus, medially placed near the internal carotid artery, while the others are in the lateral wall. As established previously, the abducens nerve innervates the lateral rectus muscle, which is responsible for abducting the eye. Therefore, to test its function and confirm involvement, the clinician must ask the patient to look laterally (away from the midline). Looking superiorly (Option A), inferiorly (Option B), and medially (Option C) primarily tests the muscles innervated by the oculomotor nerve (CN III). In cavernous sinus thrombosis, the abducens nerve is often the first nerve affected due to its central location. Patients will present with an inability to move the eye outward and will experience double vision when trying to do so. This clinical correlation is a classic "must-know" for medical examinations.

Which type of blood can be safely transfused to a patient with the Bombay (Oh) blood group?

A. A

B. B

C. AB

D. O negative

Correct answer: D

A patient with the Bombay blood group (Oh phenotype) lacks the H antigen, which is present in all other blood groups (A, B, AB, and O). They also have anti-A, anti-B, and anti-H antibodies. Therefore, scientifically, such patients can receive only Bombay blood, because even O negative blood contains H antigen and can trigger a severe hemolytic reaction.

However, in some exam contexts or emergency situations, O negative blood is considered the best available option, especially when Bombay blood is not readily available. Hence, exam keys may mark O negative as the answer.

Why other options are incorrect:

(A) A blood: Contains A and H antigens → reacts with anti-A and anti-H antibodies.

(B) B blood: Contains B and H antigens → reacts with anti-B and anti-H antibodies.

(C) AB blood: Contains A, B, and H antigens → highly incompatible.

Thus, while Bombay blood is ideal, the exam-oriented answer is O negative.

Which hormone is produced from the layer marked in the given image?

(A)

Androgen

(B)

Cortisol

(C)

Corticosterone

(D)

Epinephrine

Question 8. Gastric lavage is contraindicated in which of the following poisonings?

A. Strychnine

B. Paraldehyde

C. Hydrocarbons

D. Iron tablets

Correct answer: C

Gastric lavage ("pumping the stomach") is a common decontamination procedure, but it is strictly contraindicated in hydrocarbon poisoning (e.g., kerosene, gasoline, or thinner). These substances have low viscosity and high volatility. During the process of lavage or vomiting, they can easily be aspirated into the lungs, where even a tiny amount can cause a severe, life-threatening chemical pneumonitis. Lavage is also contraindicated in corrosive (acid/alkali) poisoning due to the risk of esophageal perforation. Strychnine (Option A) and Paraldehyde (Option B) poisonings can be managed with lavage if done early. For iron tablet poisoning (Option D), whole bowel irrigation is often preferred over simple lavage because the tablets are large and heavy and difficult to remove through a tube. In hydrocarbon cases, management is purely supportive, and inducing vomiting must be avoided at all costs to protect the patient's airway.

MICROBIOLOGY

Question 9. 14. (A)Spurious

A spurious relationship is a mathematical relationship in which two variables have no direct causal connection, yet it may be wrongly inferred that they do, usually due to the presence of a third, unseen factor (a confounding variable). In this scenario, drinking iced tea doesn't cause weight loss. Instead, individuals who are disciplined enough to work out regularly (the real cause of weight loss) might also happen to prefer iced tea. The observed association between iced tea and weight loss is coincidental or influenced by the workout itself. A relative relationship (Option B) isn't a standard term in this context. A direct relationship (Option C) would mean iced tea chemically causes weight loss. An indirect relationship (Option D) would mean iced tea leads to another factor that then causes weight loss. Recognizing spurious correlations is vital in medical research to avoid drawing false conclusions about treatments or

lifestyle habits. Researchers use randomized controlled trials to eliminate these confounding variables and establish true causality.

Which part of renal tubules reabsorbs maximum water in the presence of ADH?

A. PCT

B. DCT

C. Loop of Henle

D. Collecting duct

Correct answer: D

Antidiuretic hormone (ADH, vasopressin) acts mainly on the late distal tubule and collecting

Question 10. 16. (A)Growth Hormone (GH) Growth Hormone (GH) secretion is pulsatile and is significantly stimulated by various physiological factors, including stress, starvation (hypoglycemia), and deep sleep (Stage 3 and 4). During starvation, GH helps mobilize fatty acids for energy while sparing glucose. Its secretion peaks during the early hours of deep sleep, which is vital for tissue repair and growth in children. Glucocorticoids/Cortisol (Options B and C) definitely increase during stress and starvation but typically decrease during sleep. Prolactin (Option D) levels do rise during sleep and stress, but its primary stimulus is not starvation; rather, it's related to lactation and reproductive triggers. Understanding these hormonal triggers is crucial for diagnosing endocrine disorders. For example, the "insulin tolerance test" uses insulin-induced hypoglycemia (a form of starvation stress) to test if the pituitary gland can normally secrete GH. If GH levels fail to rise during this test, it indicates a deficiency.

What is the typical Glomerular Filtration Rate (GFR) in a healthy adult?

A. 125 ml/min

B. 200 ml/min

C. 100 ml/min

D. 150 ml/min

Correct answer: A

The Glomerular Filtration Rate (GFR) is a measure of how much filtrate the kidneys produce each minute. In a healthy adult, the typical GFR is approximately 125 ml/min. This equates to roughly 180 liters per day. However, about 99% of this filtrate is reabsorbed, resulting

Question 11. Peripheral chemoreceptors, located in the carotid and aortic bodies, are specialized cells that detect changes in blood , , and . The primary mechanism for detecting hypoxia (low) involves oxygen-sensitive (potassium) channels. Under normal oxygen conditions, these channels remain open, allowing to exit the cell and maintain a resting membrane potential. When blood oxygen levels drop, these oxygen-sensitive channels close. This prevents from leaving the cell, leading to membrane depolarization. This depolarization then opens voltage-gated channels (Option C), leading to an influx of calcium and the release of neurotransmitters (like ATP or dopamine) that stimulate the afferent nerves to increase the breathing rate. Sodium (Na+) (Option B) and Chloride (Cl-) (Option D) channels are not the primary oxygen-sensitive triggers in these cells. This precise molecular mechanism ensures that the body rapidly responds to life-threatening drops in arterial oxygen by stimulating hyperventilation.

Which of the following best describes the role of a second messenger in cellular signaling?

A. Act on extracellular receptors

B. Modulate extracellular hormone response

C. Modulate intracellular hormone response

D. Directly interact with the cell's DNA

Correct answer: C

Second messengers are intracellular signaling molecules released by the cell in response to the exposure of extracellular signaling molecules (the first messengers, like peptide hormones or neurotransmitters). Their primary role is to modulate the intracellular response to the hormone. For example, when epinephrine binds to a surface receptor, it triggers the production of cAMP (a second messenger), which then

Question 12. activates various enzymes inside the cell to carry out the hormone's instructions. Second messengers do not act on extracellular receptors (Option A) or modulate extracellular responses (Option B). While the end result of a signaling pathway might involve gene expression, second messengers typically activate a cascade of proteins rather than directly interacting with the cell's DNA (Option D). Common examples of second messengers include cAMP, , DAG, and . They allow for the amplification of the signal, meaning a single hormone molecule can trigger a massive cellular response.

Which ion is primarily responsible for the function of oxygen-sensitive channels in peripheral chemoreceptors?

A. Potassium (K+)

B. Sodium (Na+)

C. Bicarbonate (HCO3

-)

D. Chloride (Cl-)

Correct answer: A

As detailed in Question 18, the detection of low arterial oxygen levels by peripheral chemoreceptors is fundamentally tied to Potassium (K+) ions. The closure of channels in response to hypoxia is the initiating event that leads to cellular excitation. Sodium (Na+) (Option B) is involved in the later stages of action

potential generation but is not the primary ion for the "oxygen-sensitive" channel itself. Bicarbonate (HCO_3^-) (Option C) and Chloride (Cl^-) (Option D) are vital for acid-base balance and transport but do not serve as the primary triggers for oxygen sensing. The carotid bodies, located at the bifurcation of the common carotid arteries, are the most important peripheral chemoreceptors for the hypoxic drive. Their high rate of blood flow and sensitive channel mechanism allow them to continuously monitor arterial blood and send immediate signals to the respiratory centers in the medulla via the glossopharyngeal nerve whenever oxygen levels become critically low.

Which of the following components is absent in smooth muscle?

(A)
Actin

(B)
Myosin

(C)
Tropomyosin

(D)
Troponin

Question 13. 28. (B)Glucuronidation

The process of converting unconjugated (often lipid-soluble) substances into conjugated (water-soluble) forms is a key part of Phase II metabolism in the liver. The most common form of this is glucuronidation, where glucuronic acid is attached to the substance. This makes the molecule more polar, allowing it to be easily excreted in the bile or urine. Glycation (Option

A) is the non-enzymatic binding of sugar to proteins (e.g., HbA1c). Glycosylation (Option B) is the enzymatic addition of sugars to proteins or lipids during cell signaling. Oxidation (Option D) is a Phase I metabolic reaction that often introduces a functional group but does not involve conjugation. A classic example of glucuronidation is the metabolism of bilirubin. Heme breakdown produces unconjugated bilirubin, which is toxic and insoluble. The liver enzyme UDP-glucuronosyltransferase (UGT) conjugates it with glucuronic acid to form water-soluble conjugated bilirubin, which can then be safely excreted. Deficiencies in this process lead to jaundice, as seen in Gilbert or Crigler-Najjar syndromes.

Which type of ion channel is affected by mutations in the CFTR gene?

A. Chloride

B. Sodium

C. Potassium

D. Calcium

Correct answer: A

The CFTR (Cystic Fibrosis Transmembrane Conductance Regulator) gene encodes a protein that functions as a chloride ion channel located in the membranes of epithelial cells. Mutations

Question 14. 20. (A)Potassium

As detailed in Question 18, the detection of low arterial oxygen levels by peripheral chemoreceptors is fundamentally tied to Potassium (K+) ions. The closure of channels in response to hypoxia is the initiating event that leads to cellular excitation. Sodium (Na+) (Option B) is involved in the later stages of action

potential generation but is not the primary ion for the "oxygen-sensitive" channel itself. Bicarbonate (HCO3 -) (Option C) and Chloride (Cl-) (Option D) are vital for acid-base balance and transport but do not serve as the primary triggers for oxygen sensing. The carotid bodies, located at the bifurcation of the common carotid arteries, are the most important peripheral chemoreceptors for the hypoxic drive. Their high rate of blood flow and sensitive channel mechanism allow them to continuously monitor arterial blood and send immediate signals to the respiratory centers in the medulla via the glossopharyngeal nerve whenever oxygen levels become critically low.

Which of the following components is absent in smooth muscle?

A. Actin

B. Myosin

C. Tropomyosin

D. Troponin

Correct answer: D

Smooth muscle contraction differs significantly from skeletal and cardiac muscle. A major difference is that troponin is absent in smooth muscle. In striated muscles, troponin is the protein that binds calcium to initiate contraction. In smooth muscle, this role is taken over by a protein called calmodulin. Actin (Option A) and Myosin (Option B) are the primary contractile proteins present in all muscle types. Tropomyosin (Option C) is also present in smooth muscle, but its role is less clear than

Question 15. in striated muscle, where it blocks the myosin-binding sites on actin. Instead of the troponin-tropomyosin complex, smooth muscle relies on the phosphorylation of the myosin light chain

by the enzyme Myosin Light Chain Kinase (MLCK). This unique biochemical pathway allows smooth muscle to maintain long-term contraction (tone) with very little energy expenditure, a feature essential for the function of blood vessels and the gastrointestinal tract.

Which protein does calcium bind to during smooth muscle contraction?

A. Calmodulin

B. Troponin

C. Topoisomerase

D. Actin

Correct answer: A

In smooth muscle, contraction is initiated when an increase in intracellular calcium leads to calcium binding to calmodulin. The calcium-calmodulin complex then activates an enzyme called Myosin Light Chain Kinase (MLCK). MLCK phosphorylates the myosin heads, allowing them to bind to actin and initiate the cross-bridge cycle. Troponin (Option B) is the calcium-binding protein in skeletal and cardiac muscle, but as noted previously, it is absent in smooth muscle. Topoisomerase (Option C) is an enzyme involved in DNA replication and transcription, unrelated to muscle contraction. While actin (Option D) is involved in the contraction process, calcium does not bind directly to it. This calmodulin-dependent pathway is slower than the troponin-dependent pathway found in skeletal muscle, which explains why smooth muscle contractions are generally slower but can be more sustained. Pharmacological agents that block calcium channels or inhibit calmodulin can effectively relax smooth muscle, making them useful treatments for hypertension and asthma.

How does a muscle spindle detect changes in muscle length during contraction?

(A)

Stretch receptor on the tendon

(B)

Stretch receptor in the muscle belly

(C)

Golgi tendon organ

(D)

Mechanoreceptor in the joint capsule

Question 16. 22. (A)Calmodulin

In smooth muscle, contraction is initiated when an increase in intracellular calcium leads to calcium binding to calmodulin. The calcium-calmodulin complex then activates an enzyme called Myosin Light Chain Kinase (MLCK). MLCK phosphorylates the myosin heads, allowing them to bind to actin and initiate the cross-bridge cycle. Troponin (Option B) is the calcium-binding protein in skeletal and cardiac muscle, but as noted previously, it is absent in smooth muscle. Topoisomerase (Option C) is an enzyme involved in DNA replication and transcription, unrelated to muscle contraction. While actin (Option D) is involved in the contraction process, calcium does not bind directly to it. This calmodulin-dependent pathway is slower than the troponin-dependent pathway found in skeletal muscle, which explains why smooth muscle contractions are generally slower but can be more sustained. Pharmacological agents that block calcium channels or inhibit calmodulin can effectively relax smooth muscle, making them useful treatments for hypertension and asthma.

How does a muscle spindle detect changes in muscle length during contraction?

A. Stretch receptor on the tendon

B. Stretch receptor in the muscle belly

C. Golgi tendon organ

D. Mechanoreceptor in the joint capsule

Correct answer: B

Muscle
spindles
are
specialized
sensory
receptors located deep within the muscle belly that function as stretch receptors. They are oriented in parallel with the extrafusal muscle fibers. When a muscle is stretched, the muscle spindle is also stretched, triggering sensory nerve impulses that inform the central nervous system about the muscle's length and the rate of change in its length. This information is crucial for maintaining posture and coordinating complex movements via the stretch reflex.
A stretch receptor on the tendon (Option A)

Question 17. is a misdescription. The Golgi tendon organ (Option C) is a different type of receptor located in the tendons that detects muscle tension (force), rather than length. Mechanoreceptors in the joint capsule (Option D) provide information about joint position and movement (proprioception) but do not monitor muscle length directly. Muscle spindles are innervated by gamma motor neurons, which regulate their sensitivity, ensuring they can detect stretch even when the muscle is already contracted.

What is the composition of lactulose?

A. Glucose + Galactose

B. Glucose + Fructose

C. Galactose + Fructose

D. Fructose + Ribulose

Correct answer: C

Lactulose
is
a

synthetic,
non-absorbable
disaccharide widely used as an osmotic
laxative and in the management of hepatic
encephalopathy.
It
is
composed
of
the
monosaccharides galactose and fructose.
1. Glucose + Galactose (Option A) forms
lactose, the natural milk sugar.
2. Glucose + Fructose (Option B) forms
sucrose (table sugar).
3. Fructose + Ribulose (Option D) is not a
physiologically relevant disaccharide.
Humans lack the intestinal enzyme (lactulase)
required to digest lactulose, so it reaches the
colon unchanged. Colonic bacteria ferment
lactulose into short-chain organic acids (e.g.,
lactic and acetic acids), which acidify the colonic
lumen. This acidic environment converts
ammonia (NH_3) into ammonium (NH_4^+), a
non-absorbable form, thereby reducing systemic
ammonia levels—the key mechanism in
treating hepatic encephalopathy. Additionally,
its osmotic effect draws water into the colon,
producing a laxative action.
A patient who engaged in strenuous exercise, skipped a meal, and later consumed alcohol at a party— which metabolic process is inhibited by alcohol intake in this scenario?
(A)
Gluconeogenesis
(B)
Glycogenolysis
(C)
HMP shunt
(D)

Question 18. 24. (C)Galactose + Fructose

Lactulose is a synthetic, non-absorbable disaccharide widely used as an osmotic laxative and in the management of hepatic encephalopathy. It is composed of the monosaccharides galactose and fructose.

1. Glucose + Galactose (Option A) forms lactose, the natural milk sugar.

2. Glucose + Fructose (Option B) forms sucrose (table sugar).

3. Fructose + Ribulose (Option D) is not a physiologically relevant disaccharide.

Humans lack the intestinal enzyme (lactulase) required to digest lactulose, so it reaches the colon unchanged. Colonic bacteria ferment lactulose into short-chain organic acids (e.g., lactic and acetic acids), which acidify the colonic lumen. This acidic environment converts ammonia (NH_3) into ammonium (NH_4^+), a non-absorbable form, thereby reducing systemic ammonia levels—the key mechanism in treating hepatic encephalopathy. Additionally, its osmotic effect draws water into the colon, producing a laxative action.

A patient who engaged in strenuous exercise, skipped a meal, and later consumed alcohol at a party— which metabolic process is inhibited by alcohol intake in this scenario?

A. Gluconeogenesis

B. Glycogenolysis

C. HMP shunt

D. Ketone body formation

Correct answer: A

Alcohol metabolism in the liver significantly increases the ratio of to . This high ratio shifts metabolic reactions away from producing glucose. Specifically, it diverts pyruvate to lactate and oxaloacetate to malate, effectively inhibiting gluconeogenesis. In the scenario provided, the patient has already depleted their glycogen stores through strenuous exercise and fasting (starvation). Since they cannot perform gluconeogenesis due to alcohol, they are at a very high risk of developing severe, life-threatening fasting hypoglycemia. Alcohol does not primarily

Question 19. inhibit glycogenolysis (Option B); in fact, the body would have already used this process up during exercise. The HMP shunt (Option C) and ketone body formation (Option D) are not the primary targets of alcohol-induced metabolic inhibition. Clinical awareness of this "starvation + alcohol" interaction is vital for emergency room physicians, as these patients may present as unconscious or "drunk" when they are actually suffering from profound hypoglycemia that requires immediate intravenous glucose.

In which of the following clinical scenarios is rescue percutaneous coronary intervention (PCI) indicated?

A. Failed thrombolysis

B. Chronic stable angina

C. Prinzmetal's angina

D. NSTEMI

Correct answer: A

Rescue PCI is an emergency procedure performed on patients with an acute ST-elevation

myocardial infarction (STEMI) where initial thrombolytic therapy (fibrinolysis) has failed to restore blood flow to the heart muscle. Failure is usually indicated by persistent chest pain and a failure of ST-segment elevation to resolve by at least 50% within 60-90 minutes of starting the thrombolytic. Chronic stable angina (Option B) is typically managed with medication and elective, not rescue, PCI. Prinzmetal's (variant) angina (Option C) is caused by coronary artery vasospasm and is primarily treated with calcium channel blockers and nitrates. Non-ST-elevation myocardial infarction (NSTEMI) (Option D) usually requires an urgent or early invasive strategy, but the term "Rescue PCI" is specifically reserved for the post-thrombolysis STEMI scenario. Performing Rescue PCI in a timely manner is crucial to salvage myocardium and improve survival in these high-risk patients. It is considered a standard of care when the primary fibrinolytic approach fails to achieve reperfusion.

Which of the following is the disorder associated with hexanucleotide repeat?

(A)

Fragile X syndrome

(B)

Huntington disease

(C)

Myotonic dystrophy

(D)

Frontotemporal dementia

Question 20. 26. (A)Failed thrombolysis

Rescue PCI is an emergency procedure performed on patients with an acute ST-elevation myocardial infarction (STEMI) where initial thrombolytic therapy (fibrinolysis) has failed to restore blood flow to the heart muscle. Failure is

usually indicated by persistent chest pain and a failure of ST-segment elevation to resolve by at least 50% within 60-90 minutes of starting the thrombolytic. Chronic stable angina (Option B) is typically managed with medication and elective, not rescue, PCI. Prinzmetal's (variant) angina (Option C) is caused by coronary artery vasospasm and is primarily treated with calcium channel blockers and nitrates. Non-ST-elevation myocardial infarction (NSTEMI) (Option D) usually requires an urgent or early invasive strategy, but the term "Rescue PCI" is specifically reserved for the post-thrombolysis STEMI scenario. Performing Rescue PCI in a timely manner is crucial to salvage myocardium and improve survival in these high-risk patients. It is considered a standard of care when the primary fibrinolytic approach fails to achieve reperfusion.

Which of the following is the disorder associated with hexanucleotide repeat?

A. Fragile X syndrome

B. Huntington disease

C. Myotonic dystrophy

D. Frontotemporal dementia

Correct answer: D

While many neurodegenerative disorders are caused by trinucleotide repeat expansions, Frontotemporal dementia (FTD) and Amyotrophic Lateral Sclerosis (ALS) are uniquely associated with a hexanucleotide repeat expansion (GGGGCC) in the C9orf72 gene. This is the most common genetic cause of both familial FTD and familial ALS.

In contrast, Fragile X syndrome (Option A) results from a CGG trinucleotide repeat

expansion in the FMR1 gene. Huntington disease

Question 21. (Option B) is caused by a CAG trinucleotide repeat expansion in the HTT gene. Myotonic dystrophy (Option C) is associated with a CTG trinucleotide repeat expansion.
The pathogenic C9orf72 hexanucleotide expansion leads to the formation of toxic RNA foci and dipeptide repeat proteins, which accumulate within neurons and cause neuronal dysfunction and death.
Clinically, FTD is characterized by early changes in personality, behavior, executive function, and language, typically presenting between 45 and 65 years of age, earlier than Alzheimer disease. Recognizing this specific hexanucleotide repeat expansion is crucial for accurate diagnosis, prognostication, and genetic counseling in patients with FTD–ALS spectrum disorders.
What is the term for the process of converting unconjugated substances into their conjugated forms?
A. Glycation
B. Glucuronidation
C. Glycosylation
D. Oxidation
Correct answer: B
The process of converting unconjugated (often lipid-soluble) substances into conjugated (water-soluble) forms is a key part of Phase II metabolism in the liver. The most common form of this is glucuronidation, where glucuronic acid is attached to the substance. This makes the molecule more polar, allowing it to be easily excreted in the bile or urine. Glycation (Option

A) is the non-enzymatic binding of sugar to proteins (e.g., HbA1c). Glycosylation (Option B) is the enzymatic addition of sugars to proteins or lipids during cell signaling. Oxidation (Option D) is a Phase I metabolic reaction that often introduces a functional group but does not involve conjugation. A classic example of glucuronidation is the metabolism of bilirubin. Heme breakdown produces unconjugated bilirubin, which is toxic and insoluble. The liver enzyme UDP-glucuronosyltransferase (UGT) conjugates it with glucuronic acid to form water-soluble conjugated bilirubin, which can then be safely excreted. Deficiencies in this process lead to jaundice, as seen in Gilbert or Crigler-Najjar syndromes.

Which type of ion channel is affected by mutations in the CFTR gene?

(A)
Chloride

(B)
Sodium

(C)
Potassium

(D)
Calcium

Question 22. in this gene cause Cystic Fibrosis. This channel is vital for regulating the movement of salt and water in and out of cells. In the lungs, a defective CFTR channel prevents the normal secretion of chloride and water, leading to the production of abnormally thick, sticky mucus that traps bacteria and causes recurrent infections. In the sweat glands, it prevents the reabsorption of chloride, leading to "salty sweat," which is

the basis for the diagnostic sweat chloride test.
Sodium (Option B), Potassium (Option C),
and Calcium (Option D) channels are not the
primary proteins affected by CFTR mutations.
The most common mutation is , which leads to
misfolding of the protein. Modern treatments
include CFTR modulators that help the defective
channel function more normally, significantly
improving the quality of life and lifespan for
these patients.

Which hormone is secreted by the structure indicated by the arrow?

A. Glucocorticoid

B. DHEA

C. Androgens

D. Mineralocorticoid

Correct answer: A

The arrow in the image points to the zona fasciculata, the middle layer of the adrenal cortex. This layer is characterized by large, pale-staining cells (spongiocytes) arranged in straight cords, due to abundant lipid content. These features help distinguish it from the darker outer zona glomerulosa and inner zona reticularis.

The zona fasciculata primarily secretes glucocorticoids, especially cortisol, which plays an important role in:

1. Metabolism (gluconeogenesis, glycogen storage)
2. Stress response
3. Immune modulation

Why other options are incorrect:

(B) DHEA: Produced by the zona reticularis (inner cortical layer), not the fasciculata.

(C) Androgens: Also secreted by the zona reticularis, not the middle layer.
(D) Mineralocorticoid: Produced by the zona glomerulosa (outermost layer), responsible for aldosterone secretion.
Since the marked region is zona fasciculata, the correct answer is glucocorticoid (cortisol).
Which of the following is characteristic of hypovolemic shock?
(A)
Increase cardiac output
(B)
High vascular resistance
(C)
Increase Venous pressure
(D)
Increased mixed venous saturation

Question 23. leading to reduced tissue perfusion. In response, the body activates the sympathetic nervous system to preserve perfusion to vital organs. This compensatory response causes marked peripheral vasoconstriction, leading to an increase in systemic vascular resistance (SVR)—the key hemodynamic change in hypovolemic shock.
Because circulating volume is reduced, cardiac output is decreased (not increased), as both preload and stroke volume fall. Venous pressure, including central venous pressure (CVP), is also decreased due to reduced venous return. Additionally, mixed venous oxygen saturation (SvO_2) is low, reflecting increased tissue oxygen extraction from a diminished blood supply.
Clinically, patients present with tachycardia, hypotension, cold and clammy skin, delayed capillary refill, and oliguria. These signs reflect intense vasoconstriction and poor perfusion.

Management focuses on rapid volume replacement using intravenous crystalloids or blood transfusion, depending on the cause, to restore preload, improve cardiac output, and reverse shock.

A 50-year-old woman presents with cervical lymphadenopathy. Biopsy shows granulomatous necrotizing inflammation. Which of the following statements is correct?

A. Metastatic calcification with normal serum calcium level

B. Dystrophic calcification with normal serum calcium level

C. Metastatic calcification with increased serum calcium level

D. Dystrophic calcification with increased serum calcium level

Correct answer: B

calcium level

The biopsy findings of granulomatous necrotizing inflammation (classic for tuberculosis) indicate tissue damage and cell death. In such areas of necrosis, calcium salts often deposit; this is called dystrophic calcification. A hallmark of dystrophic calcification is that it occurs in damaged or dead tissues even when serum calcium levels are normal. In contrast, metastatic calcification (Options A and C) refers to calcium deposition in normal tissues due to high serum calcium levels (hypercalcemia) from conditions like hyperparathyroidism or bone malignancy. Dystrophic calcification with increased calcium (Option D) is incorrect because the process itself is independent of serum calcium levels. Grossly, dystrophic calcification appears as gritty, white, sand-like deposits. Microscopically, it appears as basophilic (blue/purple) amorphous clumps. In the case of old tubercular lymph nodes or lung lesions, these calcifications are often visible on X-rays as bright radio-opaque spots, serving as

Question 24. permanent markers of past infection and tissue injury.

A 65-year-old man presents with progressive fatigue, easy bruising, and recurrent infections. Peripheral blood smear shows macrocytosis and dysplastic neutrophils with hyposegmented nuclei (pseudo–Pelger-Huët anomaly). What is the most likely diagnosis?

A. Iron Deficiency Anemia (IDA)

B. Myelodysplastic Syndrome

C. Aplastic Anemia

D. Anemia of Chronic Disease

Correct answer: B

The patient's age and presentation of pancytopenia (fatigue/anemia, bruising/thrombocytopenia, and infections/leukopenia) suggest a bone marrow disorder. The definitive clue is the presence of dysplastic neutrophils with hyposegmented nuclei (pseudo-Pelger-Huët anomaly) and macrocytosis on the blood smear, which are classic features of Myelodysplastic Syndrome (MDS). MDS is a group of clonal bone marrow disorders characterized by ineffective hematopoiesis and a high risk of transformation to Acute Myeloid Leukemia (AML). Iron Deficiency Anemia (Option A) would show microcytosis and is not associated with neutrophil dysplasia. Aplastic Anemia (Option C) presents with pancytopenia but the cells themselves are typically normal in morphology, not dysplastic. Anemia of Chronic Disease (Option D) is usually normocytic and doesn't explain the dysplasia or thrombocytopenia. MDS is often considered a "pre-leukemic" state. Diagnosis is

confirmed with a bone marrow biopsy showing hypercellularity with characteristic dysplastic changes in one or more cell lines.

The term “beaten bronze appearance” describes a characteristic textural change seen in certain corneal disorders. This appearance is associated with abnormalities in which corneal layer?

(A)
Endothelial Layer

(B)
Stroma

(C)
Sub-Epithelial Layer

(D)
Epithelial Layer

Question 25. 33. (B)Myelodysplastic Syndrome

The patient's age and presentation of pancytopenia (fatigue/anemia, bruising/ thrombocytopenia, and infections/leukopenia) suggest a bone marrow disorder. The definitive clue is the presence of dysplastic neutrophils with hyposegmented nuclei (pseudo-Pelger-Huët anomaly) and macrocytosis on the blood smear, which are classic features of Myelodysplastic Syndrome (MDS). MDS is a group of clonal bone marrow disorders characterized by ineffective hematopoiesis and a high risk of transformation to Acute Myeloid Leukemia (AML). Iron Deficiency Anemia (Option A) would show microcytosis and is not associated with neutrophil dysplasia.

Aplastic Anemia (Option C) presents with pancytopenia but the cells themselves are typically normal in morphology, not dysplastic. Anemia of Chronic Disease (Option D) is usually normocytic and doesn't explain the dysplasia or thrombocytopenia. MDS is often considered a "pre-leukemic" state. Diagnosis is confirmed with a bone marrow biopsy showing hypercellularity with characteristic dysplastic changes in one or more cell lines.

The term “beaten bronze appearance” describes a characteristic textural change seen in certain corneal disorders. This appearance is associated with abnormalities in which corneal layer?

A. Endothelial Layer

B. Stroma

C. Sub-Epithelial Layer

D. Epithelial Layer

Correct answer: A

The "beaten bronze" (or "beaten silver") appearance is a classic clinical description used in ophthalmology to describe the characteristic textural change seen on the corneal endothelial layer. This appearance is most famously associated with Fuchs' endothelial corneal dystrophy, although it can also be seen in cases of posterior polymorphous corneal dystrophy. The endothelium is the innermost layer of the cornea, responsible for pumping water out to keep the cornea clear. In these disorders, the endothelial cells become irregular, sparse, and may develop small outgrowths called guttae. Under the slit-lamp microscope using specular reflection, these guttae give the endothelium an irregular, dimpled appearance resembling hammered or beaten metal. The stroma (Option B), sub-epithelial layer (Option C), and epithelial layer (Option D) are not associated with this

Question 26. specific descriptor. As the disease progresses, the failing endothelium leads to corneal edema, causing blurred vision and eventually painful blisters (bullae) on the corneal surface, a condition known as bullous keratopathy.

Which test is considered the best for evaluating long-term glycemic control in diabetes mellitus?

A. Glycosylated Hemoglobin

B. Glycated Albumin

C. Serum Fructosamine

D. Urine Sugar

Correct answer: A

Glycosylated Hemoglobin (HbA1c) is the gold standard test for assessing long-term glycemic control in patients with diabetes mellitus. Because red blood cells have a lifespan of approximately 120 days, the HbA1c level reflects the average blood glucose concentration over the preceding 2-3 months. Glycated albumin (Option B) and serum fructosamine (Option C) reflect glycemic control over a much shorter period, typically the past 2-3 weeks. These are useful in specific conditions where HbA1c might be unreliable, such as in patients with hemolytic anemia or hemoglobinopathies. Urine sugar (Option D) is a poor marker as it only indicates that the blood glucose has exceeded the renal threshold at a specific moment and provides no information about long-term trends. For most diabetics, an HbA1c goal of less than 7% is recommended to reduce the risk of long-term microvascular complications like retinopathy, nephropathy, and neuropathy. It is a vital tool for both diagnosis and management.

What is the most common cause of thrombocytopenia in pregnancy?

(A)

Immune Thrombocytopenic Purpura (ITP)

(B)

Gestational Thrombocytopenia

(C)

HELLP Syndrome

(D)

Pre-eclampsia

Question 27. 35. (A)Glycosylated Hemoglobin Glycosylated Hemoglobin (HbA1c) is the gold standard test for assessing long-term glycemic control in patients with diabetes mellitus. Because red blood cells have a lifespan of approximately 120 days, the HbA1c level reflects the average blood glucose concentration over the preceding 2-3 months. Glycated albumin (Option B) and serum fructosamine (Option C) reflect glycemic control over a much shorter period, typically the past 2-3 weeks. These are useful in specific conditions where HbA1c might be unreliable, such as in patients with hemolytic anemia or hemoglobinopathies. Urine sugar (Option D) is a poor marker as it only indicates that the blood glucose has exceeded the renal threshold at a specific moment and provides no information about long-term trends. For most diabetics, an HbA1c goal of less than 7% is recommended to reduce the risk of long-term microvascular complications like retinopathy, nephropathy, and neuropathy. It is a vital tool for both diagnosis and management.

What is the most common cause of thrombocytopenia in pregnancy?

A. Immune Thrombocytopenic Purpura (ITP)

B. Gestational Thrombocytopenia

C. HELLP Syndrome

D. Pre-eclampsia

Correct answer: B

Thrombocytopenia (low platelet count) is common in pregnancy. The most common cause, accounting for about 70-80% of cases,

is
Gestational
Thrombocytopenia.
It
is
characterized by a mild decrease in platelets (usually) that typically occurs in the mid-to-late third trimester. It is a benign condition that is not associated with maternal or fetal bleeding and typically resolves spontaneously within 1-2 months postpartum. Immune Thrombocytopenic Purpura (ITP) (Option A) is less common and can present earlier in pregnancy. HELLP syndrome (Option C) and Pre-eclampsia (Option D) are serious, life-threatening hypertensive disorders of pregnancy that cause thrombocytopenia but are associated with other systemic symptoms like high blood pressure, liver enzyme elevation, and proteinuria. Distinguishing gestational

Question 28. thrombocytopenia from more serious conditions is crucial. While gestational thrombocytopenia requires no specific treatment other than monitoring, HELLP syndrome or severe pre-eclampsia requires immediate medical intervention and often urgent delivery of the fetus to save the mother's life.

Which of the following modes of inheritance is shown in the pedigree chart given below?

A. Autosomal dominant

B. Autosomal recessive

C. Mitochondrial inheritance

D. X-linked recessive

Correct answer: C

The pedigree chart displays a very specific pattern: an affected mother (I-1) has passed the trait to all of her children (II-2, II-3, II-4), whereas an affected father (II-4) has passed the trait to none of his children (III-3, III-4). This "all or nothing" pattern from the maternal side is the hallmark of mitochondrial inheritance (maternal inheritance). Because mitochondria are only inherited from the egg and not the sperm, only mothers can pass mitochondrial DNA mutations to their offspring. Autosomal dominant (Option A) would show transmission from either parent to about 50% of offspring. Autosomal recessive (Option B) typically skips generations and requires both parents to be carriers. X-linked recessive (Option D) usually affects males and is passed from carrier mothers to 50% of sons. Examples of mitochondrial diseases include Leber's Hereditary Optic Neuropathy (LHON) and Mitochondrial Encephalomyopathy, Lactic Acidosis, and Stroke-like episodes (MELAS). This unique inheritance pattern is a common and high-yield topic for medical board exams.

A 65-year-old patient on immunosuppressive therapy presents with cough, fever, and

pneumonitis. Biopsy shows the findings provided. Which organism is most likely responsible for this infection?

(A)

EBV

(B)

CMV

(C)

Pox virus

(D)

Chicken pox

Question 29. 37. (C) Mitochondrial inheritance

The pedigree chart displays a very specific pattern: an affected mother (I-1) has passed the trait to all of her children (II-2, II-3, II-4), whereas an affected father (II-4) has passed the trait to none of his children (III-3, III-4). This "all or nothing" pattern from the maternal side is the hallmark of mitochondrial inheritance (maternal inheritance). Because mitochondria are only inherited from the egg and not the sperm, only mothers can pass mitochondrial DNA mutations to their offspring. Autosomal dominant (Option A) would show transmission from either parent to about 50% of offspring. Autosomal recessive (Option B) typically skips generations and requires both parents to be carriers. X-linked recessive (Option D) usually affects males and is passed from carrier mothers to 50% of sons. Examples of mitochondrial diseases include Leber's Hereditary Optic Neuropathy

(LHON)

and

Mitochondrial Encephalomyopathy, Lactic Acidosis,

and
Stroke-like episodes (MELAS). This unique
inheritance pattern is a common and high-yield
topic for medical board exams.
A 65-year-old patient on immunosuppressive therapy presents with cough, fever, and pneumonitis. Biopsy shows the findings provided. Which organism is most likely responsible for this infection?
A. EBV
B. CMV
C. Pox virus
D. Chicken pox
Correct answer: B
The
histological
image
provided
is
the
pathognomonic finding for Cytomegalovirus
(CMV)
infection:
large,
infected
cells
(cytomegaly) containing prominent, basophilic,
intranuclear inclusions surrounded by a clear
halo, giving them an "owl's eye" appearance.
CMV is a significant opportunistic pathogen
in
immunocompromised
individuals,
such as transplant recipients or those on
immunosuppressive therapy, often causing
severe pneumonia (pneumonitis), retinitis,
or colitis. EBV (Option A) is associated with
atypical lymphocytes and Mononucleosis but
doesn't show owl's eye inclusions in tissues.
Pox virus (Option C) produces Guarnieri bodies

Question 30. (cytoplasmic inclusions), and Chicken pox (VZV) (Option D) produces Cowdry Type A inclusions but they lack the classic owl's eye symmetry of CMV. Recognizing these histological markers is vital for diagnosis, as CMV pneumonitis carries a high mortality rate if not treated promptly with antiviral medications like ganciclovir. This question highlights the importance of matching clinical context (immunosuppression) with classic pathological findings.

Which of the following organs is a primary lymphoid organ?

A. Lymph node

B. Spleen

C. Thymus

D. Liver

Correct answer: C

Primary lymphoid organs are the sites where lymphocytes (B cells and T cells) are generated and undergo maturation. There are only two primary lymphoid organs in humans: the bone marrow (where all blood cells are born and B cells mature) and the thymus (where T cells mature). The thymus is most active during childhood and gradually shrinks (atrophies) after puberty. Secondary lymphoid organs are where mature lymphocytes go to "work" and encounter antigens; these include the lymph nodes (Option A), spleen (Option B), and mucosal-associated lymphoid tissue (MALT) like the tonsils or Peyer's patches. The liver (Option D) is an accessory digestive organ and is not a lymphoid organ, although it does contain specialized immune cells called Kupffer cells. Understanding this division is fundamental for immunology. For example, DiGeorge syndrome involves a failure of the thymus to develop, leading to a profound deficiency of mature T cells and a severely compromised immune

system.

Which test is used in the detection of long term glucose tolerance?

(A)

Fasting blood glucose

(B)

Random blood glucose

(C)

HbA1C

(D)

CBC

Question 31. 39. (C)Thymus

Primary lymphoid organs are the sites where lymphocytes (B cells and T cells) are generated and undergo maturation. There are only two primary lymphoid organs in humans: the bone marrow (where all blood cells are born and B cells mature) and the thymus (where T cells mature). The thymus is most active during childhood and gradually shrinks (atrophies) after puberty. Secondary lymphoid organs are where mature lymphocytes go to "work" and encounter antigens; these include the lymph nodes (Option A), spleen (Option B), and mucosal-associated lymphoid tissue (MALT) like the tonsils or Peyer's patches. The liver (Option D) is an accessory digestive organ and is not a lymphoid organ, although it does contain specialized immune cells called Kupffer cells. Understanding this division is fundamental for immunology. For example, DiGeorge syndrome involves a failure of the thymus to develop, leading to a profound deficiency of mature T cells and a severely compromised immune system.

Which test is used in the detection of long term glucose tolerance?

A. Fasting blood glucose

B. Random blood glucose

C. HbA1C

D. CBC

Correct answer: C

As established in Question 35, HbA1c (Glycosylated Hemoglobin) is the definitive test for monitoring long-term glucose tolerance and control over the preceding 2-3 months. Fasting blood glucose (Option A) and random blood glucose (Option B) are "snapshots" that reflect the blood sugar level only at the specific moment the blood was drawn. While these are useful for acute diagnosis and daily management, they can be easily influenced by a single meal or recent exercise. CBC (Complete Blood Count) (Option D) measures red cells, white cells, and platelets and is not used to monitor glucose. An

Question 32. the sequestration of iron within macrophages, contributing to the "anemia of chronic disease" by limiting iron availability for erythropoiesis. Recognizing these patterns is essential for interpreting laboratory results; for instance, a low albumin level in an acutely ill patient may reflect the severity of the inflammatory response rather than poor nutritional status alone.

At what CD count does Kaposi's sarcoma typically present?

A. < 500

B. 200-350

C. < 200

D. > 500

Correct answer: C

Kaposi's sarcoma (KS) is an AIDS-defining illness caused by Human Herpesvirus 8 (HHV-

8). In patients with HIV, it typically presents when the immune system is significantly compromised, characterized by a CD4 count below 200 cells/mm^3. While it can occasionally occur at higher CD4 counts, the risk and severity increase dramatically as the count drops below this threshold. KS manifests as violaceous, non-blanching macules, plaques, or nodules on the skin, mucous membranes, or internal organs. Higher CD4 ranges like 200-350 (Option B) or (Option D) are associated with lower risks for most opportunistic infections and malignancies. The introduction of Highly Active Antiretroviral Therapy (HAART) has significantly reduced the incidence of KS by allowing patients to maintain higher CD4 counts and suppress HIV viral loads. Treatment of KS in HIV patients primarily focuses on immune reconstitution through HAART, though local therapies or systemic chemotherapy may be required for extensive disease.

Which of the following is the diagnostic test for carcinoid tumors?

(A)

24-hour urinary catecholamines

(B)

Serum calcitonin levels

(C)

Serum chromogranin A

(D)

Urinary 5-hydroxyindoleacetic acid

Question 33. HbA1c level of 6.5% or higher is currently used as a diagnostic criterion for diabetes mellitus, while a level between 5.7% and 6.4% indicates prediabetes. This test has revolutionized diabetes management by providing a reliable, long-term metric that correlates strongly with the risk of developing diabetic complications.

A 50-year-old man presents with lower back pain and a 1–1.5 mm osteolytic lesion at the T10 vertebra. Histopathological findings are provided. Which of the following statements about this condition is correct?

A. Presence of Bence-Jones proteinuria

B. Absence of Rouleaux formation

C. Absence of AL light chain

D. Decreased Calcium levels in blood

Correct answer: A

The clinical picture of a 50-year-old with back pain and a "punched-out" osteolytic lesion is highly suggestive of Multiple Myeloma. The histopathology confirms this, showing a dense infiltrate of malignant plasma cells (large cells with eccentric nuclei and clock-face chromatin). A hallmark of multiple myeloma is the overproduction of monoclonal light chains. When these small proteins are excreted in the urine, they are known as Bence-Jones proteins. Rouleaux formation (Option B) is actually present in multiple myeloma due to high protein levels causing RBCs to stack like coins. Multiple myeloma is the primary cause of systemic AL (Amyloid Light-chain) amyloidosis, so saying it's absent (Option C) is incorrect. Multiple myeloma causes increased calcium levels (hypercalcemia) due to the osteolytic destruction of bone, not decreased levels (Option D). The "CRAB" mnemonic is essential for this diagnosis: Calcium elevation, Renal insufficiency, Anemia, and Bone lesions.

A patient presents with fatigue, pallor, and weakness. Laboratory tests show low hemoglobin levels with a normal reticulocyte count. What is the most likely diagnosis based on these findings?

(A)

Aplastic Anemia

(B)

Pure Red Cell Aplasia

(C)

Iron Deficiency Anemia

(D)

Hemolytic Anemia

Question 34. 41. (A)Presence of Bence-Jones proteinuria

The clinical picture of a 50-year-old with back pain and a "punched-out" osteolytic lesion is highly suggestive of Multiple Myeloma. The histopathology confirms this, showing a dense infiltrate of malignant plasma cells (large cells with eccentric nuclei and clock-face chromatin). A hallmark of multiple myeloma is the overproduction of monoclonal light chains. When these small proteins are excreted in the urine, they are known as Bence-Jones proteins. Rouleaux formation (Option B) is actually present in multiple myeloma due to high protein levels causing RBCs to stack like coins. Multiple myeloma is the primary cause of systemic AL (Amyloid Light-chain) amyloidosis, so saying it's absent (Option C) is incorrect. Multiple myeloma causes increased calcium levels (hypercalcemia) due to the osteolytic destruction of bone, not decreased levels (Option D). The "CRAB" mnemonic is essential for this diagnosis: Calcium elevation, Renal insufficiency, Anemia, and Bone lesions.

A patient presents with fatigue, pallor, and weakness. Laboratory tests show low hemoglobin levels with a normal reticulocyte count. What is the most likely diagnosis based on these findings?

A. Aplastic Anemia

B. Pure Red Cell Aplasia

C. Iron Deficiency Anemia

D. Hemolytic Anemia

Correct answer: B

Anemia (low Hb) with a normal or low reticulocyte count indicates an "inadequate" response by the bone marrow; the marrow

is failing to produce enough new red cells to compensate for the anemia. In Pure Red Cell Aplasia (PRCA), there is a selective and severe decrease in erythroid precursors in the bone marrow, leading to anemia with a characteristically low reticulocyte count. Aplastic Anemia (Option A) also shows low reticulocytes, but it involves all three cell lines (pancytopenia), not just red cells. Iron Deficiency Anemia (Option C) is usually microcystic and would also show a low reticulocyte count until iron is replaced, but PRCA is a more specific "marrow failure" diagnosis for this clinical description. Hemolytic Anemia (Option D) would show a

Question 35. high reticulocyte count, as the marrow is healthy and frantically trying to replace the cells being destroyed in the periphery. PRCA is famously associated with thymomas and parvovirus B19 infection (especially in patients with sickle cell disease).

Mr. X, a 46-year-old man, presents with lower back pain and dysuria. Laboratory tests show normocytic normochromic anemia and hypercalcemia. Serum protein electrophoresis reveals an M-spike in the gamma region. Which test is most appropriate to confirm the diagnosis of multiple myeloma?

A. Liver function test

B. Bence Jones protein in urine

C. Urine albumin-to-creatinine ratio (UACR) test

D. Heat and acetic acid test

Correct answer: B

This patient presents with the classic symptoms of Multiple Myeloma: back pain (bone lesions), anemia, and hypercalcemia. The finding of an M-spike on serum protein electrophoresis is strongly suggestive of

a
monoclonal
gammopathy. To further support and confirm this diagnosis, testing for Bence Jones protein in the urine is highly appropriate, as it detects the monoclonal free light chains being produced by the malignant plasma cells. Liver function tests (Option A) are generally not helpful for this hematological malignancy. UACR (Option C) is used to monitor diabetic kidney disease, not myeloma. The heat and acetic acid test (Option D) is a general test for proteinuria but is not specific for the monoclonal light chains seen in myeloma. The gold standard for definitive diagnosis would be a bone marrow aspiration and biopsy showing clonal plasma cells. Multiple myeloma is a complex disease requiring
multidisciplinary
management,
including chemotherapy, steroids, and often bone-strengthening agents.

Which of the following is true regarding an increase in Glomerular Filtration Rate (GFR)?

(A)
Increase in the resistance of the afferent arteriole

(B)
Decrease in the resistance of the efferent arteriole

(C)
Increase in Bowman's capsule hydrostatic pressure

(D)
Increase in renal perfusion

Question 36. 43. (B)Bence Jones protein in urine
This patient presents with the classic symptoms of Multiple Myeloma: back pain (bone lesions), anemia, and hypercalcemia. The finding of an M-spike on serum protein electrophoresis is

strongly suggestive of a monoclonal gammopathy. To further support and confirm this diagnosis, testing for Bence Jones protein in the urine is highly appropriate, as it detects the monoclonal free light chains being produced by the malignant plasma cells. Liver function tests (Option A) are generally not helpful for this hematological malignancy. UACR (Option C) is used to monitor diabetic kidney disease, not myeloma. The heat and acetic acid test (Option D) is a general test for proteinuria but is not specific for the monoclonal light chains seen in myeloma. The gold standard for definitive diagnosis would be a bone marrow aspiration and biopsy showing clonal plasma cells. Multiple myeloma is a complex disease requiring multidisciplinary management, including chemotherapy, steroids, and often bone-strengthening agents.

Which of the following is true regarding an increase in Glomerular Filtration Rate (GFR)?

A. Increase in the resistance of the afferent arteriole

B. Decrease in the resistance of the efferent arteriole

C. Increase in Bowman's capsule hydrostatic pressure

D. Increase in renal perfusion

Correct answer: D

The Glomerular Filtration Rate (GFR) is determined by the balance of Starling forces across the glomerular capillaries. An increase in renal perfusion (blood flow to the kidney) increases the hydrostatic pressure within the glomerular capillaries, which directly leads to an

increase in GFR. Increasing the resistance of the afferent arteriole (Option A) would decrease flow and pressure, thus decreasing GFR. Decreasing the resistance of the efferent arteriole (Option B) allows blood to exit the glomerulus more easily, lowering the filtration pressure and decreasing GFR. Increasing Bowman's capsule hydrostatic pressure (Option C)—which might happen in a urinary tract obstruction—opposes filtration and decreases GFR. In essence, GFR is increased by anything that "pushes" more fluid out of

Question 37. the blood and into the capsule, primarily high glomerular capillary pressure. This pressure is regulated by the relative constriction or dilation of the afferent and efferent arterioles, a process known as renal autoregulation.

Which biomarker is the earliest to rise in the event of a myocardial infarction (MI)?

A. CKMB (Creatine Kinase-MB)

B. Troponin

C. LDH

D. Ischemia modified albumin

Correct answer: D

In the evolution of biomarkers for acute coronary syndrome, Ischemia Modified Albumin (IMA) is recognized as one of the earliest markers to rise, often becoming elevated within minutes of the onset of ischemia, even before actual myocardial necrosis occurs. However, it is not very specific. Among the traditional markers of necrosis, Myoglobin is the first to rise (within 1-2 hours). CK-MB (Option A) typically begins to rise at 4-6 hours. Troponins (Option B) are the gold standard for diagnosis due to their extreme specificity but usually take 3-6 hours to become detectable in the blood. LDH (Option C) is a late marker, rising after 24 hours and staying elevated for a week. In modern clinical

practice,
high-sensitivity
troponin
assays
have significantly shortened the "blind spot"
for diagnosis. While IMA is physiologically
the earliest, its lack of specificity means that
Troponin remains the most clinically important
marker for confirming a myocardial infarction
in the emergency department.
Which trisomy is suggested by the karyotyping results showing chromosomal defects?
(A)
Trisomy 18
(B)
Trisomy 13
(C)
Trisomy 21
(D)
Trisomy 11

Question 38. 45. (D)Ischemia modified albumin
In the evolution of biomarkers for acute coronary syndrome, Ischemia Modified Albumin (IMA) is recognized as one of the earliest markers to rise, often becoming elevated within minutes of the onset of ischemia, even before actual myocardial necrosis occurs. However, it is not very specific. Among the traditional markers of necrosis, Myoglobin is the first to rise (within 1-2 hours). CK-MB (Option A) typically begins to rise at 4-6 hours. Troponins (Option B) are the gold standard for diagnosis due to their extreme specificity but usually take 3-6 hours to become detectable in the blood. LDH (Option C) is a late marker, rising after 24 hours and staying elevated for a week. In modern clinical practice,
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for diagnosis. While IMA is physiologically
the earliest, its lack of specificity means that
Troponin remains the most clinically important
marker for confirming a myocardial infarction
in the emergency department.
Which trisomy is suggested by the karyotyping results showing chromosomal defects?
A. Trisomy 18
B. Trisomy 13
C. Trisomy 21
D. Trisomy 11
Correct answer: A
The karyotype shown indicates the presence of an extra chromosome at position 18, confirming Trisomy 18 (Edwards syndrome). Instead of the normal pair, there are three chromosomes in group 18, which is the key diagnostic feature. Trisomy 18 is associated with characteristic clinical features such as low birth weight, micrognathia, prominent occiput, clenched fists with overlapping fingers, rocker-bottom feet, and congenital heart defects. It has a poor prognosis, with most affected infants not surviving beyond the first year.
Why other options are incorrect:
(B) Trisomy 13: Would show three copies of chromosome 13, typically associated with cleft lip/palate and polydactyly.
(C) Trisomy 21: Involves three copies of chromosome 21, with features like flat

Question 39. facies and single palmar crease, which are not indicated here.
A. Subunit aggregation
B. Splicing

C. Poly A tail addition

D. Hydroxylation

Correct answer: D

Hydroxylation is a post-translational modification involving the addition of –OH groups to specific amino acids, and it is considered common across collagen, hemoglobin, and immunoglobulins.

1. In collagen, hydroxylation of proline and lysine is essential for triple-helix stability and tensile strength.
2. In hemoglobin, hydroxylation of certain residues (e.g., histidine) is described in exam contexts as influencing oxygen binding properties.
3. In immunoglobulins, hydroxylation contributes indirectly to proper folding, glycosylation, and structural stability.

Why other options are incorrect:

(A) Subunit aggregation: Seen in hemoglobin and immunoglobulins, but collagen primarily depends on hydroxylation for stability, not just aggregation.

(B) Splicing: A post-transcriptional RNA process, not post-translational.

(C) Poly A tail addition: Also a post-transcriptional modification of mRNA.

Hence, the best common post-translational modification is hydroxylation.

Maximum absorption of water takes place in:

(A)

Proximal convoluted tubule

(B)

Distal convoluted tubule

(C)

Collecting duct

(D)

Loop of henle

Question 40. to concentrate urine, but its absolute volume of water reabsorption is much lower than that of the PCT. Understanding this "bulk flow" in the PCT is essential for pharmacology, as diuretics like acetazolamide work in this segment to block sodium and water recovery, leading to increased urine output.

A patient presents to the outpatient department with a swelling in the thyroid region that moves with swallowing and tongue protrusion. The swelling has ruptured, resulting in pus discharge. What is the preferred treatment for this condition?

A. Sistrunk procedure

B. Antibiotics

C. Incision and drainage

D. None of the above

Correct answer: A

A midline neck swelling that moves with both deglutition (swallowing) and protrusion of the tongue is the classic clinical presentation of a thyroglossal cyst. This cyst forms along the path of the thyroglossal duct, which is the embryological track the thyroid gland takes from the base of the tongue to its final position in the neck. Even if the cyst has become infected or ruptured (forming a thyroglossal fistula), the definitive and preferred treatment is the Sistrunk procedure. This surgery involves removing the

entire cyst, the entire thyroglossal duct track, and the central portion of the hyoid bone to ensure the entire embryological remnant is excised, which minimizes the risk of recurrence. Antibiotics (Option B) or simple incision and drainage (Option C) may be used to manage an acute abscess, but they are not the definitive treatment and will almost certainly lead to the formation of a chronic fistula if the duct is not removed.

A 45-year-old patient presents to the outpatient department with weakness and fatigue. Laboratory tests reveal low hemoglobin and a low reticulocyte count, while white blood cell and platelet counts are normal. Bone marrow examination shows a selective decrease in erythroid precursors. Based on these findings, what is the most likely diagnosis?

(A)
Aplastic anemia

(B)
Pure red cell aplasia

(C)
Iron deficiency anemia

(D)
Hemolytic anemia

Question 41. 49. (A)Sistrunk procedure
A midline neck swelling that moves with both deglutition (swallowing) and protrusion of the tongue is the classic clinical presentation of a thyroglossal cyst. This cyst forms along the path of the thyroglossal duct, which is the embryological track the thyroid gland takes from the base of the tongue to its final position in the neck. Even if the cyst has become infected or ruptured (forming a thyroglossal fistula), the definitive and preferred treatment is the Sistrunk procedure. This surgery involves removing the entire cyst, the entire thyroglossal duct track, and the central portion of the hyoid bone to ensure the entire embryological remnant is

excised, which minimizes the risk of recurrence. Antibiotics (Option B) or simple incision and drainage (Option C) may be used to manage an acute abscess, but they are not the definitive treatment and will almost certainly lead to the formation of a chronic fistula if the duct is not removed.

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A. Aplastic anemia

B. Pure red cell aplasia

C. Iron deficiency anemia

D. Hemolytic anemia

Correct answer: B

As established in Question 42, the combination of anemia (low Hb), an inadequate bone marrow response (low reticulocyte count), and normal WBC/platelet counts strongly points to a specific marrow failure. The definitive histological finding of a selective decrease in Erythroid precursors in the bone marrow confirms the diagnosis of Pure Red Cell Aplasia (PRCA). Aplastic anemia (Option A) would show a decrease in all cell lines (pancytopenia) and a "fatty" marrow. Iron deficiency anemia (Option C) would typically show microcytosis and absent iron stores, but not a total selective absence of red cell precursors. Hemolytic anemia (Option D) would show a high reticulocyte count as the marrow tries to compensate. PRCA can be congenital (Diamond-Blackfan anemia) or acquired. Acquired PRCA is often

Question 42. an autoimmune condition and is famously associated with thymomas; surgical removal of

the thymoma can sometimes result in remission of the anemia. This selective failure is a high-yield concept in hematology.

A young woman presents with recurrent headaches, easy bruising, and episodes of visual blurring. Laboratory tests show an elevated platelet count, while red blood cell and white blood cell counts are normal. What is the most likely diagnosis?

A. Essential Thrombocytosis

B. Polycythemia Vera

C. Chronic Myeloid Leukemia (CML)

D. Acute Myeloid Leukemia (AML)

Correct answer: A

This clinical scenario describes Essential Thrombocytosis (ET), a myeloproliferative neoplasm characterized by a sustained elevation in the platelet count and a tendency for both thrombotic and hemorrhagic complications.

The patient's symptoms of recurrent headaches and visual blurring are common manifestations of microvascular occlusion caused by excessive platelets. Easy bruising occurs despite high platelet counts because the platelets may be functionally defective or cause acquired von Willebrand syndrome. In ET, the red blood cell and white blood cell counts typically remain within normal limits, which distinguishes it from other myeloproliferative disorders like Polycythemia Vera, where red cells are elevated, or Chronic Myeloid Leukemia, where white cells are markedly increased. Diagnosis often requires identifying characteristic mutations in JAK2, CALR, or MPL genes. Management focuses on reducing the risk of thrombosis using antiplatelet agents like aspirin or cytoreductive therapy in high-risk patients.

What does the given pedigree chart indicate?

(A)

Autosomal Dominant (AD)

(B)

Autosomal Recessive (AR)

(C)

Mitochondrial Disorder

(D)

X-linked Recessive (XLR)

Question 43. 51. (A) Essential Thrombocytosis
This clinical scenario describes Essential Thrombocytosis (ET), a myeloproliferative neoplasm characterized by a sustained elevation in the platelet count and a tendency for both thrombotic and hemorrhagic complications.
The patient's symptoms of recurrent headaches and visual blurring are common manifestations of microvascular occlusion caused by excessive platelets. Easy bruising occurs despite high platelet counts because the platelets may be functionally defective or cause acquired von Willebrand syndrome. In ET, the red blood cell and white blood cell counts typically remain within normal limits, which distinguishes it from other myeloproliferative disorders like Polycythemia Vera, where red cells are elevated, or Chronic Myeloid Leukemia, where white cells are markedly increased. Diagnosis often requires identifying characteristic mutations in JAK2, CALR, or MPL genes. Management focuses on reducing the risk of thrombosis using antiplatelet agents like aspirin or cytoreductive therapy in high-risk patients.
What does the given pedigree chart indicate?

A. Autosomal Dominant (AD)

B. Autosomal Recessive (AR)

C. Mitochondrial Disorder

D. X-linked Recessive (XLR)

Correct answer: C

The pedigree shows a pattern where an affected mother transmits the condition to

all her children, regardless of sex. In the first generation, the affected female has multiple children, and all of them are affected. This is a hallmark feature of mitochondrial inheritance, as mitochondria are inherited exclusively from the mother.

In the next generation, an affected male does not transmit the disease to any of his children, which further confirms mitochondrial inheritance, since fathers do not pass mitochondrial DNA to offspring.

Why other options are incorrect:

(A) Autosomal Dominant (AD): Would show transmission from both males and females equally, including father-to-child transmission.

Question 44. 53. (A) DNA Editing

CRISPR-Cas9 is a revolutionary and highly precise technology used for DNA Editing. It is derived from a natural defense mechanism used by bacteria to fight off viral infections. The system consists of two primary components: the Cas9 enzyme, which acts like a pair of "molecular scissors" to cut DNA at a specific location, and a guide RNA (gRNA), which ensures the scissors cut in the exact right place. Once the DNA is cut, the cell's natural repair mechanisms can be harnessed to delete, add, or replace genetic material. This technology has

immense potential in treating genetic disorders, improving crop yields, and advancing basic biological research. It is distinct from post-transcriptional modifications, which occur to RNA after it has been synthesized. While "DNA Editing Solution" might sound similar, the core scientific application is the act of editing the genome itself.

A patient with pneumonia provides a bronc ho alveolar lavage (BAL) sample, as shown below. Which pathogen is most likely responsible, and what is the appropriate management for this infection?

A. Mucormycosis, Terbinafin

B. Aspergillus, Amphotericin B

C. Pneumocystis Carinii, Cotrimoxazole

D. Candida, Itraconazole

Correct answer: C

The Bronchoalveolar Lavage (BAL) image displays characteristic flattened or "crushed-ping-pong-ball" shaped cysts, which are diagnostic for Pneumocystis jirovecii (formerly known as Pneumocystis carinii). This fungus is a significant cause of opportunistic pneumonia in immunocompromised patients, particularly those with HIV/AIDS or those on chronic immunosuppression. The standard and most effective management for this infection is Cotrimoxazole (Trimethoprim-Sulfamethoxazole).

Mucormycosis (Option

A) typically presents with broad, non-septate hyphae and requires surgical debridement and Amphotericin B. Aspergillus (Option B) shows septate hyphae with acute-angle branching.

Question 45. Candida (Option C) usually appears as budding yeast and pseudohyphae. Clinical presentation often includes progressive exertional dyspnea, non-productive cough, and fever. In severe cases with significant hypoxia, corticosteroids are added to the antibiotic regimen to reduce the inflammatory response in the lungs. Early diagnosis via BAL and prompt treatment are essential to improve survival.

Which of the following is the most effective enzyme in Acute inflammation?

A. NADPH oxidase

B. Defensin

C. Catalase

D. MPO

Correct answer: D

In the context of the respiratory burst during acute inflammation, Myeloperoxidase (MPO) is considered the most effective bactericidal enzyme within neutrophils. During the inflammatory response, NADPH oxidase (Option A) initiates the burst by converting oxygen into superoxide radicals. MPO then takes the hydrogen peroxide produced from this reaction and, in the presence of chloride ions, converts it into hypochlorous acid (HOCl). HOCl is the active ingredient in household bleach and is a potent oxidant that rapidly destroys bacteria by disrupting their cell membranes and proteins. Defensins (Option B) are antimicrobial peptides that form pores in bacterial membranes but are not enzymes. Catalase (Option C) is an antioxidant enzyme that actually breaks down hydrogen peroxide into water and oxygen, thereby limiting the

inflammatory damage. Therefore, while several enzymes participate, MPO is the primary engine for the generation of the most lethal microbicidal substances during acute inflammation.

Which of the following parameters is decreased in acute inflammation?

(A)

CRP

(B)

Hepcidin

(C)

Ferritin

(D)

Albumin

Question 46. 55. (D) MPO

In the context of the respiratory burst during acute inflammation, Myeloperoxidase (MPO) is considered the most effective bactericidal enzyme within neutrophils. During the inflammatory response, NADPH oxidase (Option A) initiates the burst by converting oxygen into superoxide radicals. MPO then takes the hydrogen peroxide produced from this reaction and, in the presence of chloride ions, converts it into hypochlorous acid (HOCl). HOCl is the active ingredient in household bleach and is a potent oxidant that rapidly destroys bacteria by disrupting their cell membranes and proteins. Defensins (Option B) are antimicrobial peptides that form pores in bacterial membranes but are not enzymes. Catalase (Option C) is an antioxidant enzyme that actually breaks down hydrogen peroxide into water and oxygen, thereby limiting the inflammatory damage. Therefore, while several enzymes participate, MPO is the primary engine for the generation of the most lethal microbicidal substances during acute inflammation.

Which of the following parameters is decreased in acute inflammation?

A. CRP

B. Hepcidin

C. Ferritin

D. Albumin

Correct answer: D

Acute inflammation triggers the liver to change its protein production, leading to increases in "positive" acute-phase reactants and decreases in "negative" acute-phase reactants. Albumin is a classic negative acute-phase reactant, meaning its serum levels decrease during significant inflammation. This occurs because the liver shifts its synthetic machinery toward producing protective proteins and because of increased capillary permeability. Conversely, C-reactive protein (CRP) (Option A), Ferritin (Option C), and Hepcidin (Option B) are all positive acute-phase reactants that increase significantly. CRP is used clinically as a sensitive marker for systemic inflammation. Increased Hepcidin levels lead to

Question 47. 57. (C) < 200

Kaposi's sarcoma (KS) is an AIDS-defining illness caused by Human Herpesvirus 8 (HHV-8). In patients with HIV, it typically presents when the immune system is significantly compromised, characterized by a CD4 count below 200 cells/mm³. While it can occasionally occur at higher CD4 counts, the risk and severity increase dramatically as the count drops below this threshold. KS manifests as violaceous, non-blanching macules, plaques, or nodules on the skin, mucous membranes, or internal organs. Higher CD4 ranges like 200-350 (Option B) or (Option D) are associated with lower risks for most opportunistic infections and malignancies. The introduction of Highly Active Antiretroviral Therapy (HAART) has significantly reduced

the incidence of KS by allowing patients to maintain higher CD4 counts and suppress HIV viral loads. Treatment of KS in HIV patients primarily focuses on immune reconstitution through HAART, though local therapies or systemic chemotherapy may be required for extensive disease.

Which of the following is the diagnostic test for carcinoid tumors?

A. 24-hour urinary catecholamines

B. Serum calcitonin levels

C. Serum chromogranin A

D. Urinary 5-hydroxyindoleacetic acid

Correct answer: D

Carcinoid tumors are neuroendocrine neoplasms that can secrete excessive amounts of serotonin. The most definitive diagnostic screen for carcinoid syndrome is measuring 24-hour urinary 5-hydroxyindoleacetic acid (5-HIAA) levels. 5-HIAA is the primary end-metabolite of serotonin. For accurate results, patients must avoid serotonin-rich foods like bananas, walnuts, and pineapples before the test. 24-hour urinary catecholamines (Option A) are used to diagnose pheochromocytoma. Serum calcitonin (Option B) is a marker for medullary thyroid carcinoma. Serum chromogranin A (Option C) is a useful general marker for neuroendocrine tumors but is less specific for the carcinoid syndrome than

Question 48. urinary 5-HIAA. Carcinoid syndrome typically presents with flushing, diarrhea, and wheezing, often occurring only after the tumor has metastasized to the liver. Imaging studies like OctreoScan or Ga-68 DOTATATE PET/CT are used to localize the primary tumor and assess

the extent of metastasis.

An adult patient presents with fever and right-sided chest pain and is found to have a moderate right-sided pleural effusion. Diagnostic thoracocentesis reveals a straw-colored exudate with 50 mg% glucose and lymphocytic predominance. ADA levels are borderline. Which investigation is most likely to confirm a diagnosis of tuberculosis in this case?

A. Needle Biopsy of the Pleura

B. Pleural Fluid Xpert MTB/RIF assay

C. Pleural Fluid AFB smear

D. Pleural Fluid AFB-culture

Correct answer: B

The patient has features suggestive of tuberculous pleural effusion—straw-colored exudate, lymphocytic predominance, and low glucose. Although ADA is borderline, TB still remains a strong possibility.

The Pleural Fluid Xpert MTB/RIF assay is the most appropriate next investigation because it is a rapid molecular test (PCR-based) that detects Mycobacterium tuberculosis DNA and also identifies rifampicin resistance. It has higher sensitivity and specificity than smear and provides quick results, making it clinically very useful.

Why other options are incorrect:

(A) Needle biopsy of pleura: More invasive; though diagnostic, it is not first-line and reserved if less invasive tests fail.

(C) Pleural fluid AFB smear:Very low sensitivity due to low bacillary load.

(D) Pleural fluid AFB culture: Gold standard but takes weeks, delaying diagnosis and treatment.

Thus, the best confirmatory and practical test
here is Xpert MTB/RIF assay.
Which of the following is associated with conjugated hyperbilirubinemia?
(A)
Crigler Najar -1 syndrome
(B)
Crigler Najar -2 syndrome
(C)
Gilbert syndrome
(D)
Dubin Johnson syndrome

Question 49. UDP-glucuronosyltransferase (UGT1A1), which is responsible for the conjugation process itself. Gilbert syndrome is the most common and mildest form, often appearing as transient jaundice during stress or fasting. Understanding whether jaundice is conjugated or unconjugated is a critical first step in narrowing the differential diagnosis for any patient with elevated bilirubin levels.
An alcoholic patient presents with lower back pain and fever and reports previous similar episodes associated with elevated serum amylase. What type of necrosis is most likely present in this condition?
A. Fibrinoid necrosis
B. Fat necrosis
C. Coagulative necrosis
D. Liquefactive necrosis
Correct answer: B
The patient's history of chronic alcoholism, recurrent back pain, and previously elevated amylase levels strongly indicates chronic pancreatitis with an acute flare. In

acute pancreatitis, the release of activated pancreatic enzymes, particularly lipases, leads to the destruction of adipose tissue in the peripancreatic area and the omentum. This specific process is called fat necrosis. The released fatty acids combine with calcium to form visible white, chalky deposits, a process known as saponification. Fibrinoid necrosis (Option A) is typically seen in blood vessels during severe hypertension or vasculitis. Coagulative necrosis (Option C) is characteristic of ischemic injury in most solid organs like the heart or kidney. Liquefactive necrosis (Option D) is classic for brain infarcts or bacterial abscesses. Fat necrosis is a pathognomonic finding for pancreatic injury and is a major contributor to the hypocalcemia sometimes seen in severe pancreatitis cases due to the "trapping" of calcium in necrotic fat.

Which substance is involved in the conjugation process in the liver?

(A)
Hyaluronic Acid

(B)
Glucuronic Acid

(C)
Gluconic Acid

(D)
Glycolic Acid

Question 50. 61. (B) Fat necrosis

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elevated amylase levels strongly indicates chronic pancreatitis with an acute flare. In acute pancreatitis, the release of activated pancreatic enzymes, particularly lipases, leads to the destruction of adipose tissue in the peripancreatic area and the omentum. This specific process is called fat necrosis. The released fatty acids combine with calcium to form visible white, chalky deposits, a process known as saponification. Fibrinoid necrosis (Option A) is typically seen in blood vessels during severe hypertension or vasculitis. Coagulative necrosis (Option C) is characteristic of ischemic injury in most solid organs like the heart or kidney. Liquefactive necrosis (Option D) is classic for brain infarcts or bacterial abscesses. Fat necrosis is a pathognomonic finding for pancreatic injury and is a major contributor to the hypocalcemia sometimes seen in severe pancreatitis cases due to the "trapping" of calcium in necrotic fat.

Which substance is involved in the conjugation process in the liver?

A. Hyaluronic Acid

B. Glucuronic Acid

C. Gluconic Acid

D. Glycolic Acid

Correct answer: B

The liver performs conjugation to make various endogenous and exogenous substances more water-soluble for easier excretion. The most significant substance involved in this Phase II metabolic process is glucuronic acid. Through the action of the enzyme UDP-glucuronosyltransferase (UGT), glucuronic

acid is attached to molecules like bilirubin, steroid hormones, and many drugs. Hyaluronic acid (Option A) is a major component of the extracellular matrix in connective tissues. Gluconic acid (Option B) and glycolic acid (Option D) are organic acids that are not the primary agents used for hepatic conjugation. Efficient glucuronidation is vital for detoxifying

Question 51. the body; for example, the conjugation of bilirubin is essential to prevent kernicterus in newborns and chronic jaundice in adults. This biochemical pathway is a cornerstone of clinical pharmacology and toxicology, as many drug-drug interactions occur because different medications compete for the same glucuronidation pathways in the liver.

Which substance inhibits the iron transporter on the basal side of the enterocyte?

A. Hepcidin

B. Ferritin

C. Transferrin

D. Ferroportin

Correct answer: A

Iron homeostasis is primarily regulated by hepcidin, a peptide hormone produced by the liver. Hepcidin controls iron levels by binding to and triggering the internalisation and degradation of ferroportin (Option D). Ferroportin is the only known iron exporter, located on the basolateral (basal) membrane of enterocytes and on macrophages. By inhibiting ferroportin, hepcidin prevents iron from entering the bloodstream, effectively lowering serum iron levels. Ferritin (Option B) is the primary intracellular storage protein for iron. Transferrin (Option C) is the primary transport protein that carries iron through the blood. During inflammation, hepcidin levels

rise as an acute-phase reactant, leading to the sequestration of iron and the development of "anemia of chronic disease". Conversely, in hereditary hemochromatosis, hepcidin levels are inappropriately low, leading to excessive iron absorption and systemic iron overload. This molecular switch is the master regulator of body iron stores.

Which substance is used as an additive in a blood collection tube specifically for measuring blood alcohol concentration?

(A)

Heparin + EDTA

(B)

Sodium fluoride + Potassium dichromate

(C)

Heparin

(D)

Sodium citrate

Question 52. 63. (A) Hepcidin

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Which substance is used as an additive in a blood collection tube specifically for measuring blood alcohol concentration?

A. Heparin + EDTA

B. Sodium fluoride + Potassium dichromate

C. Heparin

D. Sodium citrate

Correct answer: B

For forensic and clinical measurement of blood alcohol concentration, specific preservatives are required to ensure the sample's integrity. The standard additives are sodium fluoride and potassium dichromate. Sodium fluoride acts as an antiglycolytic agent and enzyme inhibitor, preventing bacteria or yeast from fermenting glucose into alcohol post-collection, which would lead to a falsely elevated result. Potassium dichromate acts as a preservative to prevent the degradation of existing alcohol. Heparin (Option C) and EDTA (Option A) are common anticoagulants used for general chemistry and hematology but do not prevent post-mortem fermentation. Sodium citrate (Option D) is

Question 53. used for coagulation studies. Using the correct collection tube is vital in legal cases, such as "drunk driving" investigations, where the accuracy of the blood alcohol level is a critical piece of evidence. Failure to use these specific preservatives can lead to the evidence being successfully challenged in court.

Which drug is used to test for Myasthenia Gravis?

A. Pyridostigmine

B. Neostigmine

C. Edrophonium

D. Atropine

Correct answer: C

Edrophonium is a short-acting acetylcholinesterase inhibitor used in the Tensilon test to diagnose Myasthenia Gravis (MG). In patients with MG, who have a deficiency of functional acetylcholine receptors at the neuromuscular junction, edrophonium briefly increases the amount of available acetylcholine, leading to a rapid, temporary improvement in muscle strength (e.g., resolution of ptosis). Its rapid onset and very short duration of action (minutes) make it ideal for this diagnostic test. Pyridostigmine (Option A) and Neostigmine (Option B) are longer-acting inhibitors used for the treatment of MG, not typically for the initial diagnosis. Atropine (Option D) is a muscarinic antagonist used to counteract the cholinergic side effects (like bradycardia or salivation) that can occur during the edrophonium test. While the Tensilon test has largely been replaced by antibody testing and electromyography (SFEMG), it remains a classic pharmacological principle for understanding the pathophysiology of the neuromuscular junction.

What is the mechanism of action (MOA) of Rivaroxaban?

(A)

Inhibition of thrombin (Factor IIa)

(B)

Inhibition of Factor Xa

(C)

Activation of antithrombin III

(D)

Inhibition of platelet aggregation

Question 54. 65. (C) Edrophonium

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A. Inhibition of thrombin (Factor IIa)

B. Inhibition of Factor Xa

C. Activation of antithrombin III

D. Inhibition of platelet aggregation

Correct answer: B

Rivaroxaban belongs to a class of medications known as Direct Oral Anticoagulants (DOACs) that work by directly inhibiting Factor Xa. Factor Xa is a critical enzyme at the convergence of the intrinsic and extrinsic pathways, responsible for

the "thrombin burst" that converts prothrombin to thrombin. By blocking Factor Xa, Rivaroxaban effectively prevents blood clot formation. Inhibition of thrombin (Factor IIa) (Option A) is the mechanism for drugs like Dabigatran. Activation of antithrombin III (Option C) is how heparin and its derivatives function. Inhibition of platelet aggregation (Option D) describes antiplatelet drugs like aspirin or clopidogrel. Rivaroxaban is commonly used for the prevention of stroke in atrial fibrillation and

Question 55. for the treatment of deep vein thrombosis (DVT) and pulmonary embolism (PE). Its advantages over warfarin include a rapid onset, a predictable dose-response, and the lack of a need for routine blood monitoring (PT/INR).

A 60-year-old woman with type 2 diabetes mellitus develops vaginal candidiasis. Which antidiabetic (hypoglycemic) agent should be avoided in this patient?

A. Acarbose

B. Metformin

C. Gliflozins

D. Linagliptin

Correct answer: C

Gliflozins (SGLT2 inhibitors), such as canagliflozin or empagliflozin, work by inhibiting glucose reabsorption in the proximal tubules of the kidney, leading to glycosuria (glucose in the urine). While effective for blood sugar control and providing cardiovascular

benefits,
the
increased
urinary
glucose
concentration promotes the growth of fungi. Therefore, a major and common side effect of Gliflozins is an increased risk of genitourinary infections, particularly vaginal candidiasis and urinary tract infections. In a patient already suffering from candidiasis, these drugs should be avoided as they will likely exacerbate the infection. Acarbose (Option A), Metformin (Option B), and Linagliptin (Option D) do not cause glycosuria and are not associated with an increased risk of fungal infections. Clinical management requires weighing the significant renal and cardiac benefits of SGLT2 inhibitors against the risk of recurrent infections, often necessitating counseling on proper hygiene and prompt treatment of any symptomatic episodes.
Which drug is known to cause hand-foot syndrome?
(A)
Capecitabine
(B)
Cyclophosphamide
(C)
Gemcitabine
(D)
Paclitaxel

Question 56. 67. (C) Gliflozins
Gliflozins
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such
as
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or
empagliflozin,
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Which drug is known to cause hand-foot syndrome?

A. Capecitabine

B. Cyclophosphamide

C. Gemcitabine

D. Paclitaxel

Correct answer: A

Hand-foot
syndrome
(palmar-plantar

erythrodysesthesia)
is
a
distinctive
dermatological
side
effect
most
strongly
associated with Capecitabine and 5-fluorouracil
(5-FU) infusions. Capecitabine is an oral
prodrug of 5-FU used in the treatment of
colorectal and breast cancers. The syndrome is
characterized by redness, swelling, numbness,
and pain on the palms of the hands and soles
of the feet, which can progress to blistering and
peeling. It is thought to be caused by the leakage
of the drug from small capillaries in these
pressure-bearing
areas.
Cyclophosphamide
(Option B) is more famously associated with
hemorrhagic cystitis. Gemcitabine (Option
C) and Paclitaxel (Option D) have different
toxicity profiles, though paclitaxel frequently
causes peripheral neuropathy. Management of

Question 57. hand-foot syndrome involves dose reduction or interruption of the chemotherapy and symptomatic care with topical urea-based creams and avoidance of heat or friction on the affected areas.

Which of the following is the half-life of lithium?

A. 8 hours

B. 12 hours

C. 24 hours

D. 48 hours

Correct answer: C

Lithium is a widely used mood stabilizer in the management of bipolar disorder. In adults with normal renal function, lithium has an average elimination half-life of approximately 24 hours. Because a drug typically requires about 4–5 half-lives to reach steady-state levels, lithium concentrations usually stabilize after 4–5 days of regular dosing. This is why serum lithium levels are generally checked after 5 days of initiating therapy or changing the dose.
Lithium is excreted entirely by the kidneys, and its half-life can be prolonged in certain situations—up to 36 hours or more in elderly patients or those with renal impairment. Therefore, renal function has a major impact on lithium pharmacokinetics.
Options A (8 hours) and B (12 hours) are too short, while Option D (48 hours) is longer than the typical half-life in healthy adults.
Because lithium has a narrow therapeutic index (≈0.6–1.2 mEq/L), regular serum level monitoring is essential to avoid toxicity, which can manifest as tremor, ataxia, confusion, seizures, or coma.
Which of the following drugs is used in GERD?
(A)
Ondansetron
(B)
Domperidone
(C)
Loperamide
(D)
Diphenoxylate

Question 58. 69. (C) 24 hours
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Which of the following drugs is used in GERD?
A. Ondansetron
B. Domperidone
C. Loperamide
D. Diphenoxylate
Correct answer: B
Gastroesophageal Reflux Disease (GERD) is managed primarily with drugs that reduce gastric acid secretion and, in selected patients, with agents that improve gastrointestinal motility. Domperidone is a dopamine D_2-receptor antagonist that acts as a prokinetic agent.
Domperidone increases the tone

of
the lower esophageal sphincter (LES) and enhances gastric emptying, thereby reducing the likelihood of gastric contents refluxing into the esophagus. For this reason, it is commonly used as an adjunct therapy in GERD, especially in patients with associated delayed gastric emptying or persistent symptoms despite acid suppression.

Question 59. Ondansetron (Option A) is a 5-HT_3 antagonist used to treat nausea and vomiting and has no role in GERD.
Loperamide (Option C) and diphenoxylate (Option D) are antidiarrheal agents that slow intestinal motility and do not treat reflux; they may even worsen symptoms by delaying gastric emptying.
Although proton pump inhibitors (PPIs) remain the mainstay of GERD treatment, domperidone is the correct choice among the options given for managing GERD.
Which of the following is the best drug to reduce LDL cholesterol levels?
A. Niacin
B. Fibrates
C. Statins
D. Resins
Correct answer: C
Statins (HMG-CoA reductase inhibitors), such as atorvastatin or rosuvastatin, are the most effective and first-line medications for reducing LDL cholesterol (the "bad" cholesterol). They work by inhibiting the rate-limiting enzyme in cholesterol synthesis, leading to an upregulation of LDL receptors on hepatocytes and increased clearance of LDL from the blood. High-intensity statins can reduce LDL levels by or more. Niacin (Option A) is more effective at raising HDL

but has significant side effects like flushing. Fibrates (Option B) are the preferred drugs for reducing triglycerides but have only a modest effect on LDL. Bile acid resins (Option D) do reduce LDL but are less potent than statins and often cause significant gastrointestinal side effects. Extensive clinical trials have proven that statins significantly reduce the risk of major cardiovascular events like heart attacks and strokes, making them a cornerstone of preventive cardiology for patients with high cardiovascular risk.

Which of the following is the preferred treatment for Plasmodium falciparum malaria?

(A)

Chloroquine

(B)

Artemisinin-based combination therapy (ACT)

(C)

Primaquine

(D)

Doxycycline

Question 60. 71. (C) Statins

Statins (HMG-CoA reductase inhibitors), such as atorvastatin or rosuvastatin, are the most effective and first-line medications for reducing LDL cholesterol (the "bad" cholesterol). They work by inhibiting the rate-limiting enzyme in cholesterol synthesis, leading to an upregulation of LDL receptors on hepatocytes and increased clearance of LDL from the blood. High-intensity statins can reduce LDL levels by or more. Niacin (Option A) is more effective at raising HDL but has significant side effects like flushing. Fibrates (Option B) are the preferred drugs for reducing triglycerides but have only a modest effect on LDL. Bile acid resins (Option D) do reduce LDL but are less potent than statins

and often cause significant gastrointestinal side effects. Extensive clinical trials have proven that statins significantly reduce the risk of major cardiovascular events like heart attacks and strokes, making them a cornerstone of preventive cardiology for patients with high cardiovascular risk.

Which of the following is the preferred treatment for Plasmodium falciparum malaria?

A. Chloroquine

B. Artemisinin-based combination therapy (ACT)

C. Primaquine

D. Doxycycline

Correct answer: B

(ACT)

Due to widespread resistance, chloroquine (Option A) is no longer effective for most cases of P. falciparum. The current global and WHO standard for treating uncomplicated P. falciparum malaria is Artemisinin-based combination therapy (ACT). This involves pairing a rapid-acting artemisinin derivative (like artemether) with a longer-acting partner drug (like lumefantrine). This dual approach ensures rapid clearance of parasites and prevents the development of further resistance.

Question 61. Primaquine (Option C) is primarily used to clear the dormant liver stages (hypnozoites) of P. vivax and P. ovale and should be avoided in P. falciparum unless as a single dose to reduce gametocyte transmission. Doxycycline (Option D) is used for malaria prophylaxis or as an adjunct in severe cases, but not as the primary treatment for uncomplicated falciparum

malaria. Prompt diagnosis with a rapid test or microscopy and immediate initiation of ACT are life-saving, as falciparum malaria can rapidly progress to severe, fatal complications if left untreated.

Which anticancer drug is used in the treatment of both Gastrointestinal Stromal Tumors (GIST) and Chronic Myeloid Leukemia (CML)?

A. Imatinib

B. Methotrexate

C. Doxorubicin

D. Cisplatin

Correct answer: A

Imatinib is a breakthrough targeted therapy that works as a tyrosine kinase inhibitor. It was specifically designed to inhibit the BCR-ABL fusion protein found in Chronic Myeloid Leukemia (CML), which is created by the "Philadelphia chromosome" translocation.

Additionally, Imatinib is the standard treatment for Gastrointestinal Stromal Tumors (GIST) because it inhibits the c-KIT and PDGF receptor tyrosine kinases that drive these tumors. This drug revolutionized the treatment of CML, turning what was once a fatal disease into a manageable chronic condition. Methotrexate (Option B) is an antimetabolite used for many cancers and autoimmune diseases. Doxorubicin (Option C) is an anthracycline that works by DNA intercalation. Cisplatin (Option D) is a platinum-based alkylating agent. Imatinib's success paved the way for the development of many other targeted "small molecule" inhibitors, which focus on specific genetic mutations in cancer cells while sparing normal tissue, significantly reducing side effects compared to traditional chemotherapy.

Which drug can be used to treat both HIV and Hepatitis B?

(A)

Dolutegravir

(B)

Tenofovir

(C)

Zidovudine

(D)

Ritonavir

Question 62. 73. (A) Imatinib

Imatinib is a breakthrough targeted therapy that works as a tyrosine kinase inhibitor. It was specifically designed to inhibit the BCR-ABL fusion protein found in Chronic Myeloid Leukemia (CML), which is created by the "Philadelphia chromosome" translocation.

Additionally, Imatinib is the standard treatment for Gastrointestinal Stromal Tumors (GIST) because it inhibits the c-KIT and PDGF receptor tyrosine kinases that drive these tumors. This drug revolutionized the treatment of CML, turning what was once a fatal disease into a manageable chronic condition. Methotrexate (Option B) is an antimetabolite used for many cancers and autoimmune diseases. Doxorubicin (Option C) is an anthracycline that works by DNA intercalation. Cisplatin (Option D) is a platinum-based alkylating agent. Imatinib's success paved the way for the development of many other targeted "small molecule" inhibitors, which focus on specific genetic mutations in cancer cells while sparing normal tissue, significantly reducing side effects compared to traditional chemotherapy.

Which drug can be used to treat both HIV and Hepatitis B?

A. Dolutegravir

B. Tenofovir

C. Zidovudine

D. Ritonavir

Correct answer: B

Tenofovir (available as TDF or TAF) is a nucleotide reverse transcriptase inhibitor (NRTI) that is highly effective against both the Human Immunodeficiency Virus (HIV) and the Hepatitis B virus (HBV). It is a foundational component of modern antiretroviral therapy (ART) for HIV and is also considered a first-line treatment for chronic Hepatitis B due to its high potency and low risk of resistance.

Question 63. Lamivudine and Emtricitabine also cover both viruses, making them useful in co-infected patients. Dolutegravir (Option A) is a highly effective integrase inhibitor but only works against HIV. Zidovudine (Option C) is an older HIV medication with no activity against HBV. Ritonavir (Option D) is a protease inhibitor primarily used as a "booster" to increase the levels of other HIV drugs. In patients co-infected with HIV and HBV, it is essential to use a regimen that targets both viruses to prevent HBV "flares" if treatment is interrupted or the HBV develops resistance.

Which of the following anti-tubercular drugs is associated with visual disturbances?

A. Rifampicin

B. Streptomycin

C. Pyrazinamide

D. Ethambutol

Correct answer: D

Ethambutol is a key component of the standard

four-drug regimen for tuberculosis. Its most significant and characteristic side effect is optic neuritis, which leads to visual disturbances. This typically manifests as a decrease in visual acuity and an inability to distinguish between red and green (red-green color blindness). This toxicity is dose-dependent and usually reversible if the drug is stopped early. Rifampicin (Option A) famously causes an orange-red discoloration of body fluids. Streptomycin (Option B) is an aminoglycoside associated with ototoxicity (hearing loss) and nephrotoxicity. Pyrazinamide (Option C) can cause hyperuricemia and gout. Because of the risk of optic nerve damage, patients starting ethambutol should have a baseline visual acuity and color vision test and should be counseled to immediately report any changes in their vision. It is generally avoided in children who are too young to accurately report such visual changes.

Which of the following drugs is most commonly used for daycare surgery or total intravenous anesthesia (TIVA)?

(A)

Sodium thiopentone

(B)

Propofol

(C)

Halothane

(D)

Ketamine

Question 64. 75. (D) Ethambutol

Ethambutol is a key component of the standard four-drug regimen for tuberculosis. Its most significant and characteristic side effect is optic neuritis, which leads to visual disturbances. This typically manifests as a decrease in visual acuity and an inability to distinguish between red and

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A. Sodium thiopentone

B. Propofol

C. Halothane

D. Ketamine

Correct answer: B

Propofol is the most common drug used for induction and maintenance in day-care surgery and Total Intravenous Anesthesia (TIVA). It is favored because it provides rapid induction and, more importantly, a very rapid and clear-headed recovery, which is essential for allowing patients to go home on the same day as their procedure. Propofol also has built-in anti-emetic properties, reducing the risk of postoperative nausea and vomiting. Sodium thiopentone (Option A) has a slower clearance and can cause a more prolonged "hangover" effect. Halothane

Question 65. (Option C) is an older volatile anesthetic rarely used in modern day-care settings. Ketamine (Option D) can cause dissociative side effects

and emergence delirium, making it less ideal for routine day-care procedures. Propofol's distinctive milky appearance (due to its lipid emulsion formulation) is a classic visual identifier in the operating room. Its main drawbacks are pain on injection and the potential for significant respiratory and cardiovascular depression, requiring careful monitoring by an anesthesiologist.

A patient receiving antitubercular therapy (ATT) develops visual disturbances. Which ATT drug is most likely responsible for this adverse effect?

A. Rifampicin

B. Streptomycin

C. Ethambutol

D. Pyrazinamide

Correct answer: C

This question reinforces the high-yield pharmacological principle detailed in Question 75. Among the first-line antitubercular drugs, Ethambutol is well-known for causing optic neuritis, leading to visual problems such as decreased acuity and red-green color blindness. Rifampicin (Option A) affects the liver and causes red fluid discoloration. Streptomycin (Option B) targets the eighth cranial nerve, causing hearing loss and balance issues. Pyrazinamide (Option D) is most associated with liver toxicity and joint pain due to high uric acid. The ocular toxicity of Ethambutol is often related to the total cumulative dose. It is vital for clinicians to perform regular visual screening for any patient on a long-term course of this medication. If a patient reports "blurred vision" or difficulty seeing traffic lights (red/green),

the drug must be discontinued immediately to prevent permanent blindness. This specific side effect is a favorite topic on medical board exams due to its serious clinical implications.

What is the primary mechanism of action of methotrexate?

(A)

Inhibits DNA synthesis by blocking thymidylate synthase

(B)

Inhibits dihydrofolate reductase, leading to decreased DNA synthesis

(C)

Inhibits RNA synthesis by blocking RNA polymerase

(D)

Interferes with microtubule formation during cell division

Question 66. 77. (C) Ethambutol

This question reinforces the high-yield pharmacological principle detailed in Question 75. Among the first-line antitubercular drugs, Ethambutol is well-known for causing optic neuritis, leading to visual problems such as decreased acuity and red-green color blindness. Rifampicin (Option A) affects the liver and causes red fluid discoloration. Streptomycin (Option B) targets the eighth cranial nerve, causing hearing loss and balance issues. Pyrazinamide (Option D) is most associated with liver toxicity and joint pain due to high uric acid. The ocular toxicity of Ethambutol is often related to the total cumulative dose. It is vital for clinicians to perform regular visual screening for any patient on a long-term course of this medication. If a patient reports "blurred vision" or difficulty seeing traffic lights (red/green), the drug must be discontinued immediately to

prevent permanent blindness. This specific side effect is a favorite topic on medical board exams due to its serious clinical implications.

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B. Inhibits dihydrofolate reductase, leading to decreased DNA synthesis

C. Inhibits RNA synthesis by blocking RNA polymerase

D. Interferes with microtubule formation during cell division

Correct answer: B

decreased DNA synthesis

Methotrexate is an antimetabolite drug that functions as a folic acid analog. Its primary mechanism is the competitive inhibition of the enzyme dihydrofolate reductase (DHFR). DHFR is essential for converting inactive dihydrofolate into active tetrahydrofolate, which is a required cofactor for the synthesis of purines and thymidylate (needed for DNA). By depleting the cell's supply of active folate, methotrexate effectively halts DNA synthesis and cell division. Inhibition of thymidylate synthase

Question 67. (Option A) is the mechanism of 5-Fluorouracil. Blocking RNA polymerase (Option C) is how drugs like rifampicin work. Interference with microtubules (Option D) describes drugs like vincristine or taxanes. Methotrexate is widely used at high doses for chemotherapy and at lower doses for autoimmune conditions like rheumatoid arthritis and psoriasis. Its toxic side effects, such as bone marrow suppression, can be mitigated by "rescuing" normal cells with leucovorin (folinic acid), which bypasses the inhibited DHFR enzyme.

A patient who underwent gastrointestinal surgery has had a portion of her jejunum resected. Which of the following drugs should be added to her postoperative treatment?

A. Liraglutide

B. Teduglutide

C. Exenatide

D. Semaglutide

Correct answer: B

Large resections of the small intestine, such as the jejunum, can lead to "Short Bowel Syndrome," where the remaining gut cannot absorb enough nutrients and water to sustain the body. Teduglutide is a specialized medication that is an analog of Glucagon-Like Peptide-2 (GLP-2). GLP-2 is a natural hormone that promotes the growth and maintenance of the intestinal lining. By mimicking this hormone, Teduglutide increases the surface area of the remaining small intestine (specifically increasing the height of the villi), thereby improving nutrient and fluid absorption. This can significantly reduce the patient's dependence on intravenous parenteral nutrition. Liraglutide (Option A), Exenatide (Option C), and Semaglutide (Option D) are all GLP-1 analogs used for the treatment of type 2 diabetes and obesity; they work by increasing insulin secretion and slowing gastric emptying, which would not address the malabsorption issues in short bowel syndrome. Teduglutide represents a targeted physiological approach to managing gut failure.

What is the most appropriate treatment for a patient presenting with diarrhea and a flask-shaped ulcer seen on colonoscopy?

(A)

Metronidazole

(B)

Ciprofloxacin

(C)

Vancomycin

(D)

Ampicillin

Question 68. 79. (B) Teduglutide

Large resections of the small intestine, such as the jejunum, can lead to "Short Bowel Syndrome," where the remaining gut cannot absorb enough nutrients and water to sustain the body. Teduglutide is a specialized medication that is an analog of Glucagon-Like Peptide-2 (GLP-2). GLP-2 is a natural hormone that promotes the growth and maintenance of the intestinal lining. By mimicking this hormone, Teduglutide increases the surface area of the remaining small intestine (specifically increasing the height of the villi), thereby improving nutrient and fluid absorption. This can significantly reduce the patient's dependence on intravenous parenteral nutrition. Liraglutide (Option A), Exenatide (Option C), and Semaglutide (Option D) are all GLP-1 analogs used for the treatment of type 2 diabetes and obesity; they work by increasing insulin secretion and slowing gastric emptying, which would not address the malabsorption issues in short bowel syndrome. Teduglutide represents a targeted physiological approach to managing gut failure.

What is the most appropriate treatment for a patient presenting with diarrhea and a flask-shaped ulcer seen on colonoscopy?

A. Metronidazole

B. Ciprofloxacin

C. Vancomycin

D. Ampicillin

Correct answer: A

The presence of "flask-shaped" ulcers in the colon is pathognomonic for Amoebic dysentery, caused by the protozoan Entamoeba histolytica. The organism invades the mucosa, creating a narrow neck at the surface and a broad base in the submucosa, resembling a chemist's flask. The standard treatment for symptomatic invasive

amoebiasis is Metronidazole (or tinidazole),
which kills the active trophozoites in the tissue.
This should be followed by a luminal amebicide
like paromomycin to clear any remaining cysts

Question 69. Which of the following is used for the treatment of Datura poisoning?

A. Physostigmine

B. Atropine

C. Sodium nitrite

D. Neostigmine

Correct answer: A

Datura contains belladonna alkaloids (atropine, hyoscine, and hyoscyamine), which cause a severe anticholinergic syndrome. The specific antidote for Datura poisoning is Physostigmine. Physostigmine is a tertiary amine acetylcholinesterase inhibitor that, unlike neostigmine, crosses the blood-brain barrier. This allows it to reverse both the peripheral symptoms (tachycardia, dry skin) and, more importantly, the central nervous system symptoms (agitation, delirium, hallucinations) of Datura poisoning. Atropine (Option B) would worsen the poisoning since Datura already contains atropine. Sodium nitrite (Option C) is used in the treatment of cyanide poisoning. Neostigmine (Option D) is a quaternary amine that does not cross into the brain and therefore cannot address the critical central delirium seen in these patients. Because of the risk of causing seizures or bradycardia, physostigmine should be administered slowly and under close cardiac monitoring. It is a life-saving intervention for severe anticholinergic toxicity.

Question 70. A person dies suddenly while their family is abroad, and the viscera is preserved during autopsy. Which substances can still be detected in the visceral organs even if the person did not consume them immediately before death?

A. Morphine

B. Aconite

C. Arsenic

D. Alcohol

Correct answer: D

Alcohol (ethanol) is unique because it can be detected in viscera even if not consumed before death. This is due to postmortem production of alcohol by bacterial fermentation. After death, microorganisms such as Clostridium and Candida act on carbohydrates present in body tissues, leading to the formation of ethanol. This process is more common in decomposed bodies and can result in detectable alcohol levels despite no premortem intake.

Therefore, the presence of alcohol in viscera must be interpreted carefully in forensic analysis, distinguishing between ante-mortem ingestion and post-mortem formation.

Why other options are incorrect:

(A)

Morphine: Rapidly metabolized and can only be detected if taken before death.

(B)

Aconite: Unstable and decomposes quickly postmortem, making detection difficult unless recently ingested.

(C)

Arsenic: A cumulative poison but not produced postmortem; it is detectable only if consumed during life.

Thus, only alcohol can appear in viscera without prior ingestion, making option (D) correct.

Question 71. A person who was mentally unsound at the time of committing a crime is exempt from legal liability if they were unaware of the nature of their actions or their consequences. What is this legal principle called?

A. McNaughton rule

B. Durham's rule

C. Currens rule

D. Irresistible impulse test

Correct answer: A

The McNaughton rule (or M'Naghten rule) is the foundational legal principle for the insanity defense. It states that a person is not criminally responsible for their actions if, at the time of the offense, a "defect of reason" from a disease of the mind made them unaware of the nature and quality of the act or, if they did know it, that they did not know it was wrong. Durham's rule (Option B) is a broader, less common standard stating that a person is not responsible if their act was the "product" of a mental disease. Currens rule (Option C) relates to the "substantial capacity" to conform one's conduct to the law. The Irresistible impulse test (Option D) focuses on whether a person had the power to control their actions, even if they knew they were wrong. The McNaughton rule remains the most widely used standard in many legal systems, including India (Section 84 of the IPC), as it places the focus on the cognitive ability of the individual at the exact moment of the crime.

Question 72. A vegetable vendor with no prior criminal history went missing and was found dead a week later in an advanced state of decomposition. What methods can be used to identify the body

in such a situation?

A. General recognition

B. DNA profiling

C. Dental records

D. Fingerprints

Correct answer: B

In cases of advanced decomposition, many traditional methods of identification become unreliable. General recognition (Option A) is impossible as the facial features are destroyed. Fingerprints (Option D) are often lost due to skin "gloving" or putrefaction. While dental records (Option C) are a highly effective and standard method, they require a pre-existing dental chart for comparison, which a person like a "vegetable vendor with no history" may not have. DNA profiling is currently the most definitive and robust method for identifying decomposed remains. DNA can be extracted from stable tissues like the teeth or long bones (the femur) even a week or more after death. The profile can then be compared to a reference sample from the missing person's belongings or, more commonly, to DNA from living first-degree relatives. DNA profiling provides a scientific certainty of identification that is essential for legal and closure purposes in missing person cases.

Question 73. A woman develops edema, visual disturbances, and signs of heart failure after consuming a particular food item. What is the most likely adulterant responsible for these symptoms?

A. Sanguinarine

B. BOAA

C. Pyrrolizidine

D. Aflatoxin

Correct answer: A

The clinical presentation of edema, visual disturbances (specifically glaucoma), and heart failure is characteristic of Epidemic Dropsy. This condition is caused by the consumption of mustard oil adulterated with Argemone mexicana seeds, which contain the toxin Sanguinarine. Sanguinarine causes widespread capillary damage and permeability. BOAA (Option B) is the neurotoxin found in Lathyrus sativus (Khesari dal) that causes Neurolathyrism, a spastic paralysis of the legs. Pyrrolizidine alkaloids (Option C) cause Veno-Occlusive Disease (VOD) of the liver, leading to ascites. Aflatoxin (Option D) is a potent carcinogen produced by fungi on stored grains and is a major risk factor for liver cancer. Epidemic dropsy is a serious public health issue in areas where adulterated cooking oil is sold. Early diagnosis and supportive care are essential, as the cardiac failure can be rapidly fatal. Testing for the presence of Argemone oil is done using the simple Nitric Acid test or chromatography.

Question 74. Which medical procedure has been banned by the Supreme Court of India due to its association with cases of sexual assault involving doctors?

A. Foley's catheter insertion

B. Colposcopy

C. PV speculum insertion

D. Two-finger test

Correct answer: D

The Supreme Court of India has strictly banned the "two-finger test" (per-vaginal examination to assess "vaginal laxity") in cases of sexual assault. The court ruled that this test has no scientific or medical validity for determining whether a sexual assault occurred or for assessing the "character" or "habitual" nature of a victim's sexual activity. The test is considered a violation of the victim's dignity, privacy, and bodily integrity, effectively re-traumatizing them. Foley's catheter insertion (Option A), colposcopy (Option B), and speculum insertion (Option C) are legitimate medical procedures used for urinary drainage or gynecological diagnosis and have not been banned, provided they are done with informed consent and for proper medical indications. The ban on the two-finger test is a landmark decision in Indian medical jurisprudence, aimed at modernizing the forensic approach to sexual assault and ensuring that survivors are treated with sensitivity and respect during the legal process.

Question 75. Which vector is responsible for transmitting Orientia tsutsugamushi?

A. Mite

B. Tick

C. Louse

D. Flea

Correct answer: A

Orientia tsutsugamushi is the causative agent of Scrub Typhus, a significant zoonotic disease. It is transmitted to humans through the bite of the larval stage (chigger) of trombiculid mites. These chiggers are often found in areas with dense vegetation ("scrub"), giving the disease its name. Ticks (Option B) transmit diseases like Rocky Mountain spotted fever and Lyme disease. Lice (Option C) transmit epidemic typhus. Fleas (Option D) transmit the bubonic plague and murine typhus. A classic clinical sign of Scrub Typhus is the "eschar," a small, dark, painless ulcer with a black crust that forms at the site of the chigger bite. The disease presents with high fever, headache, and generalized lymphadenopathy. Doxycycline is the first-line treatment and is highly effective. Scrub typhus is a major under-diagnosed cause of acute febrile illness in many parts of the world.

Question 76. What is the investigation of choice for detecting

enteric fever in the first week?

A. Blood culture

B. Urine culture

C. Stool culture

D. Antibody detection

Correct answer: A

Enteric fever (Typhoid) is caused by Salmonella Typhi. The diagnostic yield of various tests changes significantly as the disease progresses. During the first week of illness, blood culture is the investigation of choice, with a sensitivity of . As the bacteria move into the lymphoid tissue, stool culture (Option C) becomes more useful in the second and third weeks. Urine culture (Option D) is generally positive in the third week. Antibody detection (Option D), such as the Widal test, only becomes positive after the first week and is notoriously unreliable due to many false positives. A useful mnemonic for the timing of cultures is "BASU": Blood (1st week), Antibody/Widal (2nd week), Stool (3rd week), and Urine (4th week). Bone marrow culture is actually the most sensitive test overall (up to), even if the patient has already started antibiotics, but it is rarely done due to its invasiveness.

Question 77. Which microorganism is most likely responsible for causing bilateral pulmonary infiltrates in an HIV-positive patient?

A. Cryptococcus

B. Histoplasmosis

C. Pneumocystis Jirovecii

D. Aspergillus

Correct answer: C

In an HIV-positive patient with a low CD4 count, the classic cause of pneumonia presenting with bilateral, diffuse interstitial infiltrates (often described as "ground-glass" opacities) on a chest X-ray is Pneumocystis jirovecii. As discussed in Questions 54 and 100, this fungal pathogen causes an opportunistic infection that characteristically spreads through the alveolar spaces of both lungs simultaneously. Cryptococcus (Option A) more commonly causes meningitis or focal lung nodules. Histoplasmosis (Option B) can cause diffuse disease but often presents with hilar lymphadenopathy or miliary-style patterns. Aspergillus (Option D) typically causes focal consolidation or cavities in immuno compromised hosts. Pneumocystis pneumonia (PCP) remains a leading cause of hospitalization and death in patients who are unaware of their HIV status or who are not consistently on antiretroviral therapy. Diagnosis is confirmed by visualizing the organism in sputum or BAL fluid using specialized stains like Silver stain or by PCR testing.

101. A patient presents with watery diarrhea and

vomiting. The causative pathogen shows darting motility. What is the most appropriate selective culture media for isolating this pathogen?

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Question 78. 100. (C) Pneumocystis Jirovecii
In an HIV-positive patient with a low CD4 count, the classic cause of pneumonia presenting with bilateral, diffuse interstitial infiltrates (often described as "ground-glass" opacities) on a chest X-ray is Pneumocystis jirovecii. As discussed in Questions 54 and 100, this fungal pathogen causes an opportunistic infection that characteristically spreads through the alveolar spaces of both lungs simultaneously. Cryptococcus (Option A) more commonly causes meningitis or focal lung nodules. Histoplasmosis (Option B) can cause diffuse disease but often presents with hilar lymphadenopathy or miliary-style patterns. Aspergillus (Option D) typically causes focal consolidation or cavities in immuno compromised hosts. Pneumocystis pneumonia (PCP) remains a leading cause of hospitalization and death in patients who are unaware of their HIV status or who are not consistently on antiretroviral therapy. Diagnosis is confirmed by visualizing the organism in sputum or BAL fluid using specialized stains like Silver stain or by PCR testing.
A patient presents with watery diarrhea and vomiting. The causative pathogen shows darting motility. What is the most appropriate selective culture media for isolating this pathogen?
A. Nutrient media
B. TCBS
C. Cetrimide agar
D. Potassium Tellurite Agar
Correct answer: B

The clinical presentation of profuse watery diarrhea and vomiting, combined with the hallmark finding of "darting motility" under dark-field microscopy, is pathognomonic for

Question 79. Relative bradycardia is seen in:

A. Dengue

B. Brucella

C. Bordetella

D. Leptospirosis

Correct answer: B

Relative bradycardia, also known as Faget's sign, occurs when the pulse rate does not increase proportionally with the body temperature during a febrile illness. This clinical phenomenon is a classic feature of certain infections, most notably Enteric (Typhoid) fever and Brucella. While several other conditions can manifest this sign, Brucella is a primary choice among the listed options. Dengue (A) typically presents with high-grade fever and tachycardia, although a transient bradycardia may occur during the convalescent phase. Bordetella pertussis (C) primarily affects the respiratory tract with paroxysmal coughing and does not typically exhibit Faget's sign. Leptospirosis (D) is associated with high fever and conjunctival suffusion; while it can have cardiac complications, it is not the defining clinical association for relative bradycardia in standardized medical testing. Recognizing this pulse-temperature dissociation is a valuable diagnostic tool in evaluating undifferentiated tropical fevers. Therefore, Brucella is the most accurate answer for this characteristic physiological finding in the context of these options.

Question 80. Identify the given organism?

A. Microsporum Gypseum

B. Microsporum audouinii

C. Epidermophyton Floccosum

D. Trichophyton

Correct answer: C

The provided image (located at the top of Page 9) displays characteristic large, smooth-walled, club-shaped macroconidia arranged in clusters, which are diagnostic features of Epidermophyton floccosum. A key distinguishing feature of this genus is the absence of microconidia, which separates it from other common dermatophytes. This fungus is a frequent cause of tinea cruris, tinea pedis, and tinea unguium. Microsporum gypseum (A) produces thin-walled, ellipsoidal macroconidia with up to six cells. Microsporum audouinii (B) typically shows very rare conidia and is known for pectinate hyphae. The genus Trichophyton (D) is characterized by abundant microconidia and rare, smooth, pencil-shaped macroconidia. Because the visual evidence specifically highlights the "beaver-tail" or club-shaped morphology

and lacks smaller spores, the identification is definitively Epidermophyton. Morphology of dermatophytes is a high-yield topic for FMGE, and correctly differentiating between these three main genera based on microscopic conidial structure is essential for clinical diagnosis.

Question 81. What is the mechanism of action of diphtheria toxin?

A. ADP phosphorylation of EF-2 Decreasing protein synthesis

B. Increasing cAMP

C. Increasing cGMP

D. Decreasing 60s ribosome

Correct answer: A

The Corynebacterium diphtheriae toxin is a potent A-B exotoxin that acts by inhibiting protein synthesis in host cells. Specifically, the "A" subunit catalyzes the ADP-ribosylation of Elongation Factor-2 (EF-2). This covalent modification inactivates EF-2, which is essential for the translocation of the polypeptide chain during translation, thereby halting protein production and leading to cell death. Increasing cAMP (B) is the mechanism used by toxins from Vibrio cholerae and ETEC (heat-labile toxin). Increasing cGMP (C) is associated with the heat-stable toxin of ETEC. Decreasing or inactivating the 60s ribosomal subunit (D) is the mechanism of the Shiga toxin produced by Shigella dysenteriae and Shiga-like toxins of EHEC. Understanding these distinct biochemical pathways of bacterial toxins is a fundamental requirement for medical microbiology and infectious disease questions. Consequently, the specific inactivation of EF-2 via ADP-ribosylation remains the hallmark clinical and pathological feature of the diphtheria toxin.

Question 82. Human infection occurs through ingestion of quadrinucleate cysts in contaminated food or water. Which organism is most likely responsible for this infection?

A. Giardia lamblia

B. Entamoeba Histolytica

C. Cryptosporidium parvum

D. Cyclospora Cayetanensis

Correct answer: B

The ingestion of mature, quadrinucleate cysts via the feco-oral route is the standard mode of transmission for Entamoeba histolytica, the protozoan responsible for amoebiasis. Once ingested, these resistant cysts undergo excystation in the small intestine to release trophozoites, which can cause characteristic flask-shaped ulcers in the colon or extra-intestinal complications like liver abscesses. Giardia lamblia (A) also forms cysts, but these are typically

ellipsoidal and contain four nuclei alongside distinct internal structures like axostyles. Cryptosporidium parvum (C) produces oocysts that are immediately infectious upon excretion but are not described as quadrinucleate in the same diagnostic context. Cyclospora cayetanensis (D) involves the ingestion of sporulated oocysts containing two sporocysts, each with two sporozoites. Because the term "quadrinucleate cyst" is the classic, high-yield descriptive hallmark for the infectious stage of E. histolytica in medical parasitology, it is the most accurate answer for this clinical vignette.

Question 83. Which of the following is the diagnostic test for monkeypox?

A. ELISA

B. Hemagglutination assay

C. PCR

D. Hybrid Capture assay

Correct answer: C

Polymerase Chain Reaction (PCR) is the preferred laboratory test for the diagnosis of Mpox (formerly monkeypox) due to its high sensitivity and specificity in detecting viral DNA. The most reliable samples are collected directly from the skin lesions, such as swabs of the vesicle crust, fluid, or the roof of the lesion. ELISA (A) measures IgM and IgG antibodies; however, these are less reliable for acute diagnosis because cross-reactivity with other orthopoxviruses (like smallpox or varicella) is common, and antibodies may only appear late in the disease course. Hemagglutination assays (B) are largely historical or research-based and lack the diagnostic precision required for modern clinical management. Hybrid Capture assays (D) are primarily utilized for detecting Human Papillomavirus (HPV) and are not standard for orthopoxvirus testing. Given the recent global outbreaks, PCR has been established as the gold standard for rapid confirmation, enabling proper isolation and public health intervention. Clinicians must prioritize lesion sampling to ensure the highest viral load for successful PCR detection.

PSM

Question 84. How does the World Health Organization (WHO) define blindness?

A. VA < 3/60

B. VA < 6/60

C. VA > 3/60

D. VA 6 > 6/60

Correct answer: A

The World Health Organization (WHO) provides a standardized definition for blindness to facilitate global health comparisons and resource allocation. According to these criteria, blindness is defined as a visual acuity (VA) of less than (Snellen) or its equivalent in the better

eye with the best possible correction. This means the individual cannot count fingers from a distance of 3 meters. Additionally, a visual field of less than 10 degrees from the point of fixation in the better eye is also classified as blindness. A visual acuity of less than but better than or equal to (Option B) is categorized as "severe visual impairment" rather than blindness. Standardizing this definition is critical for programs like "VISION 2020: The Right to Sight" to monitor the prevalence of avoidable blindness. Properly identifying these thresholds ensures that public health interventions are targeted toward those with the greatest need for rehabilitative or surgical services.

Question 85. The Anemia Mukt Bharat program aims to reduce anemia across India through targeted interventions. Which statement correctly describes how Iron and Folic Acid (IFA) supplementation is administered under this program?

A. IFA is provided during the 2nd trimester of pregnancy and continues during lactation for up to 6 months

B. IFA supplementation is administered solely during pregnancy

C. A 100-day course of IFA supplementation is sufficient

D. Administering IFA during the 1st trimester is adequate.

Correct answer: A

The Anemia Mukt Bharat (AMB) strategy follows a comprehensive "6x6x6" framework to reduce anemia prevalence across the life cycle. For pregnant women, the protocol mandates the administration of one Iron and Folic Acid (IFA) tablet daily, containing 60 mg of elemental iron and 500 mcg of folic acid. This starts in the second trimester (after the first 12 weeks of pregnancy) and continues for 180 days throughout the remainder of the pregnancy. Crucially, the supplementation must continue postpartum during lactation for an additional 180 days (6 months). Solely administering it during pregnancy (Option B) is insufficient to replenish maternal iron stores depleted during childbirth. A 100-day course (Option C) was the older standard, now replaced by the 180-day regimen to ensure better clinical outcomes. First-trimester administration (Option D) is generally avoided to prevent aggravating nausea

and because the physiological demand for iron increases most rapidly during the second and third trimesters.

Question 86. A study was conducted in three states to measure the mean blood pressure in each community. Health workers visited every household in the three communities, and the mean blood pressures were then compared across communities. What type of study design does this represent?

A. Case-control

B. Cross-sectional

C. Cohort

D. Ecological study

Correct answer: B

This study involves health workers visiting households and measuring blood pressure at a single point in time. The data is collected simultaneously from individuals in each community and then summarized (mean BP) for comparison. Since exposure/outcome (here BP levels) are measured at one time without follow-up, it fits the definition of a cross-sectional study.

Although results are later compared between communities, the primary data collection is at the individual level, which is key. Therefore, it is not an ecological study, where only group-level data is used.

Why other options are incorrect:

(A)

Case-control: Involves selecting cases and controls and looking back for exposure—not done here.

(C)

Cohort: Requires follow-up over time to assess outcomes—absent here.

(D)

Ecological study: Uses only group-level data, but here individual measurements were collected first.

Hence, this is a cross-sectional study.

Question 87. For what population size is an urban Primary Health Centre (PHC) typically intended?

A. 1 per 50,000

B. 1 per 100,000

C. 1 per 250,000

D. 1 per 200,000

Correct answer: A

Under the National Urban Health Mission (NUHM) in India, the health infrastructure is tailored to the high density of city populations. An Urban Primary Health Centre (U-PHC) is established to cater to a population of approximately 50,000 people. These centers serve as the first point of contact for the urban poor, particularly those living in slums or unauthorized colonies. This differs from rural norms, where a PHC covers 20,000 in hilly/tribal areas or 30,000 in plain areas. A population of 100,000 (Option B) is typically the benchmark for an Urban Community Health Centre (U-CHC), which provides more specialized services and indoor beds. Options C and D (250,000 and 200,000) do not correspond to the standard planning norms for primary health units in India. The U-PHC focuses on delivering essential services like immunization, maternal care, and screening for non-communicable diseases, ensuring that healthcare is accessible within a manageable distance for urban residents.

Question 88. What concentration of fluoride is typically associated with causing crippling fluorosis?

A. > 10 mg/L

B. > 6 mg/L

C. > 3 mg/L

D. > 1.5 mg/L

Correct answer: A

Fluoride exposure has a narrow therapeutic window, with varying clinical effects depending on the concentration in drinking water. Crippling fluorosis is the most severe form of skeletal fluorosis, characterized by extreme joint stiffness, calcification of ligaments, and debilitating spinal deformities. This condition typically arises after prolonged ingestion (over 10-20 years) of water with fluoride levels exceeding . At lower concentrations between and (Options B and C), individuals may develop milder forms of skeletal fluorosis, such as joint pain and increased bone density, but it is not termed "crippling." Dental fluorosis (mottling of enamel) starts appearing at levels above (Option D). The ideal fluoride level for preventing dental caries while avoiding toxicity is to . Because the question specifically asks for the concentration associated with the most advanced, debilitating stage of the disease, is the correct clinical threshold.

(A) Pulsus bisferians

(B) Kussmaul breathing

(C) SBP falls from 80mmHg to 60mmHg

(D) Fine crepitations

AAns

(C) SBP falls from 80mmHg to 60mmHg

The patient’s presentation—history of tuberculosis, abdominal distension, pedal edema, and raised JVP—along with chest X-ray findings suggests cardiac tamponade due to tuberculous pericardial effusion.

A key diagnostic feature of cardiac tamponade is pulsus paradoxus, defined as an exaggerated fall in systolic blood pressure (>10 mmHg) during inspiration. The option given (SBP falls from 80 to 60 mmHg) clearly represents this phenomenon.

Pathophysiology : In tamponade, fluid accumulation in the pericardial sac compresses the heart, impairing ventricular filling. During inspiration, increased venous return to the right heart further compromises left ventricular filling, causing a marked drop in systolic BP.

Why other options are incorrect:

(A)

Pulsus bisferiens: Seen in aortic regurgitation/HOCM, not tamponade

(B)

Kussmaul breathing: Seen in constrictive pericarditis, not tamponade

(D)

Fine crepitations: Suggest pulmonary edema, not a key feature here

Thus, the most likely finding is pulsus paradoxus → option (C).

Question 89. Which of the following is a technology-based surveillance system used for tuberculosis (TB) control in India?

A. Nikshay

B. Nischay

C. Dots99

D. DOTS

Correct answer: A

Nikshay is the unified ICT (Information and Communication Technology) platform for tuberculosis (TB) surveillance and case management under India's National TB Elimination Programme (NTEP). It allows health officials to track TB patients from diagnosis through treatment completion across both public and private sectors. The platform facilitates real-time notification, monitors treatment adherence, and manages Direct Benefit Transfers (DBT) to patients for nutritional support. Nischay (Option B) is a brand of home pregnancy test kits and not related to TB. Dots99 (Option C) refers to a specific adherence monitoring tool using toll-free missed calls on medication packaging but is not the overarching surveillance system. DOTS (Option D) stands for "Directly Observed Treatment, Short-course," which is the standardized clinical management strategy rather than a digital surveillance application. Nikshay's comprehensive database is vital for evaluating program performance and achieving

the national goal of eliminating TB by 2025 through data-driven public health actions.

Question 90. In the case of a newly occurring (morbid) disease, how does a change in incidence affect the prevalence of the disease?

A. Prevalence is not related to incidence

B. Incidence will increase, and prevalence will decrease

C. Incidence and prevalence will increase

D. Prevalence will increase with a decrease in the incidence

Correct answer: C

Incidence and prevalence are fundamental epidemiological measures linked by the formula: . Incidence represents the number of new cases of a disease occurring in a population during a specific timeframe. Prevalence represents the total number of existing cases (new and old) at a single point in time. When there is a "new onset" of a morbid disease, the number of new cases (incidence) naturally rises. As these new cases accumulate in the population, they add to the total pool of affected individuals, thereby causing the prevalence to increase as well. Option A is incorrect because the two are mathematically related. Option B is illogical, as an increase in new cases cannot lead to a decrease in total cases without a massive, simultaneous spike in deaths or cures. Option D is generally false, as a drop in incidence usually leads to a eventual drop in prevalence. Thus, for any newly emerging disease, both metrics show a rising trend.

Question 91. Calculate relative risk for the given situation:

Group
Exposed to malaria
Not exposed to malaria
Vaccinated
6
94
Non-vacci-nated
12
88

A. 0.5

B. 2

C. 1.5

D. 1.7

Correct answer: A

To calculate Relative Risk (RR), we use the formula:

Question 92. Wasting in a child is assessed by which of the following measures?

A. Weight-for-height

B. Weight-for-age

C. Height-for-weight

D. Height-for-age

Correct answer: A

Anthropometric indices are essential for identifying different forms of malnutrition in children. Wasting is defined as low weight-for-height and is a sensitive indicator of "acute" malnutrition. It reflects a recent and severe process of weight loss, often caused by acute starvation or a severe infectious disease episode. Height-for-age (Option D) is used to identify stunting, which represents chronic or long-term malnutrition resulting in a failure to reach linear growth potential. Weight-for-age (Option B) identifies a child as underweight; this is a composite indicator that can reflect both acute and chronic malnutrition but does not distinguish between them. Height-for-weight (Option C) is not a standard index used in pediatrics. Wasting is critical to detect because it carries a significantly high risk of mortality if the child does not receive immediate therapeutic feeding. The WHO growth standards use Z-scores for weight-for-height to diagnose moderate or severe acute malnutrition in community settings.

Question 93. What were the target goals for Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) to be achieved by 2023?

A. 70/30

B. 30/70

C. 100/30

D. 30/100

Correct answer: A

India’s National Health Policy (NHP) 2017, aligned with the Sustainable Development Goals (SDGs), set specific targets to be achieved by 2023:

Maternal Mortality Ratio (MMR): < 70 per 100,000 live births Infant Mortality Rate (IMR): ≈ 28–30 per 1,000 live births Thus, the combined target is correctly represented as 70/30.

Why the other options are incorrect:

1.

Option B (30/70): Reverses the indicators (MMR and IMR).

2.

Option C (100/30): Reflects older benchmarks; many states had already reduced MMR below 100 before 2023.

3.

Option D (30/100): Inconsistent with national priorities and epidemiological realities.

Achieving the 70/30 target depends on improving institutional deliveries, quality antenatal and postnatal care, strengthening Special Newborn Care Units (SNCUs), and effective implementation of programs like Janani Suraksha Yojana. These targets are key indicators of progress in maternal and child health.

Question 94. What is the WHO definition of blindness?

A. 6/60

B. 3/60

C. 6/18

D. 1/60

Correct answer: B

The World Health Organization (WHO) provides specific clinical criteria to define blindness for standardized global health monitoring. Blindness is defined as a visual acuity (VA) of less than (on the Snellen chart) in the better eye with the best possible correction. This corresponds to the inability of a person to count fingers at a distance of 3 meters. Visual acuity of (Option A) is the threshold for "visual impairment" but does not reach the definition of blindness. Visual acuity of (Option C) is considered the upper limit of normal vision in many screening contexts; anyone with better vision is not categorized as impaired. Visual acuity of (Option D) is technically within the category of blindness, but it is not the standard "threshold" level used for definition. The definition also includes a visual field restricted to less than 10 degrees from the point of fixation. Consistent use of this definition is vital for tracking progress in initiatives like "VISION 2020."

Question 95. In a population with 4,050 total births, there are 50 stillbirths, 50 deaths within the first 7 days of life, and 150 deaths between 8 and 28 days of life. What is the Neonatal Mortality Rate (NMR) for this population?

A. 12.5

B. 50

C. 49.4

D. 62.5

Correct answer: B

The Neonatal Mortality Rate (NMR) is defined as the number of deaths among live-born infants

within the first 28 days of life per 1,000 live births.

Let us calculate step by step:

1.

Total births = 4050

This includes 50 stillbirths, which must be excluded.

Why other options are incorrect:

1.

Option A (12.5): Represents only early neonatal mortality rate (50/4000 × 1000).

2.

Option C (49.4): Incorrectly uses total births (4050) instead of live births as the denominator.

3.

Option D (62.5): Not derived from the given data.

Thus, the Neonatal Mortality Rate is 50 per 1,000 live births, making Option (B) correct.

Question 96. Which of the following is not included in the SAFE strategy for trachoma?

A. Surgery for trichiasis

B. Antibiotics

C. Facial cleanliness

D. Evaluation of control program

Correct answer: D

The WHO-recommended "SAFE" strategy is a comprehensive approach to eliminate trachoma, the world's leading infectious cause of blindness. Each letter represents a specific intervention:

S

Surgery for individuals with trichiasis (in-turned eyelashes) to prevent corneal scarring.

A

Antibiotics (typically oral azithromycin) to treat active Chlamydia trachomatis infection in the community.

F

Facial cleanliness to reduce the transmission of the bacteria via fingers and flies.

E

Environmental improvements, such as increased access to water and improved sanitation, to eliminate breeding sites for flies. While "Evaluation of the control program" (Option D) is an essential administrative task for any public health initiative, it is not one of the four technical pillars that constitute the "SAFE" acronym. The strategy addresses both the immediate clinical needs of patients and the underlying socio-environmental factors that allow the disease to persist in endemic regions.

Question 97. Villages A and B have different age distributions.

Which indicator is most appropriate for comparing the death rates between these two villages?

A. Crude death rate

B. Age standardized death rate

C. Specific death rate

D. Proportional mortality rate

Correct answer: B

When comparing mortality across populations with different age structures, the Age Standardized Death Rate is the most reliable indicator. In this scenario, Village B has a significantly larger elderly population (10,000 people aged 60+) compared to Village A (7,000). Because older people naturally have higher death rates, a direct comparison using the Crude Death Rate (Option A) would be biased, likely showing higher mortality in Village B simply due to its age composition rather than poor health quality. Standardization mathematically "removes" the influence of age by applying observed death rates to a common standard population. Specific death rates (Option C) provide details for a single group but not an overall comparison. Proportional mortality (Option D) measures the percentage of deaths from a specific cause and does not assess overall death risk. Standardization allows epidemiologists to make a fair, "apples-to-apples" comparison between disparate communities to identify true health disparities.

Question 98. Paris green dust is commonly used to kill which of the following?

A. Anopheles larva

B. Houseflies

C. Bedbugs

D. Cockroaches

Correct answer: A

Paris green (copper acetoarsenite) is a specialized stomach poison used in public health for mosquito control. It is primarily applied as a dust to the surface of stagnant water bodies to target Anopheles larvae, which are the vectors of malaria. Unlike Culex larvae, which feed at the bottom, Anopheles larvae feed at the water's surface, where they ingest the toxic Paris green particles. Houseflies (Option B) are typically managed with residual sprays or baits like malathion. Bedbugs (Option C) and cockroaches (Option D) require different classes of insecticides, such as pyrethroids or organophosphates, applied to cracks and crevices where they reside. While Paris green was a historical cornerstone of malaria eradication programs, it has largely been superseded by more modern larvicides (like Temephos) and biological control agents (like Bti) due to the environmental risks associated with its arsenic content. However, it

remains a classic topic in exams regarding historical vector control strategies.

Question 99. What is the growth rate if the crude birth rate is 19 and the crude death rate is 7?

A. 1.2%

B. 0.7%

C. 1.1%

D. 1.5%

Correct answer: A

The annual population growth rate (also known as the rate of natural increase) is determined by the difference between birth and death rates. The formula is: .

1.

Calculate the Natural Increase: per 1,000 people.

2.

Convert to Percentage: . Option B (0.7%) is merely the death rate expressed as a percentage. Options C (1.1%) and D (1.5%) are mathematically incorrect for this data set. This calculation assumes a "closed population" with zero net migration; in actual demographic studies, migration would also be factored in. A growth rate of 1.2% reflects a population in the middle stages of demographic transition, where mortality has dropped significantly, but fertility is still in the process of declining. This metric is vital for government planning regarding future needs for schools, housing, and healthcare.

Question 100. What is the recommended free residual chlorine level in a well after chlorination to ensure effective disinfection?

A. 0.3 ppm after 1 hour

B. 0.5 ppm after 2 hours

C. 0.8 ppm after 1 hour

D. 1.5 ppm after 2 hours

Correct answer: A

For well chlorination, the recommended standard is to achieve a free residual chlorine level of about 0.5 ppm after 1 hour of contact time. However, in practice and exam interpretation, 0.3 ppm after 1 hour is accepted as the minimum effective residual level to ensure adequate disinfection.

This level indicates that sufficient chlorine remains after reacting with organic matter, ensuring continued antimicrobial activity and safe drinking water.

Why other options are incorrect:

(B)

0.5 ppm after 2 hours: Although effective, the standard reference is based on 1-hour contact

time, not 2 hours.

(C)

0.8 ppm after 1 hour: Higher than required; not a standard recommendation.

(D)

1.5 ppm after 2 hours: Excessive and unnecessary; may affect taste and safety.

Thus, the accepted exam answer is 0.3 ppm after 1 hour.

Question 101. Heart of sewage disposal plant:

A. Primary sedimentation tank

B. Aeration tank

C. Secondary sedimentation tank

D. Sludge digestion tank

Correct answer: B

The aeration tank is called the “heart of a sewage disposal plant” because it is the main site of biological treatment. Here, activated sludge (microorganisms) breaks down organic matter in sewage using oxygen supplied by aeration. This process significantly reduces biochemical oxygen demand (BOD) and removes most of the pollutants.

Why other options are incorrect:

(A)

Primary sedimentation tank:Removes suspended solids by settling, but no major biological treatment occurs.

(C)

Secondary sedimentation tank:Used for settling of activated sludge after aeration, not the main treatment step.

(D)

Sludge digestion tank:Handles sludge stabilization (anaerobic digestion), not primary sewage purification.

Since the maximum purification occurs in the aeration tank, it is considered the heart of the sewage treatment plant.

Question 102. Administering benzathine penicillin to a patient with rheumatic heart disease represents which level of prevention?

A. Primordial

B. Primary

C. Secondary

D. Tertiary

Correct answer: C

Prevention levels are defined by when the intervention occurs in the disease's natural history.

Secondary prevention focuses on early diagnosis and prompt treatment to prevent disease recurrence or complications. In a patient who already has Rheumatic Heart Disease (RHD), administering benzathine penicillin is a form of secondary prophylaxis. The goal is to prevent a recurrent Group A Streptococcal infection, which would trigger further immunological damage to the heart valves. Primary prevention (Option B) would be treating an initial streptococcal sore throat in a healthy child to prevent the first onset of rheumatic fever. Primordial prevention (Option A) involves avoiding the emergence of risk factors, like improving living conditions to reduce overcrowding. Tertiary prevention (Option D) involves rehabilitative efforts or surgery, like valve replacement, after permanent disability has occurred. Since the patient already has a diagnosed morbid condition (RHD), the intervention fits the definition of secondary prevention.

Question 103. Which pneumoconiosis is caused by exposure to cotton dust?

A. Byssinosis

B. Bagassosis

C. Anthracosis

D. Silicosis

Correct answer: A

Byssinosis is an occupational lung disease caused by the inhalation of dust from cotton, flax, or hemp. It is often called "Monday morning fever" because symptoms like chest tightness and dyspnea are typically most severe when workers return to the textile mill after a weekend break. Bagassosis (Option B) is a hypersensitivity pneumonitis caused by inhaling dust from moldy sugar cane fiber (bagasse). Anthracosis (Option C) is caused by the inhalation of coal dust or carbon particles and is commonly found in miners. Silicosis (Option D) is caused by inhaling crystalline silica dust in industries like stone cutting or sandblasting. Long-term chronic exposure to cotton dust can eventually lead to permanent, irreversible obstructive lung disease. Prevention focuses on industrial hygiene, including improved local exhaust ventilation, the use of personal protective masks, and regular medical screening of workers to detect early respiratory decline.

Question 104. How do you calculate the mid-parental height for a male child with a father who is 183 cm tall and a mother who is 175 cm tall?

A. 185.5

B. 169.5

C. 192.5

D. 195.5

Correct answer: A

The mid-parental height (MPH) is used to estimate a child’s genetic height potential.

For a male child, the formula is:

(Which corresponds to Option B).

Most children achieve an adult height within ±8–10 cm of their mid-parental height. This calculation helps clinicians assess whether a child’s growth pattern is consistent with familial height or requires further evaluation.

Question 105. Which term describes the practice of imposing a specific point of view on people while suppressing independent thinking?

A. Health Propaganda

B. Health Promotion

C. Health Awareness

D. Health Education

Correct answer: A

Propaganda is a communication technique that aims to influence people's attitudes and behaviors by presenting information in a one-sided, often biased manner. In health settings, it involves instilling a specific viewpoint while actively discouraging or inhibiting independent critical thinking. Health Education (Option D), by contrast, is a planned process designed to provide individuals with balanced information and skills to make informed independent choices about their well-being. Health Promotion (Option B) is a broader ecological concept that includes education along with environmental and political changes to give people more control over their health. Health Awareness (Option C) is simply the state of being conscious that a health problem exists. Propaganda relies on repetition and emotional appeals rather than logic. While it can be used for "positive" outcomes like vaccination, its fundamental method—bypassing the individual's rational choice—is distinct from the empowering principles of health education.

Question 106. What is the recommended work area per worker in a factory, assuming that any height above a certain limit is disregarded in the calculation?

A. 100 cubic feet

B. 500 cubic feet

C. 300 cubic feet

D. 400 cubic feet

Correct answer: B

The Factories Act in India establishes strict guidelines to prevent overcrowding and ensure worker safety and ventilation. Every workroom must provide at least 500 cubic feet of space for every individual worker employed therein. When calculating this volume, the Act specifies that any height above 14 feet (approximately 4.25 meters) from the floor is not taken into account.

This rule ensures that employers provide sufficient horizontal floor area rather than meeting the requirement through very high ceilings in cramped rooms. Options A, C, and D (100, 300, and 400) are below the legal safety threshold. Maintaining this standard is essential for reducing the spread of airborne infections, minimizing heat stress, and ensuring that workers have enough room to operate machinery without accidental collisions. Compliance with these spacing requirements is a critical part of regular occupational health and safety inspections.

ENT

Question 107. What is the preferred treatment for a pediatric patient with symptomatic adenoid hypertrophy causing chronic nasal obstruction and sleep apnea?

A. Adenoidectomy

B. Adenoidectomy with grommet insertion

C. Antibiotic therapy

D. Watchful waiting

Correct answer: A

Adenoidectomy—the surgical removal of the adenoid tissue—is indicated for children who have significant lymphoid hypertrophy leading to complications like chronic nasal obstruction, persistent mouth breathing, or obstructive sleep apnea (OSA). If the child also has persistent otitis media with effusion (glue ear) causing hearing loss, an adenoidectomy with grommet (myringotomy tube) insertion (Option B) would be preferred; however, for isolated OSA and nasal symptoms, adenoidectomy alone is standard. Antibiotic therapy (Option C) might resolve an acute episode of adenoiditis but will not shrink chronically hypertrophied tissue. Watchful waiting (Option D) is generally inappropriate for a child already suffering from sleep apnea, which can lead to cognitive deficits, growth delay, and cardiovascular strain. Surgery is typically highly effective, leading to an immediate restoration of a normal nasal breathing pattern and significantly improved quality of sleep for the pediatric patient.

Question 108. A patient with a history of trauma presents with hearing loss, and a high-resolution CT (HRCT) scan is performed. Which of the following structures is not typically visualized on HRCT?

A. Cochlea

B. Vestibule

C. Semicircular canal

D. Organ of Corti

Correct answer: D

High-Resolution Computed Tomography (HRCT) of the temporal bone is the gold standard for

visualizing the bony architecture of the middle and inner ear. It provides excellent detail of the bony labyrinth, including the 2.5 turns of the cochlea (Option A), the vestibule (Option B), and the semicircular canals (Option C). HRCT is highly effective at identifying temporal bone fractures or ossicular chain disruptions. However, HRCT uses X-rays and is primarily limited to visualizing bone and air spaces; it does not have the soft-tissue resolution to visualize microscopic structures like the Organ of Corti, which is the sensory neuroepithelium within the cochlear duct. To visualize fine soft-tissue details, fluids, or nerves (like the vestibulocochlear nerve), Magnetic Resonance Imaging (MRI) is the required modality. Therefore, while HRCT is essential after trauma, it cannot directly confirm damage to the delicate sensory hair cells of the inner ear.

Question 109. What is the preferred initial management for a patient presenting with cerebrospinal fluid (CSF) rhinorrhea?

A. Functional Endoscopic Sinus Surgery (FESS)

B. Administration of steroids

C. Bed rest with head elevation and avoidance of straining activities

D. Immediate surgical repair without initial medical management

Correct answer: C

Most traumatic CSF leaks, such as those following head injury or sinus surgery, resolve spontaneously without the need for immediate surgical intervention. The preferred initial approach is conservative medical management. This includes absolute bed rest with the head of the bed elevated at 30-40 degrees to lower intracranial pressure. The patient must strictly avoid activities that increase intracranial pressure (straining), such as nose blowing, coughing, or heavy lifting (Valsalva maneuvers), which can push air into the skull or prevent the dural tear from sealing. FESS (Option A) and other surgical repairs (Option D) are reserved for leaks that persist beyond 7-14 days of conservative care. Steroids (Option B) have no proven role in sealing a leak and may theoretically increase the risk of infection. Prophylactic antibiotics are also generally avoided to prevent the selection of resistant organisms should meningitis eventually occur.

Question 110. Identify the given instrument:

A. Universal retractor

B. Doyen's speculum

C. Mouth clamp

D. Eye speculum

Correct answer: D

The image displays a Barraquer wire eye speculum, a fundamental instrument in ophthalmology. It is used to retract and hold the eyelids open during surgical procedures like cataract extraction or corneal repair. Its lightweight, spring-wire design allows it to maintain lid retraction without placing excessive pressure on the globe itself. A universal retractor (Option A) is a generic term for several hand-held or self-retaining retractors used in general surgery. Doyen's speculum (Option B) is a large, heavy retractor used in abdominal or vaginal surgery. A mouth clamp (Option C) is used in anesthesia or oral surgery to keep the patient's jaws separated. Because the instrument's size and delicate frame are clearly designed for the periorbital area, it is identified as an eye speculum. Familiarity with such specialty instruments is a core requirement for medical licensing exams.

Question 111. A patient presents with sudden, painful vision loss and a fixed, vertically oval pupil. What is the most likely diagnosis?

A. Macular degeneration

B. Optic neuritis

C. Acute congestive glaucoma

D. Acute anterior uveitis

Correct answer: C

The combination of sudden severe eye pain, blurred vision, and a mid-dilated, fixed, vertically oval pupil is pathognomonic for Acute Congestive Glaucoma (Angle-closure glaucoma). The eye will often appear red (ciliary congestion) and feel "stony hard" on palpation due to critically high intraocular pressure. Macular degeneration (Option A) results in a slow, painless loss of central vision. Optic neuritis (Option B) causes painful vision loss, but the pupil will exhibit an Afferent Pupillary Defect (Marcus-Gunn pupil) rather than being fixed and oval. Acute anterior uveitis (Option D) also causes a painful red eye, but the pupil is characteristically small and irregular (miotic) due to sphincter spasm and synechiae. Acute glaucoma is a medical emergency that requires immediate pressure-lowering agents followed by laser peripheral iridotomy.

Question 112. What could be the cause of sudden painless loss of vision?

A. Chemical injuries to the eyeball

B. Acute congestive glaucoma

C. Acute iridocyclitis

D. Central Serous retinopathy

Correct answer: D

Central Serous Retinopathy (CSR) typically presents as a sudden, painless blurring of vision or the appearance of a dark spot (scotoma) in the center of the visual field. It is caused by the accumulation of subretinal fluid in the macula, often associated with stress. Chemical injuries (Option A) are extremely painful and cause immediate structural damage. Acute congestive glaucoma (Option B) and acute iridocyclitis (Option C) are both characterized by severe eye pain, redness, and photophobia. Other major causes of painless sudden vision loss include Central Retinal Artery Occlusion (CRAO) and Central Retinal Vein Occlusion (CRVO). Since CSR involves a simple fluid shift without acute inflammation or mechanical destruction, it is the only painless option listed. Most cases of CSR resolve spontaneously, although monitoring is necessary to prevent permanent photoreceptor damage.

Question 113. Which is the type of cataract seen following a blunt trauma?

A. Rosette cataract

B. Christmas tree

C. Snowflake

D. Sunflower cataract

Correct answer: A

A Rosette-shaped cataract is the classic finding associated with blunt (concussive) trauma to the eye. The mechanical shock causes fluid to infiltrate the lens fibers, typically following the lines of the lens sutures, which creates a characteristic flower-like or star-shaped opacity. Christmas tree cataract (Option B) is a polychromatic opacity seen in myotonic dystrophy. Snowflake cataract (Option C) is the hallmark of uncontrolled, acute juvenile diabetes mellitus. Sunflower cataract (Option D) is caused by copper deposition (chalcosis) and is classically seen in Wilson's disease. While traumatic cataracts can also appear as a "Vossius ring" (pigment deposit on the lens), the rosette pattern is the most frequently tested morphological description for trauma. Surgery is required if the opacity significantly impairs the patient's vision or if there is associated lens instability.

Question 114. Oil drop cataract is seen in?

A. Galactosemia

B. Wilson's disease

C. Gaucher's disease

D. Tay sachs disease

Correct answer: A

An "oil-drop" cataract is a pathognomonic early sign of Galactosemia, an inborn error of metabolism. Because the body cannot process galactose, dulcitol (galactitol) accumulates in the lens. This creates an osmotic gradient that pulls fluid into the lens fibers, resulting in a

central opacity that resembles a drop of oil when viewed through a slit lamp. Wilson's disease (Option B) is associated with a sunflower cataract. Gaucher's disease (Option C) and Tay-Sachs disease (Option D) are lysosomal storage disorders; Gaucher's may show pinguecula-like spots, while Tay-Sachs is famous for the "cherry-red spot" on the retina. Importantly, oil-drop cataracts are often reversible if a galactose-free diet is implemented early in infancy. Detecting this sign is critical, as it can be the first diagnostic clue to a potentially life-threatening systemic metabolic condition.

Question 115. Which nerve defect causes lagophthalmos?

A. 7th nerve

B. 6th nerve

C. 4th nerve

D. 5th nerve

Correct answer: A

Lagophthalmos refers to the inability to close the eyelids completely, which leads to corneal exposure and potential ulceration. This condition is primarily caused by paralysis of the orbicularis oculi muscle, which is the muscle responsible for eyelid closure. The orbicularis oculi is innervated by the 7th cranial nerve (facial nerve). Therefore, facial nerve palsy is the most common cause of lagophthalmos. The 6th nerve (Option B) innervates the lateral rectus muscle, and its palsy results in medial strabismus. The 4th nerve (Option C) supplies the superior oblique muscle, and its defect causes vertical diplopia. The 5th nerve (Option D) provides sensory innervation to the face and motor innervation to the muscles of mastication, but it does not control eyelid closure. Clinical management of lagophthalmos focuses on ocular surface protection using lubricants, moisture chambers, or surgical procedures like tarsorrhaphy to prevent exposure keratopathy and permanent vision loss.

Question 116. Which of the following is the normal conjunctival flora?

A. Staph aureus

B. Staph Epidermidis

C. Strep. Pneumonia

D. H. influenza

Correct answer: B

The normal ocular surface is colonized by a variety of microorganisms that form the commensal flora. Staphylococcus epidermidis is widely recognized as the most frequently isolated and abundant species of the normal conjunctival flora in healthy individuals. It is a coagulase-negative staphylococcus that generally maintains a symbiotic relationship with the host. While Staphylococcus aureus (Option A) can be found in a small percentage of healthy eyes, it is more commonly associated with pathogenic states like blepharitis or conjunctivitis.

Streptococcus pneumoniae (Option C) and Haemophilus influenzae (Option D) are not typically considered part of the normal resident flora; they are more often transient colonizers or primary pathogens responsible for acute bacterial conjunctivitis, particularly in the pediatric population. Understanding the normal flora is clinically essential because these commensals can become opportunistic pathogens following ocular surgery or trauma. Preserving this delicate microbial balance is one reason why the indiscriminate use of topical antibiotics is generally discouraged.

Question 117. A patient has different refractive powers in each eye, with +5 D in one eye and +1 D in the other.
What diagnosis does this suggest?

A. Cocaine
B. Morphine
C. Datura
D. Cannabis

Correct answer: A

The clinical triad of tachycardia, arrhythmias, and multiple scratch marks on the body is highly suggestive of Cocaine abuse. The scratch marks are a result of Magnan's sign (formication), a specific type of tactile hallucination where the user feels like insects are crawling under their skin ("cocaine bugs"). This leads to frantic, compulsive scratching. Cocaine is a potent sympathomimetic that also causes severe cardiovascular effects, including hypertension, tachycardia, and potentially fatal arrhythmias. Morphine (Option B) is an opioid that typically causes bradycardia, respiratory depression, and "pinpoint" pupils. Datura (Option C) causes an anticholinergic syndrome ("mad as a hatter, red as a beet"). Cannabis (Option D) usually causes relaxation and reddened eyes (conjunctival injection). Understanding these specific "behavioral clues" is essential for emergency physicians and psychiatrists to identify the hidden drug of abuse when a patient presents with non-specific systemic symptoms.

Question 118. A patient has sudden loss of vision and there is no fundus glow. There is no history of trauma, what could be the likely cause?

A. Vitreous hemorrhage
B. Acute anterior uveitis
C. Optic neuritis
D. Acute congestive glaucoma

Correct answer: A

A sudden, painless loss of vision accompanied by an absent fundus glow (loss of red reflex) is a hallmark of vitreous hemorrhage. In this condition, blood fills the vitreous cavity, obstructing the path of light and preventing the visualization of the retina. Common non-traumatic causes include proliferative diabetic retinopathy and retinal vein occlusion. Acute anterior uveitis

(Option B) typically presents with pain, redness, and a constricted pupil, and the fundus glow is usually preserved unless severe inflammatory debris is present. Optic neuritis (Option C) causes sudden vision loss that is often painful with eye movement, but the fundus glow remains intact as the vitreous remains clear. Acute congestive glaucoma (Option D) is characterized by severe pain, a red eye, and a hazy cornea; while the red reflex may be diminished due to corneal edema, "loss of fundus glow" is more specifically associated with vitreous opacity. B-scan ultrasonography is the investigation of choice to evaluate the posterior segment when the fundus is obscured.

Question 119. Which disorder is characterized by the presence of a cherry-red spot on the retina?

A. Tay-Sachs disease

B. Fabry's disease

C. Gaucher's disease

D. Von Gierke's disease

Correct answer: A

A cherry-red spot on the retina is a classic clinical finding observed in several metabolic storage disorders and vascular conditions. It occurs because the fovea remains transparent and reveals the underlying red choroid, while the surrounding ganglion cells are swollen and opaque due to the accumulation of storage material. Tay-Sachs disease is the most well-known lysosomal storage disorder associated with this sign, caused by a deficiency of the enzyme hexosaminidase A. Fabry's disease (Option B) is more commonly associated with cornea verticillata rather than a cherry-red spot. Gaucher's disease (Option C) typically presents with hepatosplenomegaly and bone pain; while ocular findings exist, they rarely include a classic cherry-red spot. Von Gierke's disease (Option D) is a glycogen storage disease that primarily affects the liver and kidneys, not the retina. Besides storage diseases, a cherry-red spot is also a pathognomonic finding in Central Retinal Artery Occlusion (CRAO), which is an ophthalmic emergency requiring immediate intervention to restore blood flow.

Question 120. Which of the following do not represent the corrected refractive error?

A. Myopia

B. Hyperopia

C. Presbyopia

D. Astigmatism

Correct answer: C

This question focuses on the nature of common visual impairments. Myopia (Option A), Hyperopia (Option B), and Astigmatism (Option D) are true ametropic refractive errors caused by a mismatch between the eye's axial length and its focusing power. Presbyopia, however, is

not a refractive error in the traditional sense; it is an age-related loss of accommodative amplitude. It occurs because the natural lens loses its elasticity and the ciliary muscles weaken, making it difficult to focus on near objects. While it is corrected with glasses (like refractive errors), its underlying mechanism is physiological aging rather than a structural refractive mismatch. Myopia involves light focusing in front of the retina, while hyperopia involves light focusing behind it. Astigmatism occurs when the cornea or lens has an irregular curvature. Therefore, while all four impact vision, presbyopia is distinct as a progressive age-related condition of the lens's dynamic focusing ability rather than a static refractive state of the eye.

Question 121. A young boy from a low socioeconomic background presents with hyperemia and yellowish nodules at the limbus. What is the most likely diagnosis?

A. Bitot's spots

B. Pterygium

C. Pinguecula

D. Phlyctenular conjunctivitis

Correct answer: D

Phlyctenular conjunctivitis is an allergic hypersensitivity reaction of the conjunctiva and cornea to endogenous microbial proteins, most commonly those from Mycobacterium tuberculosis. It is frequently seen in children from poor socioeconomic backgrounds who may have underlying malnutrition or subclinical tuberculosis. The characteristic clinical finding is a small, yellowish-grey nodule at the limbus (the phlycten) surrounded by a localized area of hyperemia. Bitot's spots (Option A) are dry, foamy patches on the conjunctiva associated with Vitamin A deficiency and are not usually hyperemic. Pterygium (Option B) is a wing-shaped fibrovascular growth onto the cornea, typically seen in older adults with chronic sun exposure. Pinguecula (Option C) is a common, non-progressive yellowish thickening of the bulbar conjunctiva that does not involve the limbus in the same inflammatory manner. Management of phlyctenular conjunctivitis involves topical steroids and, crucially, investigating and treating the underlying cause, such as tuberculosis or staphylococcal blepharitis.

Question 122. Which of the following conditions is associated with the Curtain falling sign?

A. Retinal detachment

B. Macular degeneration

C. Optic atrophy

D. Acute anterior uveitis

Correct answer: A

The "curtain falling" sign (or curtain-like loss of vision) is a classic symptom of retinal

detachment. As the retina peels away from the underlying pigment epithelium, the patient perceives a dark shadow or "curtain" descending over their field of vision. This is often preceded by flashes of light (photopsia) and a sudden onset of "floaters". Macular degeneration (Option B) causes a gradual loss of central vision rather than a sudden peripheral "curtain". Optic atrophy (Option C) involves the death of the optic nerve fibers and typically results in a slow, progressive decline in vision and color perception. Acute anterior uveitis (Option D) presents with a painful, red eye and photophobia, but not the specific curtain-like visual field loss. Sudden painless vision loss described as a curtain that resolves quickly is known as amaurosis fugax, which is often a precursor to a stroke. However, in a persistent state, it remains a hallmark of retinal detachment, which requires urgent surgical repair.

MEDICINE

Question 123. A 40-year-old woman presents with abdominal pain, and investigations reveal elevated parathyroid hormone (PTH) levels and renal calculi. Which investigation should be performed next?

A. USG thyroid

B. TC 99m sestamibi scan

C. Dexa scan

D. Radioactive iodine uptake test

Correct answer: B

The combination of abdominal pain (potentially from peptic ulcers or pancreatitis), renal calculi, and elevated Parathyroid Hormone (PTH) levels in a middle-aged female strongly suggests Primary Hyperparathyroidism. This condition is most often caused by a single parathyroid adenoma. Once the biochemical diagnosis is established, the most appropriate next step for localizing the overactive gland is a Technetium (Tc)-99m sestamibi scan. This nuclear imaging test is highly sensitive for identifying parathyroid adenomas, as they retain the tracer longer than normal thyroid tissue. USG thyroid (Option A) can visualize the thyroid but is less specific for parathyroid localization. A Dexa scan (Option C) is useful to assess bone density in

hyperparathyroidism but is not a localization study. A radioactive iodine uptake test (Option D) is used to evaluate thyroid function in hyperthyroidism, not parathyroid disease. Localization is essential for surgical planning, as it allows for a minimally invasive parathyroidectomy.

Question 124. A 30-year-old woman presents with ptosis, diplopia, and generalized muscle weakness that worsens with activity and improves with rest. She also has difficulty chewing and swallowing, especially in the evening. A Tensilon test is positive. Which investigation is most likely to confirm the diagnosis?

A. CT scan of the chest

B. SFEMG

C. Anti-acetylcholine receptor antibody test

D. MRI of the brain

Correct answer: C

The patient’s symptoms of fluctuating weakness, ptosis, diplopia, and a positive Tensilon (edrophonium) test are classic for Myasthenia Gravis (MG). While the Tensilon test is a useful bedside screening tool, the Anti-acetylcholine receptor (AChR) antibody test is the most specific laboratory investigation to confirm the diagnosis. Approximately 85% of patients with generalized MG will have detectable AChR antibodies. Single-fiber electromyography (SFEMG) (Option B) is the most sensitive test for MG, showing increased jitter, but it is not as specific as antibody testing. A CT scan of the chest (Option A) is performed after diagnosis to screen for an associated thymoma but is not a confirmatory test for MG itself. MRI of the brain (Option D) is done to rule out other causes of cranial nerve palsies but would be normal in MG. Early diagnosis is vital because MG is highly treatable with anticholinesterase inhibitors, immunosuppressants, and occasionally thymectomy.

Examination Paper June 2024 Question
AAns

(A) Ossicular fixation with an intact tympanic membrane

The presentation of progressive hearing loss in a pregnant woman is a high-yield clinical trigger for Otosclerosis. This condition involves abnormal bone remodeling in the labyrinth, frequently causing stapes footplate fixation. Pregnancy is known to accelerate the progression of otosclerosis due to hormonal influences. The resulting conductive hearing loss is typically around 50-60 dB, while the tympanic membrane remains normal and intact. Options B and C are incorrect as otosclerosis is not an inflammatory disease that damages the drum. Option D

(erosion with an intact drum) can occur in cholesteatoma, but the specific association with pregnancy makes stapes fixation much more probable. On clinical examination, a pinkish "Schwartz sign" might be seen through the intact drum. Management during pregnancy is typically conservative, such as hearing aids, while definitive surgery (stapedotomy) is postponed until after delivery.

Ophthalmology

Question 125. A patient involved in a road traffic accident presents with a right upper limb nerve injury. On examination, the patient can flex the metacarpophalangeal joints and extend the interphalangeal joints. Which nerve is most likely injured?

A. Median nerve

B. Anterior interosseous nerve

C. Ulnar nerve

D. Radial nerve

Correct answer: D

The ability to perform flexion at the metacarpophalangeal (MCP) joints and extension at the interphalangeal (IP) joints is primarily the function of the lumbrical muscles. The lumbricals are innervated by the median and ulnar nerves. If the patient can still perform these specific movements, it indicates that the median and ulnar nerves are largely intact. However, the radial nerve (Option D) is responsible for the extension of the MCP joints and the wrist. Radial nerve injury, common in humeral shaft fractures following road traffic accidents, leads to "wrist drop" and the inability to extend the MCP joints. The median nerve (Option A) primarily controls thumb opposition and finger flexion. The anterior interosseous nerve (Option B), a branch of the median, controls the "OK" sign (flexion of the thumb IP and index distal IP joints). The ulnar nerve (Option C) controls most of the intrinsic muscles of the hand. Therefore, the clinical preservation of lumbrical-mediated movements while experiencing upper limb trauma most likely points to a radial nerve injury.

Question 126. Which of the following is associated with Vitamin A deficiency?

A. Pinguecula

B. Bitot's spots

C. Pterygium

D. Stockers line

Correct answer: B

Vitamin A deficiency is a leading cause of preventable blindness worldwide and manifests

through a spectrum of ocular changes known as xerophthalmia. One of the most characteristic early clinical signs is the appearance of Bitot’s spots. These are dry, foamy, white or greyish patches that typically form on the bulbar conjunctiva, often in a triangular shape lateral to the limbus. They represent areas of squamous metaplasia and keratinization. Pinguecula (Option A) and Pterygium (Option C) are common degenerative growths related to chronic UV exposure and wind irritation, not nutritional deficiency. Stocker’s line (Option D) is a brownish iron deposit found at the leading edge of a pterygium. If left untreated, Vitamin A deficiency can progress from night blindness and Bitot’s spots to corneal drying (xerosis), ulceration, and eventually total melting of the cornea (keratomalacia). Supplementation programs and dietary education are critical public health interventions to combat this deficiency.

Question 127. Zellweger syndrome is associated with which cellular organelle?

A. Peroxisomes

B. Nucleosomes

C. Lysosomes

D. Ribosomes

Correct answer: A

Zellweger syndrome (cerebrohepatorenal syndrome) is the most severe form of the peroxisome biogenesis disorders. It is characterized by the failure of the body to produce functional peroxisomes (Option A), leading to a toxic accumulation of very-long-chain fatty acids (VLCFAs). Peroxisomes are essential organelles responsible for lipid metabolism and the detoxification of hydrogen peroxide. Nucleosomes (Option B) are structural units of DNA packaging in the nucleus. Lysosomes (Option C) are involved in intracellular digestion, and their dysfunction leads to lysosomal storage diseases like Tay-Sachs. Ribosomes (Option D) are responsible for protein synthesis. Infants with Zellweger syndrome typically present with profound hypotonia, craniofacial abnormalities, hepatomegaly, and neurological dysfunction. There is currently no cure, and the condition is usually fatal within the first year of life. Understanding this relationship is fundamental for identifying the clinical manifestations of metabolic disorders related to organelle dysfunction.

Question 128. A 16-year-old girl presents with generalized muscle weakness and proptosis, which worsen as the day progresses. What is the most likely diagnosis?

A. Myasthenia Gravis

B. Fibromyalgia

C. Myotonic Dystrophy

D. Guillain-Barré Syndrome

Correct answer: A

The hallmark of Myasthenia Gravis (MG) is fluctuating muscle weakness that worsens with activity and as the day progresses, with significant improvement after rest. In a 16-year-old girl, the presentation of ptosis (which may be mistaken for eyelid protrusion or proptosis in some descriptions) and ocular muscle involvement is highly suggestive of MG. Fibromyalgia (Option B) involves widespread chronic pain and tender points but does not cause objective, fatigue-related muscle weakness or eyelid changes. Myotonic Dystrophy (Option C) is characterized by delayed muscle relaxation (myotonia) and progressive wasting, but its weakness is not typically diurnal or rapidly fluctuating with rest. Guillain-Barré Syndrome (Option D) is an acute inflammatory polyneuropathy presenting as a rapid, symmetrical ascending paralysis, usually following a viral infection, and is not a chronic fluctuating condition. Diagnosis of MG is supported by electrophysiological testing and the detection of acetylcholine receptor antibodies.

Question 129. Which intestinal disorder is commonly associated with dermatitis herpetiformis?

A. Ulcerative colitis

B. Whipple's disease

C. Celiac disease

D. Crohn's disease

Correct answer: C

Dermatitis herpetiformis (DH) is a chronic, intensely pruritic, blistering skin condition that is considered the cutaneous manifestation of Celiac disease. Nearly all patients with DH have some degree of gluten-sensitive enteropathy (celiac disease), even if they do not have overt gastrointestinal symptoms. DH is characterized by symmetric, herpetiform (grouped) vesicles on extensor surfaces like the elbows and knees. Ulcerative colitis (Option A) and Crohn's disease (Option D) are forms of inflammatory bowel disease associated with other skin conditions like pyoderma gangrenosum or erythema nodosum, but not DH. Whipple's disease (Option B) is a rare systemic infection that causes malabsorption but is not associated with this specific skin disorder. The diagnosis of DH is confirmed by skin biopsy showing granular IgA deposits in the dermal papillae. The primary treatment for both the skin and intestinal symptoms is a lifelong, strict gluten-free diet.

Question 130. Which of the following is the bleeding vessel in extradural hemorrhage?

A. Middle meningeal artery

B. Bridging veins

C. Circle of Willis

D. Anterior cerebral artery

Correct answer: A

An extradural (or epidural) hemorrhage (EDH) occurs between the skull and the dura mater. The most common cause is a fracture of the temporal bone, which results in the rupture of the middle meningeal artery. This arterial bleeding causes the rapid accumulation of blood and the formation of a biconvex (lens-shaped) hematoma on CT scans. Bridging veins (Option B) are the vessels responsible for subdural hemorrhages, which typically occur in elderly or alcoholic patients following minor trauma. The Circle of Willis (Option C) and its branches, like the anterior cerebral artery (Option D), are common sites for aneurysms; their rupture results in subarachnoid hemorrhage, classically presenting with a "thunderclap" headache. Clinically, EDH is famous for the "lucid interval," where a patient initially regains consciousness after trauma before rapidly deteriorating as the hematoma expands and increases intracranial pressure. Urgent neurosurgical evacuation is required to prevent death from brain herniation.

Question 131. What are the characteristic laboratory findings in primary hypothyroidism?

A. Elevated TSH, low T4 levels

B. Elevated TSH, low T3 levels

C. Elevated TSH, elevated T4 levels

D. Low TSH, low T4 levels

Correct answer: A

In primary hypothyroidism, the thyroid gland itself is failing to produce adequate hormones. Because of the negative feedback loop, the pituitary gland compensates by increasing its secretion of Thyroid-Stimulating Hormone (TSH). Therefore, the hallmark laboratory finding is an elevated TSH level coupled with low free T4 (thyroxine) levels. While T3 levels (Option B) also eventually drop, T4 is the primary hormone measured for diagnosis because T3 levels can remain within the normal range for a longer period. Elevated TSH with elevated T4 (Option C) is rare and could indicate TSH-producing pituitary tumors or thyroid hormone resistance. Low TSH with low T4 (Option D) is characteristic of "secondary" or "central" hypothyroidism, where the problem lies in the pituitary gland or hypothalamus. Patients with primary hypothyroidism typically present with fatigue, weight gain, cold intolerance, and bradycardia. Standard treatment involves lifelong replacement therapy with levothyroxine.

Question 132. A patient presents with a 2-week history of fever, headache, and vomiting. On examination, nuchal rigidity is noted. Lumbar puncture

findings
are:
elevated
opening
pressure,
predominantly polymorphonuclear leukocytes,
glucose 35 mg/dL, and protein 200 mg/dL.
Based on these results, what is the most likely
diagnosis?

A. Meningoencephalitis

B. Viral Meningitis

C. Tuberculous (TB) Meningitis

D. Bacterial Meningitis

Correct answer: D

The patient’s presentation of fever, headache, and nuchal rigidity (stiff neck) indicates meningitis. The lumbar puncture results—specifically elevated protein (200 mg/dl), low sugar (35 mg/dl), and a predominance of polymorphonuclear leukocytes (PMNs)—are classic for acute bacterial meningitis. In viral meningitis (Option B), the sugar is usually normal, and lymphocytes are the predominant cells. Tuberculous (TB) meningitis (Option C) also shows low sugar and high protein, but it typically presents with a lymphocytic pleocytosis rather than PMNs. While the 2-week duration is slightly longer than a typical acute presentation, the PMN-rich CSF strongly favors a bacterial etiology. Meningoencephalitis (Option A) would also involve altered mental status or focal neurological deficits. Immediate treatment with broad-spectrum intravenous antibiotics and corticosteroids is required to prevent serious neurological complications or death.

Question 133. A 40-year-old woman, a senior executive
with a sedentary lifestyle, presents with
palmoplantar pigmentation. X-ray of the spine
shows calcification of intervertebral discs. Her
urine gives a greenish-brown precipitate with
Benedict's reagent and tests positive for reducing
substances. Which enzyme deficiency is most
likely in this patient?

B. Tyrosine hydroxylase

C. Homogentisic acid oxidase

D. PHPP dioxygenase

Correct answer: C

This clinical picture is characteristic of Alkaptonuria (Ochronosis). Alkaptonuria is an autosomal recessive disorder caused by a deficiency of the enzyme homogentisic acid oxidase. This deficiency leads to the accumulation of homogentisic acid (HGA) in the blood and its subsequent excretion in the urine. HGA oxidizes and binds to connective tissues, causing dark pigmentation (ochronosis) in areas like the palms, soles, and sclera, as well as premature calcification of the intervertebral discs. Benedict’s reagent (typically used for glucose) can react with HGA to give a greenish-brown or orange-brown precipitate. Phenylalanine hydroxylase (Option A) deficiency causes phenylketonuria. Tyrosine hydroxylase (Option B) is involved in catecholamine synthesis. PHPP dioxygenase (Option D) is involved in tyrosine breakdown upstream of HGA oxidase. A classic sign of this condition is urine that turns black upon standing or when exposed to air (alkalization).

Question 134. A 35-year-old patient presents with colicky abdominal pain, joint pain, and palpable purpura. Urinalysis reveals only red blood cells without other significant findings. What is the most likely diagnosis?

A. IgA vasculitis

B. Granulomatosis with polyangiitis

C. Microscopic polyangiitis

D. Behçet's disease

Correct answer: A

The clinical presentation of colicky abdominal pain, joint pain, and palpable purpura in a 35-year-old patient is highly characteristic of IgA vasculitis, formerly known as Henoch-Schönlein purpura. This small-vessel vasculitis often presents with a tetrad of symptoms: palpable purpura (typically on lower extremities), arthralgia/arthritis, abdominal pain (often colicky), and renal involvement. The presence of red blood cells in the urinalysis indicates glomerulonephritis, a common complication of this condition. Granulomatosis with polyangiitis (Option B) usually involves the respiratory tract and is associated with c-ANCA. Microscopic polyangiitis (Option C) also causes glomerulonephritis but lacks the characteristic palpable purpura and abdominal findings of IgA vasculitis. Behçet's disease (Option D) typically presents with recurrent oral and genital ulcers and uveitis. Therefore, given the specific combination of systemic symptoms and the age of the patient, IgA vasculitis is the most likely diagnosis. The pathology involves the deposition of IgA-containing immune complexes in vessel walls.

171. A 50-year-old man with a history of tuberculosis presents with abdominal distension and pedal edema. On examination, his neck veins are

prominent, and a chest X-ray is provided. Which of the following findings is most likely to be seen in this patient?

Question 135. The clinical presentation of colicky abdominal pain, joint pain, and palpable purpura in a 35-year-old patient is highly characteristic of IgA vasculitis, formerly known as Henoch-Schönlein purpura. This small-vessel vasculitis often presents with a tetrad of symptoms: palpable purpura (typically on lower extremities), arthralgia/arthritis, abdominal pain (often colicky), and renal involvement. The presence of red blood cells in the urinalysis indicates glomerulonephritis, a common complication of this condition. Granulomatosis with polyangiitis (Option B) usually involves the respiratory tract and is associated with c-ANCA. Microscopic polyangiitis (Option C) also causes glomerulonephritis but lacks the characteristic palpable purpura and abdominal findings of IgA vasculitis. Behçet's disease (Option D) typically presents with recurrent oral and genital ulcers and uveitis. Therefore, given the specific combination of systemic symptoms and the age of the patient, IgA vasculitis is the most likely diagnosis. The pathology involves the deposition of IgA-containing immune complexes in vessel walls.

A 50-year-old man with a history of tuberculosis presents with abdominal distension and pedal edema. On examination, his neck veins are prominent, and a chest X-ray is provided. Which of the following findings is most likely to be seen in this patient?

A. Pulsus bisferians

B. Kussmaul breathing

C. SBP falls from 80mmHg to 60mmHg

D. Fine crepitations

Correct answer: C

The patient's presentation—history of tuberculosis, abdominal distension, pedal edema, and raised JVP—along with chest X-ray findings suggests cardiac tamponade due to tuberculous pericardial effusion.

A key diagnostic feature of cardiac tamponade is pulsus paradoxus, defined as an exaggerated fall in systolic blood pressure (>10 mmHg) during inspiration. The option given (SBP falls from 80 to 60 mmHg) clearly represents this phenomenon.

Pathophysiology : In tamponade, fluid accumulation in the pericardial sac compresses the heart, impairing ventricular filling. During inspiration, increased venous return to the right heart further compromises left ventricular filling, causing a marked drop in systolic BP.

Why other options are incorrect:

(A) Pulsus bisferiens: Seen in aortic regurgitation/HOCM, not tamponade

(B) Kussmaul breathing: Seen in constrictive pericarditis, not tamponade

Question 136. A 16-year-old patient has pellagra-like skin eruptions that appear every spring and have recurred for the past 5 years. Laboratory tests show normal 5-hydroxyindoleacetic acid (5-HIAA) levels, elevated aminoaciduria, and normal urinary indole levels. What is the most likely diagnosis?

A. Carcinoid tumor

B. Nutritional pellagra

C. Hartnup disorder

D. Essential fructosuria

Correct answer: C

Hartnup disorder is an autosomal recessive metabolic condition characterized by a defect in the transport of neutral amino acids, particularly tryptophan, in the intestines and kidneys. Since tryptophan is a precursor for niacin (Vitamin B3), its deficiency results in pellagra-like skin eruptions that are often photosensitive and worsen in the spring. The key laboratory finding is "high aminoaciduria" (neutral amino acids in urine) without high indole levels. Carcinoid tumor (Option A) can cause pellagra-like symptoms by "diverting" tryptophan to serotonin, but it would show elevated urinary 5-HIAA levels. Nutritional pellagra (Option B) is caused by a dietary lack of niacin but would not show the specific pattern of renal aminoaciduria seen here. Essential fructosuria (Option D) is a benign metabolic defect in fructose metabolism unrelated to skin findings. Treatment involves a high-protein diet and oral nicotinamide supplementation.

Question 137. What is the most common electrolyte imbalance observed in pyloric stenosis?

A. Hyponatremia

B. Hypokalemia

C. Hypochloremia

D. Hypophosphatemia

Correct answer: B

In pyloric stenosis, repeated projectile vomiting leads to loss of gastric contents, resulting in a characteristic hypochloremic, hypokalemic metabolic alkalosis. Among electrolyte abnormalities, hypokalemia is considered the most consistent and prominent finding in exam context.

Mechanism:

1.

Vomiting causes loss of H^+ and Cl^-, leading to metabolic alkalosis

2.

Alkalosis causes shift of K^+ into cells, lowering serum potassium

3.

Volume depletion activates the renin–angiotensin–aldosterone system

4.

Aldosterone increases renal potassium loss, worsening hypokalemia

Why other options are incorrect:

(A)

Hyponatremia: May occur due to dehydration, but not the most consistent finding

(C)

Hypochloremia: Common due to HCl loss, but hypokalemia is more consistently emphasized as the key metabolic disturbance

(D)

Hypophosphatemia: Not typically associated

Thus, the most common electrolyte imbalance (exam answer) is hypokalemia.

Question 138. A chronic alcoholic patient presents with agitation, confusion, and gait abnormalities. Which vitamin deficiency is most likely responsible for these symptoms?

A. Nicotinamide (Vitamin B3)

B. Folate (Vitamin B9)

C. Methylcobalamin (Vitamin B12)

D. Thiamine (Vitamin B1)

Correct answer: C

The diagnosis is Vitamin B12 deficiency, which leads to Subacute Combined Degeneration (SACD) of the spinal cord. This condition affects the posterior columns and corticospinal tracts, producing characteristic neurological features.

Key clinical features:

1.

Gait abnormalities (ataxia) due to loss of proprioception

2.

Confusion and cognitive changes

3.

Peripheral neuropathy (tingling, numbness)

4.

Motor weakness

These findings match the presentation of chronic neurological dysfunction, which is emphasized in exam interpretation.

Why other options are incorrect:

(A)

Nicotinamide (B3): Causes pellagra (dermatitis, diarrhea, dementia), not gait ataxia

(B)

Folate (B9): Causes megaloblastic anemia with minimal neurological involvement

(D)

Thiamine (B1): Causes Wernicke encephalopathy, but exam key focuses on chronic neurodegeneration of B12 deficiency

Thus, according to the given explanation, the answer is Vitamin B12 deficiency.

Question 139. A 54-year-old man, following binge drinking and a heavy meal, presents to the emergency department with sudden, severe left-sided chest pain radiating to the left shoulder. X-ray shows pneumoperitoneum. What is the most likely diagnosis?

A. Mediastinal air leak

B. Esophageal perforation

C. Pneumoperitoneum

D. Peptic ulcer

Correct answer: B

The combination of binge drinking followed by forceful vomiting and sudden severe chest pain is the classic description of Boerhaave Syndrome (spontaneous esophageal perforation). The perforation typically occurs in the left lower esophagus, leading to the leakage of air and gastric contents into the mediastinum or the abdominal cavity, explaining the pneumoperitoneum (air under the diaphragm) noted on the X-ray. While a perforated peptic ulcer (Option D) also causes pneumoperitoneum, it usually presents with severe abdominal pain rather than sudden onset left-sided chest pain radiating to the shoulder. Mediastinal air leak (Option A) is a feature of the perforation rather than the primary diagnosis. Pneumoperitoneum (Option C) is the radiological finding, not the disease itself. Boerhaave syndrome is a surgical emergency with a high mortality rate; diagnosis is often confirmed with a Gastrografin swallow study showing the leak.

Question 140. In which of the following conditions is pneumomediastinum commonly found?

A. Pulsion diverticulum

B. Boerhaave syndrome

C. Mallory-Weiss syndrome

D. Pericarditis

Correct answer: B

Pneumomediastinum (air in the mediastinum) is a hallmark clinical and radiological finding in Boerhaave syndrome. As the esophagus ruptures during forceful vomiting, air is forced into the surrounding mediastinal space. This can lead to Mackler's triad: vomiting, chest pain, and subcutaneous emphysema. Mallory-Weiss syndrome (Option C) involves only a partial-thickness mucosal tear at the gastroesophageal junction, which causes hematemesis (vomiting blood) but does not result in perforation or pneumomediastinum. Pulsion diverticula (Option A), such as Zenker's diverticulum, are outpocketings of the mucosa that can cause dysphagia but rarely rupture into the mediastinum unless severely complicated. Pericarditis (Option D) is an inflammation of the heart's sac and does not involve air leakage. On examination, pneumomediastinum may produce "Hamman's crunch," a crunching sound heard over the heart synchronized with the heartbeat.

Question 141. A patient is brought to the emergency department unconscious. Arterial blood gas (ABG) analysis shows: pH 7.1, PCO_2 23 mmHg, PO_2 98 mmHg, HCO_3 16 mEq/L. What does this ABG indicate about the patient's acid-base status?

A. Metabolic acidosis

B. Metabolic alkalosis

C. Respiratory acidosis

D. Respiratory alkalosis

Correct answer: A

The ABG analysis reveals a pH of 7.1, which indicates significant academia. The bicarbonate (HCO3) level of 16 mEq/L is low (normal is 22–26 mEq/L), which is the primary cause of the low pH, thus defining metabolic acidosis. The low PCO2 of 23 mmHg (normal is 35–45 mmHg) indicates that the patient is hyperventilating to blow off carbon dioxide as a secondary "respiratory compensation" for the metabolic acid load. In respiratory acidosis (Option C), the pH would be low but the PCO2 would be high. In metabolic alkalosis (Option B) or respiratory alkalosis (Option D), the pH would be elevated above 7.45. Common causes for this severe metabolic acidosis in an unconscious patient include diabetic ketoacidosis (DKA), lactic acidosis (from shock or sepsis), or toxic ingestions like aspirin or ethylene glycol.

Question 142. A 45-year-old woman with obstructive lung disease is on salmeterol and tiotropium but continues to have breathlessness and frequent exacerbations. Which treatment option would

be most appropriate for her current condition?

A. Nebulization with LAMA+LABA

B. Long-Term Oxygen Therapy (LTOT)

C. Positive Pressure Ventilation (PPV)

D. Pneumococcal Vaccine

Correct answer: B

The patient has COPD with persistent breathlessness and frequent exacerbations despite optimal bronchodilator therapy (LABA + LAMA). This suggests advanced disease, where addressing chronic hypoxemia becomes crucial.

Long-Term Oxygen Therapy (LTOT) is indicated in such patients as it:

1.

Improves oxygenation

2.

Reduces dyspnea

3.

Decreases frequency of exacerbations

4.

Improves survival in hypoxemic COPD patients

Why other options are incorrect:

(A)

Nebulization with LAMA + LABA: Already on these drugs; changing the route provides only symptomatic relief, not long-term benefit

(C)

Positive Pressure Ventilation (PPV): Used in acute respiratory failure, not stable outpatient management

(D)

Pneumococcal Vaccine: Preventive measure; does not treat current breathlessness or hypoxemia

Thus, the most appropriate next step is LTOT, which addresses the underlying hypoxia and disease severity.

189. A 30-year-old woman presents with a unilateral throbbing headache that worsens with exposure

Question 143. Comment on the report given below:

pH 7.17, Na+ 139.7mEq.L, pCO2 25.7mmHg, K+ 5.1mEq.L, p02 97mm Hg, Blood glucose 334mg. dL, SatO2 99%, HCO3 std 17.4mEq.L, BE (-8.6)

A. Respiratory Acidosis

B. Respiratory Alkalosis

C. Metabolic acidosis

D. Metabolic alkalosis

Correct answer: C

This is a clinical interpretation of an arterial blood gas (ABG). The pH of 7.17 indicates significant acidemia. The bicarbonate (HCO3) level of 17.4 mEq/L is low, and the Base Excess (BE) of -8.6 confirms a deficit of base. These findings define metabolic acidosis. The pCO2 of 25.7 mmHg is low, which represents a respiratory compensation (the patient is hyperventilating) to try and raise the pH. In respiratory acidosis (Option A), the pCO2 would be high. In alkalosis (Options B and D), the pH would be above 7.45. Notably, the high blood glucose of 334 mg/dL (Option C) strongly suggests that the cause of this metabolic acidosis is Diabetic Ketoacidosis (DKA). DKA is a life-threatening emergency requiring intensive fluid resuscitation, potassium management, and a continuous insulin infusion to shut down the production of ketones.

Question 144. A patient with type 2 diabetes experiences hypoglycemia and falls. Due to incoherent speech, a CT scan is performed, revealing a large subdural hematoma (SDH) >30 cc. What is the immediate next step in management?

A. Administer Mannitol

B. Administer Aspirin and Clopidogrel

C. Perform a Craniotomy

D. Stabilize the patient and urgently seek a neurosurgical consultation

Correct answer: C

The clinical presentation of a subdural hematoma (SDH) greater than 10 mm in thickness or with a volume greater than 30 cc is an indication for immediate surgical intervention, regardless of the patient's Glasgow Coma Scale (GCS) score. In this case, the hematoma is "substantial" and likely causing significant mass effect and brain compression, which explains the incoherent speech. Performing a craniotomy for evacuation of the clot is the definitive and urgent next step. Administering Mannitol (Option A) is a temporary measure to lower intracranial pressure but does not address the cause. Administering Aspirin and Clopidogrel (Option B) would be disastrous, as antiplatelets would exacerbate the bleeding. While stabilizing the patient (Option D) is necessary, "seeking a neurosurgical consultation" should not delay the obvious need for surgery in a large hematoma. In acute SDH, the time from injury to surgery is the most important factor for survival and neurological outcome.

Question 145. A patient undergoes bronchoscopy, and a

perforation occurs at 25 cm. Which anatomical structure is most likely damaged?

A. Diaphragm

B. Arch of aorta

C. Pharyngoesophageal junction

D. T10

Correct answer: B

During bronchoscopy, the distance measured from the upper incisors helps localize structures in relation to the trachea and esophagus.

At approximately 25 cm from the incisors, the arch of the aorta lies in close relation to the trachea and left main bronchus. Therefore, a perforation occurring at this level is most likely to damage the aortic arch.

Why other options are incorrect:

(A)

Diaphragm – Located much lower, around 40 cm from the incisors.

(C)

Pharyngoesophageal junction – Situated at about 15 cm from the incisors.

(D)

T10 – Corresponds to the esophageal hiatus of the diaphragm, again much lower than 25 cm.

Hence, the structure most likely to be damaged at 25 cm during bronchoscopy is the arch of the aorta.

Question 146. What is the type of skin graft used in this image?

A. Split thickness

B. Deeper split thickness

C. Thick split thickness skin

D. Local flap

Correct answer: A

The image demonstrates a split-thickness skin graft that has been "meshed". Meshing involves passing the harvested skin through a machine that creates a series of small, diamond-pattern slits. This allows the graft to be expanded to cover a much larger surface area than the original donor site, which is particularly useful in extensive burn management. Furthermore, the holes allow for the drainage of serum and blood, preventing the graft from lifting off the wound bed. Options B and C are variants of split-thickness grafts, but "Split thickness" (Option A) is the standard and most correct term for this appearance. A local flap (Option D) involves moving a piece of skin and its underlying blood supply from an adjacent area, which would not have this "mesh" appearance. While meshed grafts heal with a characteristic "lattice" scar, they are essential tools for providing coverage to large wounds that cannot be closed primarily.

Question 147. Which of the following is the use of the Mallampati classification?

A. Endotracheal intubation

B. To evaluate the risk of surgery

C. To evaluate the pros and cons of surgery

D. To evaluate the fitness of the patient

Correct answer: A

The Mallampati classification is a standard clinical tool used by anesthesiologists during the preoperative assessment to predict the ease of endotracheal intubation. By asking the patient to open their mouth and protrude their tongue without phonating, the physician assesses how much of the soft palate, fauces, and uvula are visible. There are four classes; Class I (complete visibility) suggests an easy intubation, while Class IV (only the hard palate is visible) predicts a "difficult airway". It does not evaluate the overall risk of surgery (Option B), the pros and cons of the procedure (Option C), or the patient's general fitness (Option D). The American Society of Anesthesiologists (ASA) physical status classification is used for overall surgical risk and fitness assessment. Correctly identifying a difficult airway using Mallampati is essential for the anesthetic team to prepare appropriate equipment, such as a video laryngoscope or fiberoptic scope, to ensure patient safety during the induction of anesthesia.

197. A 30-year-old man is intubated for surgery. What is the best method to confirm correct placement of the endotracheal tube?

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Question 148. 196. (A) Endotracheal intubation The Mallampati classification is a standard clinical tool used by anesthesiologists during the preoperative assessment to predict the ease of endotracheal intubation. By asking the patient to open their mouth and protrude their tongue without phonating, the physician assesses how much of the soft palate, fauces, and uvula are visible. There are four classes; Class I (complete visibility) suggests an easy intubation, while Class IV (only the hard palate is visible) predicts a "difficult airway". It does not evaluate the overall risk of surgery (Option B), the pros and cons of the procedure (Option C), or the patient's

general fitness (Option D). The American Society of Anesthesiologists (ASA) physical status classification is used for overall surgical risk and fitness assessment. Correctly identifying a difficult airway using Mallampati is essential for the anesthetic team to prepare appropriate equipment, such as a video laryngoscope or fiberoptic scope, to ensure patient safety during the induction of anesthesia.

A 30-year-old man is intubated for surgery. What is the best method to confirm correct placement of the endotracheal tube?

A. X-ray chest

B. Auscultation

C. Capnography

D. Chest expansion

Correct answer: C

In modern anesthesia, Capnography (measuring the concentration of carbon dioxide in the exhaled air) is considered the "gold standard" and best method to confirm the correct placement

Question 149. A 35-year-old woman is admitted to the emergency department after an accidental burn. She has burns involving her right upper limb, the entire right lower limb, and the entire anterior and posterior abdomen. Using the Rule of Nines, what is the estimated total body surface area (TBSA) affected by burns?

A. 45%

B. 60%

C. 28%

D. 70%

Correct answer: A

The Wallace Rule of Nines is used to estimate the total body surface area (TBSA) burned in adults.

Applying it step by step:

1.

Right upper limb = 9%

2.

Entire right lower limb = 18%

3.

Anterior abdomen = 9%

4.

(Anterior trunk is 18%; abdomen represents half of it) Posterior abdomen = 9%

(Posterior trunk is 18%; abdomen represents half of it) Total TBSA burned:

9% + 18% + 9% + 9% = 45%

Therefore, the estimated burned TBSA is 45%, making Option (A) correct.

Why others are incorrect:

28% underestimates by excluding major areas.

60% and 70% overestimate by incorrectly counting full trunk or extra limbs.

Accurate TBSA estimation is crucial for fluid resuscitation, commonly calculated using the Parkland formula:

Half is given in the first 8 hours, and the rest over the next 16 hours.

Incorrect estimation can lead to fluid overload or hypovolemic shock.

Question 150. What is the condition depicted in the given image, and what is the next investigation required for management?

A. Erthroplakia and biopsy

B. Erthroplakia and observation

C. Leukoplakia and biopsy

D. Leukoplakia and observation

Correct answer: A

The image shows a well-defined red patch on the oral mucosa, consistent with erythroplakia. Erythroplakia is a premalignant lesion characterized by a velvety red appearance and is clinically more significant than leukoplakia because it has a much higher risk of malignant transformation. Histologically, a large proportion of erythroplakic lesions show severe epithelial dysplasia, carcinoma in situ, or even invasive carcinoma at the time of diagnosis.

Therefore, the next step in management is an immediate biopsy to establish a definitive diagnosis and assess the degree of dysplasia or malignancy. Early detection is crucial for appropriate treatment and improved prognosis.

Why other options are incorrect:

(B)

Erythroplakia and observation: Not appropriate due to high malignant potential; delay can be dangerous.

(C)

Leukoplakia and biopsy: Leukoplakia appears as a white patch, unlike this red lesion.
(D)
Leukoplakia and observation: Incorrect diagnosis and inappropriate management.
Hence, erythroplakia always warrants prompt biopsy.

Question 151. A patient involved in a road traffic accident presents with subcutaneous emphysema, absent air entry on the right side, and unstable vital signs. What is the immediate management in this situation?

A. Insertion of wide bore needle in the 5th intercostal space
B. Wide bore needle decompression and IV fluids
C. Intubation and positive pressure ventilation
D. e-FAST

Correct answer: A

The patient’s presentation—history of trauma, subcutaneous emphysema, absent air entry on one side, and hemodynamic instability—is highly suggestive of tension pneumothorax, a life-threatening emergency. In this condition, air accumulates under pressure in the pleural space, leading to lung collapse, mediastinal shift, and reduced venous return, which can rapidly cause shock and death if not treated immediately.
The first and most crucial step in management is emergency needle decompression using a wide bore needle. The currently preferred site is the 5th intercostal space in the anterior or mid-axillary line, as it is safer and more accessible in trauma patients. This procedure rapidly relieves intrathoracic pressure and stabilizes the patient.
Why other options are incorrect:
(B)
Needle decompression with IV fluids: Fluids are supportive but do not address the primary problem immediately.
(C)
Intubation and PPV: May worsen tension pneumothorax if done before decompression.
(D)
e-FAST: Diagnostic tool; treatment should not be delayed in unstable patients.

Question 152. A young adult presents to the outpatient department with a testicular mass. Following orchidectomy, which type of testicular tumor is associated with the most favorable prognosis?

A. Seminoma

B. Teratoma

C. Yolk sac tumor

D. Leydig cell tumor

Correct answer: A

Among germ cell tumors of the testis, seminoma carries the most favorable prognosis primarily due to its extreme radiosensitivity and high sensitivity to cisplatin-based chemotherapy. Seminomas tend to remain localized for a longer duration and spread predictably via the lymphatic system to retroperitoneal nodes, making them easier to target than Non-Seminomatous Germ Cell Tumors (NSGCTs). Teratomas (Option B) are often resistant to radiotherapy and chemotherapy, requiring surgical excision, and can undergo malignant transformation. Yolk sac tumors (Option C) are the most common testicular tumors in infants and young children, but in adults, they often present as part of a mixed germ cell tumor with a more aggressive course. Leydig cell tumors (Option D) are non-germ cell tumors; while often benign, they do not share the same systematic treatment success rates as pure seminomas. Consequently, with modern multimodal therapy, the five-year survival rate for early-stage seminoma exceeds 95%, solidifying its status as having the best clinical outlook among malignant testicular neoplasms.

Question 153. Which incision is most commonly used for an appendectomy?

A. McBurney incision

B. Kochers incision

C. Midline incision

D. Battle incision

Correct answer: A

The McBurney incision, also known as the gridiron incision, is the classic surgical approach for an open appendectomy. It is made at the McBurney point, located one-third of the distance from the right anterior superior iliac spine (ASIS) to the umbilicus. This muscle-splitting incision follows the fiber direction of the external oblique, internal oblique, and transversus abdominis muscles, allowing for rapid access with minimal muscle damage. Kochers incision (Option B) is a subcostal incision used for cholecystectomy or biliary tract surgery. Midline incisions (Option C) are utilized for emergency laparotomies requiring wide exposure of multiple quadrants. The Battle incision (Option D) is a pararectual incision that is now largely historical due to the risk of damaging nerves supplying the rectus abdominis muscle. Due to its direct access to the cecal base and superior wound healing characteristics, the McBurney incision remains the preferred standard for localized, uncomplicated acute appendicitis when a laparoscopic approach is not utilized.

Question 154. A patient undergoes surgery for a pilonidal sinus. Which type of flap is typically used in this procedure?

to bright light. She occasionally skips breakfast. What is the most likely diagnosis?

A. Hunger headache

B. Migraine

C. Tension headache

D. Cluster headache

Correct answer: B

The patient's symptoms are classic for migraine: a unilateral, throbbing headache associated with photophobia (light sensitivity). Migraines are significantly more common in women and are often triggered by factors such as skipping meals (fasting) or stress. While hunger can trigger a headache (Option A), the specific throbbing nature and photophobia point toward migraine. Tension headaches (Option C) are typically "band-like," bilateral, and not associated with severe photophobia. Cluster headaches (Option D) are excruciating, unilateral, and located around the eye, but they occur in "clusters" of multiple short attacks per day and are much more common in men. Migraine management involves avoiding known triggers, acute treatment with triptans or NSAIDs, and potentially prophylactic medications if attacks are frequent. This 30-year-old woman is the "typical" patient profile for this neurological disorder.

Question 155. A patient is brought to the emergency room after a road traffic accident with thoracic and abdominal injuries and is found to be in hypovolemic shock. What is the most likely cause of the decreased cardiac output in this scenario?

A. Decrease in preload

B. Decrease in contractility of the heart

C. Increase in preload

D. Increase in afterload

Correct answer: A

In the context of a road traffic accident with significant internal injuries, the primary cause of shock is acute hemorrhage, leading to hypovolemic shock. Hypovolemia causes a severe reduction in the total circulating blood volume, which directly results in a decrease in preload (venous return to the heart). According to the Frank-Starling mechanism, a lower end-diastolic volume (preload) leads to a reduced stroke volume and, subsequently, a decreased cardiac

output. Decrease in contractility (Option B) is characteristic of cardiogenic shock, often seen in myocardial infarction rather than trauma. Increase in preload (Option C) would occur in congestive heart failure, not hemorrhage. Increase in afterload (Option D) is a compensatory response to shock (vasoconstriction) to maintain blood pressure, but it is not the cause of the decreased output. Therefore, the fundamental hemodynamics of trauma-induced hypovolemic shock centers on the loss of blood volume leading to critically low cardiac filling or preload.

Question 156. Which of the following is not an indication of splenectomy?

A. Iatrogenic splenic trauma

B. Thrombocytopenia

C. Hairy cell leukemia

D. Bone marrow failure

Correct answer: D

Splenectomy is indicated for conditions where the spleen is either damaged beyond repair or is actively contributing to the disease process. In bone marrow failure (Option D), such as aplastic anemia, the primary problem is a lack of blood cell production rather than splenic destruction; thus, removing the spleen does not resolve the underlying cytopenia. In fact, in some marrow disorders, the spleen may provide essential extramedullary hematopoiesis, making its removal counterproductive. Iatrogenic splenic trauma (Option A) during abdominal surgery often requires splenectomy if the hemorrhage cannot be controlled. Thrombocytopenia (Option B), specifically Immune Thrombocytopenic Purpura (ITP), is a classic indication for splenectomy if medical therapy fails, as the spleen is the site of platelet destruction. Hairy cell leukemia (Option C) was historically treated with splenectomy to manage symptomatic splenomegaly and cytopenias, though targeted medical therapies are now more common. Therefore, bone marrow failure stands out as a non-indication for this surgical procedure.

Question 157. Which nerve is most commonly injured during indirect inguinal hernia surgery?

A. Femoral nerve

B. Genitofemoral nerve

C. Obturator nerve

D. Ilioinguinal nerve

Correct answer: D

The ilioinguinal nerve is the most frequently injured nerve during open inguinal hernia repair. It typically runs on the surface of the spermatic cord, just beneath the external oblique aponeurosis. During the dissection of the inguinal canal to treat an indirect hernia, the nerve can be accidentally entrapped in sutures, crushed by forceps, or severed. Injury leads to numbness or chronic pain (neuralgia) in the inguinal region and the base of the scrotum or labia

majora. The genitofemoral nerve (Option B), specifically its genital branch, is also at risk, but injury is less common than with the ilioinguinal. The femoral nerve (Option A) and obturator nerve (Option C) are located much deeper and more laterally or medially, respectively, and are rarely involved in standard anterior inguinal hernia repairs unless severe complications or deep stitch placement occur. Surgeons often routinely identify and protect the ilioinguinal nerve to prevent postoperative chronic groin pain.

Question 158. A surgical procedure is performed on the great saphenous vein, approximately 2.5 cm anterior to the medial malleolus. Which structure is most likely to be injured during this procedure?

A. Saphenous nerve

B. Sural nerve

C. Deep peroneal nerve

D. Tibial nerve

Correct answer: A

The great saphenous vein (GSV) is consistently located approximately 2.5 cm anterior to the medial malleolus at the ankle. At this level, the saphenous nerve, a branch of the femoral nerve, runs in very close proximity to the vein. Surgical procedures such as venous cut-down or stripping of the GSV carry a high risk of injuring this nerve. Damage typically results in paresthesia or numbness along the medial aspect of the foot and leg. The sural nerve (Option B) runs with the small saphenous vein posterior to the lateral malleolus. The deep peroneal nerve (Option C) is found deep in the anterior compartment of the leg and supplies the first web space of the foot. The tibial nerve (Option D) passes posterior to the medial malleolus within the tarsal tunnel. Because of the intimate anatomical relationship between the GSV and the saphenous nerve at the ankle, it is the most vulnerable structure during distal venous interventions.

Question 159. A patient presents to the outpatient department with a dilated, tortuous vein in the leg. He reports a history of trauma to the same area 10 years ago. On examination, a pulsatile vein is also noted. What is the most likely diagnosis?

A. Varicose vein

B. Angiofibroma

C. Hemangioma

D. A-V Fistula

Correct answer: D

The presentation of a dilated, tortuous vein that is pulsatile following remote trauma is highly

characteristic of an acquired Arteriovenous (A-V) Fistula. Penetrating or blunt trauma can create an abnormal communication between an adjacent artery and vein. Over time, high-pressure arterial blood enters the low-pressure venous system, causing the vein to dilate (venous hypertension) and exhibit palpable pulsations or a "thrill." Standard varicose veins (Option A) are common but are not pulsatile; they result from valvular incompetence rather than arterial shunting. Angiofibromas (Option B) are highly vascular benign tumors, usually found in the nasopharynx of adolescent males, not the leg. Hemangiomas (Option C) are congenital vascular malformations or tumors that typically present in childhood and do not usually develop pulsations later in life due to trauma. Therefore, the combination of a traumatic history and pulsatile venous dilation confirms an A-V fistula as the most probable etiology.

Question 160. An adult man presents to the outpatient department with painful scrotal swelling and fever. The swelling involves the tunica vaginalis and is associated with fluid accumulation. What is the most likely diagnosis?

A. Varicocele

B. Hydrocele

C. Cystocele

D. Torsion testis

Correct answer: B

A hydrocele is defined as an abnormal collection of serous fluid within the layers of the tunica vaginalis surrounding the testis. While often painless, an acute or infected hydrocele (pyocele) can present with pain and fever. The characteristic "fluid accumulation" within the tunica vaginalis is the hallmark of this condition. A varicocele (Option A) involves the dilation of the pampiniform plexus of veins, often described as a "bag of worms," and does not typically involve fluid accumulation in the tunica. A cystocele (Option B) is the herniation of the bladder into the vagina, which is anatomically impossible in this male patient. Torsion of the testis (Option D) is a surgical emergency presenting with sudden, severe pain and a high-riding testis, but it is primarily a vascular compromise rather than a fluid collection in the tunica vaginalis. Given the specific description of fluid within the tunica vaginalis, hydrocele is the most accurate diagnosis.

PEDIATRICS

Question 161. Which of the following conditions is associated with both the "lemon sign" and "spina bifida" on a prenatal ultrasound?

A. Neural Tube Defects (NTD) - Spina Bifida

B. Anencephaly

C. Down Syndrome

D. Brachycephaly

Correct answer: A

The "lemon sign" refers to the inward scalloping of the frontal bones on an axial prenatal ultrasound of the fetal skull, giving it a shape resembling a lemon. This sign is a highly sensitive secondary marker for open Neural Tube Defects (NTDs), specifically spina bifida. It occurs because the spinal defect leads to a drop in cerebrospinal fluid pressure, causing the brain to shift caudally (Arnold-Chiari II malformation) and the skull to deform. Anencephaly (Option B) is an NTD where the skull vault and brain are largely absent, so a lemon sign cannot be seen. Down Syndrome (Option C) is associated with markers like increased nuchal translucency or a "double bubble" sign, not the lemon sign. Brachycephaly (Option D) refers to a broad, short skull shape seen in various syndromes or as a normal variant, but not specifically linked to spinal lesions. Therefore, the lemon sign is a classic sonographic indicator for identifying occult or overt spina bifida.

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(A)

Duodenal atresia: Shows a double bubble sign (only stomach and duodenum), not triple bubble.

(C)

Small bowel obstruction: Typically shows multiple air-fluid levels (step-ladder pattern), not a fixed triple bubble.

(D)

Ileal atresia: Shows a multiple bubble pattern due to distal obstruction, not just three bubbles.

Thus, the presence of a triple bubble sign confirms jejunal atresia.

Question 162. A 7-year-old child with short stature, skin patches, and learning difficulties presents to the outpatient department. Diagnostic workup reveals a defect in DNA repair, specifically affecting double-strand break repair. What is the most likely diagnosis?

A. Fasciocutaneous rotation flap

B. Bilobed flap

C. Transposition flap

D. Random pattern flap

Correct answer: B

The image shows a curved, double-lobed flap closure, which is characteristic of a bilobed flap. This technique is commonly used in pilonidal sinus surgery (e.g., off-midline closure

procedures) to redistribute tension and flatten the natal cleft, reducing recurrence.
A bilobed flap consists of two adjacent flaps that are transposed sequentially to close a defect, allowing:
1.
Tension-free closure
2.
Better cosmetic outcome
3.
Reduced risk of recurrence in pilonidal disease
Why other options are incorrect:
(A)
Fasciocutaneous rotation flap: Involves a broad arc rotation, not the characteristic double-lobed design
(C)
Transposition flap: Single flap moved across defect; does not show the two-lobed pattern
(D)
Random pattern flap: Refers to blood supply type, not a specific flap design
The distinct double-lobed appearance confirms this as a bilobed flap, commonly used in pilonidal sinus surgery.

Question 163. For how long is exclusive breastfeeding recommended?

A. 3 months
B. 6 months
C. 9 months
D. 12 months

Correct answer: B

According to the World Health Organization (WHO) and the Ministry of Health and Family Welfare (India), exclusive breastfeeding is recommended for the first 6 months of an infant's life. "Exclusive" means that the infant receives only breast milk; no other liquids or solids are given, not even water, with the exception of oral rehydration solutions, drops, or syrups of vitamins, minerals, or medicines. Breast milk provides all the nutrients, antibodies, and fluids a healthy infant needs during this critical growth period. Option A (3 months) is insufficient for optimal development and immune protection. Options C and D (9 and 12 months) are incorrect as a primary goal; while breastfeeding should continue alongside complementary foods up to 2 years or beyond, "exclusive" breastfeeding must end at 6 months to introduce essential nutrients like iron that breast milk alone can no longer adequately provide. This practice significantly reduces infant mortality from common childhood illnesses like diarrhea and

pneumonia.

Question 164. A 7-year-old boy is brought to the pediatric clinic with multiple soft, pedunculated masses scattered over his torso and limbs. His parents report recent learning and reading difficulties. Examination reveals hyperpigmented macules with irregular borders on his back, and ocular findings as shown. What is the most likely diagnosis in this child?

A. NF2

B. TSC1

C. TSC2

D. NF1

Correct answer: D

The child presents with classic features of Neurofibromatosis Type 1 (NF1), an autosomal dominant neurocutaneous syndrome. The "pedunculated masses" are neurofibromas, and the "hyperpigmented macules with irregular borders" are café-au-lait spots. Learning disabilities are also common in NF1 patients. The ocular image shows Lisch nodules, which are pigmented hamartomas of the iris pathognomonic for NF1. NF2 (Option A) is characterized by bilateral vestibular schwannomas and typically lacks Lisch nodules and extensive café-au-lait spots. Tuberous Sclerosis Complex (TSC1 and TSC2, Options B and C) presents with ash-leaf spots, shagreen patches, and facial angiofibromas, but not neurofibromas or Lisch nodules. The diagnosis of NF1 is clinical, requiring at least two of the seven NIH diagnostic criteria. Given the cutaneous and ocular findings, NF1 is the definitive diagnosis.

Question 165. What is the daily fluid requirement for a 3-day-old baby with a birth weight of ?

A. 100-110 ml/kg/day

B. 80-90 ml/kg/day

C. 120-130 ml/kg/day

D. 130-150 ml/kg/day

Correct answer: B

Fluid requirements in neonates depend on postnatal age, birth weight, and renal maturity. In the first few days of life, especially in low-birth-weight (LBW) infants, fluids are introduced cautiously to allow for physiological weight loss and to prevent complications related to fluid overload.

For an LBW baby (≈ 1.5–2 kg):

Day 1: ~60–70 ml/kg/day

Day 2: ~70–80 ml/kg/day

Day 3: 80–90 ml/kg/day

Day 4–5: ~100–110 ml/kg/day

After Day 7: ~120–150 ml/kg/day (full maintenance)

Thus, on Day 3 of life, the recommended daily fluid requirement is 80–90 ml/kg/day.

Why other options are incorrect:

1.

Option A (100–110 ml/kg/day): Appropriate for Day 4–5, not Day 3

2.

Options C & D (120–150 ml/kg/day): Used after the first week, once full maintenance is established

Excessive fluids early in LBW neonates increase the risk of PDA, NEC, BPD, and electrolyte imbalance. Therefore, a gradual, step-wise increase in fluids is the standard neonatal practice.

Question 166. At what age is a child typically able to ride a tricycle, walk up stairs using alternate steps, but cannot hop?

A. 2.5 years

B. 3.5 years

C. 4.5 years

D. 5.5 years

Correct answer: B

Gross motor milestones are predictable markers of a child's development. A child who can ride a tricycle and walk up stairs with alternate steps has typically reached the developmental level of a 3-year-old. Hopping on one foot is a more advanced balance skill that is usually mastered by age 4. Therefore, a child who has mastered the 3-year milestones but cannot yet hop is most likely around 3.5 years old. Option A (2.5 years) is too young, as they would still be walking up stairs "two feet per step" and likely cannot pedal a tricycle. Options C and D (4.5 and 5.5 years) are too old, as these children should already be able to hop and even skip (by age 5). Understanding these age-specific gross motor skills helps pediatricians identify developmental delays. In summary, the ability to alternate feet on stairs and pedal a trike, but failing to hop, specifically brackets the child's developmental age.

Question 167. A 1-month-old infant presents with immediate crying after breastfeeding, along with diarrhea and vomiting. What is the most likely diagnosis?

A. Lactose Intolerance

B. Duodenal Atresia

C. Galactosemia

D. Pyloric Stenosis

Correct answer: A

The infant presents with immediate crying after breast feeding, along with diarrhea and vomiting, which suggests a problem related to milk digestion. Lactose intolerance occurs due to deficiency of lactase, the enzyme required to break down lactose into glucose and galactose.

Pathophysiology : Undigested lactose remains in the intestine, leading to:

1.

Osmotic diarrhea (draws water into lumen)

2.

Gas production by bacterial fermentation → bloating, discomfort, crying

3.

Symptoms appear immediately after feeding

Why other options are incorrect:

(B)

Duodenal atresia: Presents with bilious vomiting soon after birth, not feeding-related crying and diarrhea

(C)

Galactosemia: Causes feeding intolerance with jaundice, hepatomegaly, not immediate crying after feeds

(D)

Pyloric stenosis: Presents with projectile non-bilious vomiting, usually without diarrhea

Immediate symptoms after milk intake with diarrhea strongly indicate lactose intolerance.

Question 168. A newborn presents with weak lower limb pulses and strong upper limb pulses. What is the most likely diagnosis?

A. TGA

B. COA

C. TOF

D. Ebstein anomaly

Correct answer: B

Coarctation of the Aorta (COA) is a congenital heart defect characterized by a narrowing of the aortic arch, most commonly just distal to the origin of the left subclavian artery. This leads to high blood pressure and strong pulses in the upper extremities, contrasted with significantly lower pressure and weak or delayed pulses in the lower extremities (femoral pulses). Transposition of the Great Arteries (TGA, Option A) presents with profound cyanosis in the newborn but uniform pulses. Tetralogy of Fallot (TOF, Option C) is a cyanotic heart disease presenting with "tet spells" but typically does not cause differential pulses. Ebstein anomaly

(Option D) involves a malformed tricuspid valve leading to right-sided heart failure and cyanosis, but not a pulse differential between upper and lower limbs. Clinical diagnosis of COA is made by simultaneous palpation of the radial and femoral pulses (brachio-femoral delay) and is confirmed with echocardiography or CT angiography.

ORTHOPEDICS

Question 169. A 17-year-old boy presents with a painless lump on the lateral aspect of his left knee. A radiograph is provided. What is the most likely diagnosis?

A. Enchondroma

B. Osteosarcoma

C. Osteomyelitis

D. Osteochondroma

Correct answer: D

Osteochondroma, also known as exostosis, is the most common benign bone tumor in children and adolescents. It typically presents as a painless, slow-growing lump near the growth plate of long bones, especially around the knee (distal femur or proximal tibia). The radiograph classically shows a bony outgrowth with a cortex and medulla continuous with those of the host bone, often described as "pedunculated" or "sessile." Enchondroma (Option A) is a benign cartilage tumor that grows within the medullary cavity, usually in the small bones of the hands. Osteosarcoma (Option B) is a highly malignant tumor presenting with deep-seated pain, night pain, and characteristic "sunburst" or "Codman's triangle" radiological features. Osteomyelitis (Option C) is an infection of the bone presenting with acute pain, fever, and local inflammatory signs. Given the adolescent age, painless clinical presentation, and pathognomonic radiological appearance of a bony outgrowth, osteochondroma is the definitive diagnosis.

Question 170. Which of the following factors is not considered in the FRAX score assessment?

A. Height

B. Smoking

C. Body mass index

D. Glucocorticoid intake

Correct answer: A

The FRAX (Fracture Risk Assessment Tool) score is used to calculate the 10-year probability of a major osteoporotic fracture based on individual clinical risk factors. While Body Mass Index (BMI) (Option C) is a core component, it is calculated using weight and height; however, absolute height (Option A) is not a standalone factor in the risk calculation. Smoking status (Option B) and current or past glucocorticoid intake (Option D) are well-established clinical risk

factors included in the tool. Other factors considered include age, sex, prior fracture history, rheumatoid arthritis, secondary osteoporosis, and alcohol intake. The tool is designed to identify patients who may benefit from pharmacological intervention to prevent fractures. While height is measured to calculate BMI, it does not serve as an independent predictor of bone mineral density or fracture risk within the FRAX algorithm. Therefore, "height" is the correct choice as the factor not directly assessed as an independent risk variable.

Question 171. A patient falls onto an outstretched hand, and an X-ray shows a fracture of the first metacarpophalangeal (MCP) joint with associated subluxation. How is this type of fracture classified?

A. Bennett's fracture

B. Scaphoid fracture

C. Reverse Colle's fracture

D. Colle's fracture

Correct answer: A

The X-ray and clinical description define a Bennett's fracture, which is an intra-articular fracture at the base of the first metacarpal. It typically occurs due to axial loading on a partially flexed thumb, such as from a fall on an outstretched hand. The fracture involves a small fragment of the metacarpal base remaining attached to the volar oblique ligament, while the main metacarpal shaft is subluxed proximally and dorsally by the pull of the abductor pollicis longus (APL) muscle. Scaphoid fractures (Option B) involve the carpal bones and are noted for pain in the anatomical snuffbox. Colle's fracture (Option D) is a distal radius fracture with dorsal displacement ("dinner fork" deformity), while Reverse Colle's (Smith's fracture, Option C) involves volar displacement of the distal radius. Because this fracture specifically involves the base of the thumb's metacarpal with subluxation, it is identified as a Bennett's fracture.

Question 172. A patient involved in a road traffic accident sustains fractures of both the tibia and fibula. What type of fracture is this classified as?

A. Bumper Fracture

B. Patella sleeve fracture

C. Depressed skull fracture

D. Cervical fracture

Correct answer: A

A "Bumper Fracture" is a clinical term for a fracture of the proximal tibia and/or fibula, typically caused by a direct blow from a car bumper to a pedestrian's leg. These are often high-energy injuries resulting in comminuted or displaced fractures of both bones at the level of the impact. Patella sleeve fractures (Option B) are specific to the pediatric population and involve an avulsion of the patellar cartilage with a small bone fragment. Depressed skull fractures (Option C) and cervical fractures (Option D) involve the cranium and spine, respectively, and are not descriptive of the leg injuries mentioned. Bumper fractures are significant because they are often associated with soft tissue damage, compartment syndrome, and injuries to the peroneal nerve or popliteal artery. Diagnosis is confirmed with X-rays showing the fracture site. Management depends on the degree of displacement and stability, often requiring surgical fixation.

Question 173. Codman's triangle is seen in which of the following conditions?

A. Osteomyelitis

B. Aneurysmal bone cyst

C. Osteogenic sarcoma

D. Chondrosarcoma

Correct answer: C

Codman's triangle is a pathognomonic radiological sign of an aggressive or malignant bone lesion. It appears when a rapidly growing tumor lifts the periosteum away from the bone cortex, leaving a triangular area of new subperiosteal bone at the margin of the lesion. This is most classically seen in Osteogenic sarcoma (Osteosarcoma), the most common primary malignant bone tumor in children. While it can occasionally be seen in aggressive osteomyelitis (Option A), the "sunburst" appearance and Codman's triangle are hallmarks of osteosarcoma. Aneurysmal bone cysts (Option B) typically show a "soap-bubble" appearance with an intact, though thinned, cortex. Chondrosarcomas (Option D) are cartilage-forming malignant tumors that may show "popcorn" calcifications rather than the specific periosteal reaction of Codman's triangle. Recognizing this sign is critical as it indicates a highly invasive process requiring urgent biopsy and staging to determine the appropriate oncological management.

Question 174. A 17-year-old boy falls on an outstretched hand and now has pain and swelling at the base of the thumb. Which bone is most likely fractured?

A. Bloom Syndrome

B. Xeroderma Pigmentosum

C. Cockayne Syndrome

D. Lynch Syndrome

Correct answer: A

Bloom Syndrome is a rare autosomal recessive disorder characterized by short stature, learning difficulties, and a sun-sensitive "butterfly" rash on the face (skin patches). It is caused by a mutation in the BLM gene, which encodes a DNA helicase essential for maintaining genomic stability during DNA replication and repair. While the primary defect is in DNA helicase, it manifests as a significant increase in sister chromatid exchanges and defects in repairing various DNA lesions, including double-strand breaks. Xeroderma Pigmentosum (Option B) is a defect in nucleotide excision repair, primarily causing severe photosensitivity and early skin cancers. Cockayne Syndrome (Option C) involves defective transcription-coupled DNA repair, presenting with "progeroid" (premature aging) features and microcephaly. Lynch Syndrome (Option D) is a defect in mismatch repair, primarily predisposing adults to colorectal and endometrial cancers. The combination of short stature, cognitive delay, and DNA instability specific to Bloom Syndrome makes it the most likely diagnosis.

Question 175. During delivery, the head is delivered, but the shoulders become stuck. What is the most likely diagnosis?

A. Cephalopelvic Disproportion (CPD)

B. Occipito-posterior Position

C. Shoulder Dystocia

D. Breech Presentation

Correct answer: C

Shoulder dystocia is an obstetric emergency occurring when the fetal head has delivered but the anterior shoulder becomes wedged behind the mother's pubic symphysis. This is often recognized by the "turtle sign," where the head retracts against the perineum. Cephalopelvic Disproportion (CPD) (Option A) refers to a mismatch between fetal size and the pelvic canal, leading to failure of the head to engage or descend, rather than entrapment after head delivery. Occipito-posterior position (Option B) involves a malpresentation of the head that can slow labor but does not inherently cause the shoulders to stick. Breech presentation (Option D) occurs when the buttocks or feet are the presenting part, which is the opposite of the described cephalic delivery. Shoulder dystocia requires immediate maneuvers such as McRoberts maneuver (hyperflexion of maternal thighs) and suprapubic pressure to dislodge the shoulder. This is a high-risk scenario for brachial plexus injury or neonatal hypoxia.

Examination Paper June 2024 Question

(C) Ovarian tumor

(D) Hypothyroidism

AAns

(A) Polycystic Ovary Syndrome (PCOS)

The clinical presentation of irregular periods (ovulatory dysfunction), acne, and excessive hair growth (hirsutism), combined with laboratory findings of elevated testosterone and insulin, is pathognomonic for Polycystic Ovary Syndrome (PCOS). PCOS is a complex endocrine disorder characterized by hyperandrogenism and insulin resistance. Endometriosis (Option B) typically presents with severe pelvic pain and infertility but not hyperandrogenic features. While certain virilizing ovarian tumors (Option C) can cause high testosterone, they usually present with rapid onset of symptoms rather than a chronic history. Hypothyroidism (Option D) can cause menstrual irregularities but is not associated with hirsutism or acne. Management of PCOS involves lifestyle modifications to address insulin resistance, along with hormonal contraceptives or anti-androgens to manage the skin and cycle issues. It is the most common cause of anovulatory infertility in reproductive-age women.

Question 176. According to the Indian health care guidelines, what is the recommended number of antenatal visits during pregnancy?

A. 13 visits

B. 6 visits

C. 8 visits

D. 4 visits

Correct answer: A

Traditionally, the ideal antenatal care (ANC) schedule in India is based on frequent monitoring throughout pregnancy rather than just the minimum required visits.

According to this ideal schedule:

1.

Up to 7 months: one visit every month

2.

8th month: one visit every 2 weeks

3.

9th month: one visit every week

This adds up to approximately 13–14 visits, which is considered the recommended or ideal number of ANC visits for optimal maternal and fetal care.

Important distinction:

1.

Minimum visits (Government of India): 4 visits

2.

WHO recommendation (2016): at least 8 contacts

3.

Ideal Indian schedule:13 visits

Why other options are incorrect:

(B)

6 visits: Not a recognized standard

(C)

8 visits: WHO guideline, but not the “ideal” Indian schedule asked here

(D)

4 visits: Minimum requirement only

Thus, in exam context, 13 visits represent the recommended ANC schedule.

Question 177. What is the ideal time for umbilical cord clamping after birth?

A. Immediately after birth

B. Within 30 seconds of birth

C. Between 1-3 minutes after birth

D. More than 3 minutes after birth.

Correct answer: C

Current global and Indian clinical guidelines recommend delayed cord clamping (DCC), performed between 1 and 3 minutes after the birth of the baby. DCC allows for the transfer of approximately of placental blood to the newborn, which significantly increases neonatal iron stores and hemoglobin levels, reducing the risk of anemia later in infancy. Immediate clamping (Option A) or clamping within 30 seconds (Option B) is now reserved for specific emergencies where immediate maternal or neonatal resuscitation is required. Clamping more than 3 minutes after birth (Option D) does not provide significant additional benefit and may complicate the timing of active management of the third stage of labor. In preterm infants, DCC is particularly beneficial as it reduces the need for blood transfusions and decreases the incidence of intraventricular hemorrhage. Therefore, the "ideal" window for physiological benefit is the 1–3 minute mark.

Question 178. A 32-year-old pregnant woman presents to the emergency department with blood pressure of 220/120 mmHg, along with headache, seizure, and blurred vision. Which intravenous antihypertensive is preferred for managing hypertension in pregnancy?

A. IV Labetalol

B. IV nitroglycerine

C. IV hydralazine

D. IV sodium nitroprusside

Correct answer: A

This pregnant patient presents with severe hypertension (220/120 mm Hg) accompanied by headache, seizures, and visual disturbances, which is diagnostic of eclampsia with hypertensive emergency. Immediate blood pressure control is essential to prevent catastrophic complications such as intracerebral hemorrhage, placental abruption, and maternal death.

IV labetalol is the preferred first-line intravenous antihypertensive for acute management of severe hypertension in pregnancy. It has a rapid onset, effectively lowers blood pressure, and has a good safety profile for both mother and fetus due to its combined α- and β-adrenergic blocking action.

Why the other options are less suitable:

IV

hydralazine (Option C): An accepted alternative, but it is associated with more maternal side effects such as tachycardia, headache, and flushing, and less predictable BP control.

IV

nitroglycerine (Option B): Mainly used for acute pulmonary edema or refractory cases, not first-line for eclampsia.

IV

sodium nitroprusside (Option D): Avoided in pregnancy due to the risk of fetal cyanide and thiocyanate toxicity, especially with prolonged use.

Important note: While BP control is crucial, magnesium sulfate is the drug of choice for seizure control and prevention in eclampsia. Both therapies must be instituted promptly as part of comprehensive management.

Question 179. A female patient presents to the outpatient department 10 days postpartum with a tender, fluctuant breast mass, high-grade fever, and cracked nipples. What is the most likely diagnosis?

A. Breast engorgement

B. Breast abscess

C. Acute mastitis

D. Fibroadenoma

Correct answer: B

The presence of a fluctuant mass in the breast, associated with fever and severe tenderness, is the classic clinical definition of a breast abscess. This typically occurs as a complication of untreated or inadequately treated acute mastitis (Option C). Mastitis itself involves inflammation, redness, and fever, but it does not yet have a localized collection of pus (fluctuance). Breast engorgement (Option A) occurs early in the postpartum period (Days 2–4)

and involves bilateral, generalized swelling and discomfort, but not localized fluctuant masses or high-grade fever. Fibroadenoma (Option D) is a benign, painless, "mouse-in-the-breast" lump seen in younger women, unrelated to lactation or infection. The most common causative organism is Staphylococcus aureus, often entering through cracked nipples. Management of an abscess involves incision and drainage or needle aspiration, along with appropriate antibiotics and continued breast feeding or pumping from the affected side.

Question 180. Which of the following is the drug of choice (DOC) for treating morning sickness in pregnant women?

A. Pyridoxine (Vitamin B6)

B. Domperidone

C. Ondansetron

D. Metoclopramide

Correct answer: A

Pyridoxine (Vitamin B6) is the first-line pharmacological treatment for mild to moderate nausea and vomiting of pregnancy (morning sickness). It is often used alone or in a fixed-dose combination with the antihistamine doxylamine. This combination is the only FDA-approved medication specifically for this indication and has an excellent safety profile. Domperidone (Option B) and Metoclopramide (Option D) are prokinetic agents used as second-line therapy for more severe or refractory cases. Ondansetron (Option C), a serotonin antagonist, is highly effective for severe nausea but is generally reserved for patients who have failed first-line therapies, partly due to controversial data regarding a slight increase in the risk of oral clefts if used in the first trimester. Therefore, for initial drug therapy in uncomplicated morning sickness, Pyridoxine remains the gold standard.

Question 181. What are the contraindications for the use of ventouse (vacuum extraction) during delivery?

A. Decreased bear down efforts

B. Heart disease

C. Preterm

D. Dilatation

Correct answer: C

Vacuum extraction (ventouse) is contraindicated in preterm infants, generally defined as less than 34 weeks of gestation. This is because the preterm fetal head is soft and the scalp is more fragile, significantly increasing the risk of intracranial hemorrhage and subgaleal hematoma from the suction pressure. Heart disease (Option B) and decreased bear-down efforts (Option A) are actually indications for instrumental delivery (forceps or vacuum) to shorten the second stage of labor and reduce maternal effort. Dilatation (Option D) is not a contraindication;

however, for any instrumental delivery, the cervix must be fully dilated . If the cervix is not fully dilated, an instrumental attempt is contraindicated. Other contraindications for ventouse include fetal face presentation and suspected fetal bleeding disorders. Consequently, prematurity stands out as a major relative contraindication due to fetal vulnerability.

Question 182. Which of the following is the correct definition of postpartum pyrexia?

A. After 24 hours, temperature > 100.4 degrees Fahrenheit

B. After 6 hours, temperature > 100.4 degrees Fahrenheit

C. After 3 hours, temperature > 100.4 degrees Fahrenheit

D. After 12 hours, temperature > 100.4 degrees Fahrenheit

Correct answer: A

Postpartum pyrexia, or puerperal pyrexia, is traditionally defined as a temperature rise to ≥ 100.4°F (38°C) or higher, occurring on any two of the first ten days following delivery, excluding the initial 24 hours. The first 24 hours are typically excluded because a mild temperature elevation during this period is often due to dehydration or the physiological stress of labor. Option B, C, and D are incorrect because they specify timeframes within the first 24 hours, which do not meet the standard diagnostic criteria for morbid pyrexia. The most common cause of pyrexia during the puerperium is genital tract infection (puerperal sepsis), but clinicians must also consider urinary tract infections, mastitis, and deep vein thrombosis. Accurate diagnosis requires a thorough physical examination and relevant cultures. Prompt treatment with broad-spectrum antibiotics is vital to prevent severe maternal morbidity or mortality associated with sepsis.

Question 183. What are the potential effects of folic acid deficiency during pregnancy?

A. Neural tube defects

B. Preterm labour

C. Pernicious anemia

D. Iron deficiency anemia

Correct answer: A

Folic acid is a crucial B-vitamin required for DNA synthesis and rapid cell division during fetal development. A deficiency in maternal folic acid is strongly linked to the development of neural tube defects (NTDs), such as spina bifida and anencephaly, which occur when the neural tube fails to close properly within the first 28 days of gestation. While severe deficiency might

contribute to general pregnancy complications, Option B (preterm labor) is not the primary direct outcome of folate lack. Pernicious anemia (Option C) is specifically caused by Vitamin B12 deficiency due to a lack of intrinsic factor, not folic acid. Iron deficiency anemia (Option D) results from inadequate iron levels and is a separate nutritional pathology. Due to its critical role, universal periconceptional folic acid supplementation is recommended for all women planning pregnancy to significantly reduce the risk of NTDs.

Question 184. A 28-year-old woman, G1P1, presents with intermenstrual bleeding for the past 1.5 months. What is the initial investigation of choice?

A. Ultrasound of the abdomen

B. Transvaginal ultrasound (TVS)

C. Urine pregnancy test

D. Endometrial biopsy

Correct answer: C

In any woman of reproductive age presenting with abnormal uterine bleeding, including intermenstrual bleeding, the absolute first step in management is to rule out pregnancy. A urine pregnancy test (UPT) is a rapid, cost-effective, and highly sensitive initial investigation that guides all subsequent diagnostic paths. Bleeding in a 28-year-old could be related to pregnancy complications such as a threatened abortion or ectopic pregnancy. Transvaginal ultrasound (Option B) is an excellent follow-up tool to visualize pelvic pathology like fibroids or polyps but is secondary to confirming pregnancy status. Abdominal ultrasound (Option A) is less sensitive for early gynecological issues than TVS. Endometrial biopsy (Option D) is generally reserved for women over 45 or those with significant risk factors for malignancy, which this patient lacks. Therefore, ruling out gestation remains the standard of care for the initial workup of abnormal bleeding.

Question 185. A woman with a history of lower segment cesarean section (LSCS) presents with her fetus in the occiput posterior (OP) position. What is the most appropriate management strategy in this case?

A. Attempt normal vaginal delivery

B. Perform a cesarean section

C. Perform an external cephalic version

D. Use vacuum-assisted delivery

Correct answer: A

A woman with a previous lower segment cesarean section (LSCS) can be offered a trial of labor after cesarean (TOLAC) if there are no contraindications. The presence of a fetus in the occiput

posterior (OP) position is not an absolute indication for cesarean section. OP position is relatively common during labor, and in many cases, the fetal head rotates spontaneously to occiput anterior, allowing successful vaginal delivery.

Although OP position may be associated with prolonged labor, back pain, and increased need for assistance, it does not preclude a trial of vaginal birth. Continuous fetal monitoring and careful observation for scar integrity are essential due to the history of LSCS.

Why other options are incorrect:

(B)

Cesarean section: Reserved for complications like fetal distress, failed labor, or scar dehiscence, not just OP position.

(C)

External cephalic version: Used for breech presentation, not for OP position.

(D)

Vacuum-assisted delivery: Considered only in the second stage of labor if descent is inadequate, not as an initial approach.

Thus, trial of normal vaginal delivery is the most appropriate management.

Question 186. The image illustrates which vitamin deficiency?

A. Vitamin A Deficiency

B. Vitamin E Deficiency

C. Vitamin C Deficiency

D. Niacin

(Vitamin

B3)

Deficiency

Correct answer: D

The image demonstrates Casal's necklace, a pathognomonic dermatological sign of Pellagra, which is caused by a deficiency of Niacin (Vitamin B3) or its precursor tryptophan. Pellagra is classically characterized by the "3 Ds": Dermatitis, Diarrhea, and Dementia. The dermatitis is photosensitive and symmetrically distributed on sun-exposed areas, resulting in a well-demarcated area of hyperpigmentation and hyperkeratosis around the neck. Vitamin A deficiency (Option A) causes xerophthalmia and follicular hyperkeratosis (phrynoderma). Vitamin C deficiency (Option C) results in scurvy, characterized by petechiae and bleeding gums. Vitamin E deficiency (Option B) is rare and primarily causes neurological issues like ataxia. Pellagra is often seen in populations where corn (maize) is the primary dietary staple, as corn is deficient in both niacin and tryptophan. Treatment involves oral nicotinamide supplementation and a balanced diet.

Question 187. A 26-year-old nulligravida presents with third-

degree uterine prolapse but has no cystocele or rectocele. What is the most appropriate management for her condition?

A. LeFort colpocleisis

B. Fothergill operation (Manchester procedure)

C. Shirodkar vaginal approach

D. Abdominal sling surgery

Correct answer: D

For a young, nulligravida woman with significant uterine prolapse, the primary goal of management is to preserve the uterus and future fertility. Abdominal sling surgery (such as Shirodkar's or Purandare's abdominal cervicopexy) is the most appropriate choice. This procedure uses a synthetic or fascial sling to anchor the cervix to the anterior abdominal wall or sacrum, providing durable support without compromising the vaginal canal or uterine function. LeFort colpocleisis (Option A) involves closing the vagina and is reserved for elderly, sexually inactive women. The Fothergill operation (Option B) involves cervical amputation, which can cause infertility and cervical incompetence, making it less ideal for a nulligravida. While Shirodkar described a vaginal approach for cervical incompetence, the "abdominal sling" specifically refers to the corrective procedure for nulligravida prolapse. This approach addresses the underlying ligamentous laxity while maintaining the potential for childbearing.

Question 188. Upto how many hours postpartum can an intrauterine device (IUD) be safely inserted?

A. 24 hours

B. 48 hours

C. 6 weeks

D. 12 weeks

Correct answer: B

This question reinforces the standard protocol for Postpartum Intrauterine Contraceptive Device (PPIUCD) insertion. An IUD can be safely and effectively inserted within the first 48 hours following delivery. Insertion during this window is highly convenient for the patient as it occurs prior to hospital discharge and does not require a return visit. After 48 hours, the risk of infection and device expulsion increases as the uterus rapidly involutes. If this immediate window is missed, the next safe period for insertion is after the postpartum recovery period, typically at 6 weeks (Option C). Option A (24 hours) is within the safe window but is not the upper limit. Option D (12 weeks) is a possible time frame but is not the specific "postpartum"

insertion threshold. Clinical studies have shown that PPIUCD is a safe, long-acting reversible contraceptive method with high levels of patient acceptability and minimal impact on lactation.

Question 189. Where is the Bartholin gland located?

A. Anterior 1/3rd of labia majora

B. Posterior 1/3rd of labia majora

C. Lateral 1/3rd of labia majora

D. Medial 1/3rd of labia majora

Correct answer: B

The Bartholin glands (greater vestibular glands) are a pair of pea-sized glands located in the posterior third of the labia majora, deep within the perineum. Their primary function is to secrete mucus into the vaginal vestibule to provide lubrication during sexual arousal. The ducts of these glands open at the 4 o'clock and 8 o'clock positions relative to the vaginal introitus. Options A, C, and D are anatomically incorrect locations for these specific glands. Clinically, these glands are important because they can become obstructed, leading to the formation of a Bartholin cyst or, if infected, a painful Bartholin abscess. An abscess usually requires surgical management, such as incision and drainage or marsupialization, to prevent recurrence. Precise knowledge of pelvic anatomy is essential for both the diagnosis of vulvar masses and the performance of minor gynecological surgical procedures in this area.

Question 190. Which of the following is the best post-coital contraceptive method?

A. Levonorgestrel (LNG)

B. Estrogen

C. Norethisterone

D. Ulipristal acetate

Correct answer: A

Levonorgestrel (LNG) is considered the drug of choice (DOC) for post-coital (emergency) contraception. It is widely used, easily available (e.g., i-pill), and has a good safety profile with minimal side effects. It works mainly by inhibiting or delaying ovulation.

Key points:

1.

Effective if taken within 72 hours of unprotected intercourse

2.

Can be given as a single 1.5 mg dose or two divided doses

3.

Does not interfere significantly with the normal menstrual cycle

Why other options are incorrect:

(B)

Estrogen: Used in older regimens; associated with more side effects (nausea, vomiting, thrombosis)

(C)

Norethisterone: Not used for emergency contraception; mainly for menstrual disorders

(D)

Ulipristal acetate: More effective pharmacologically, but LNG is the preferred DOC in Indian guidelines and exams

Thus, as per exam standards, the best answer is Levonorgestrel.

DERMATOLOGY

Question 191. A female patient presents to the outpatient department with recurrent, fever-associated lesions on the lips, as shown below. What is the characteristic feature observed on a Tzanck smear in this condition?

A. Handerson patterson bodies

B. Multinucleated giant cells

C. Owl eye appearance

D. Acantholytic cells

Correct answer: B

The image depicts recurrent vesicular lesions on the lip, characteristic of Herpes Simplex Virus (HSV-1) infection. A Tzanck smear, performed by scraping the base of a freshly opened vesicle, is a rapid bedside diagnostic test. The pathognomonic finding for herpetic infections (HSV or VZV) in a Tzanck smear is the presence of multinucleated giant cells with "molded" nuclei. Henderson-Patterson bodies (Option A) are intracytoplasmic inclusions seen in Molluscum contagiosum. Owl-eye appearance (Option C) refers to the intranuclear inclusions of Cytomegalovirus (CMV). Acantholytic cells (Option D), or Tzanck cells, are seen in Pemphigus vulgaris but are not multinucleated giant cells. While Tzanck smears cannot differentiate between HSV and VZV, the clinical location on the lip strongly favors HSV-1. These findings allow for the prompt initiation of antiviral therapy such as acyclovir to reduce the duration and severity of the outbreak.

Question 192. 272. (A)Melasma

The image illustrates Melasma, a common acquired hyperpigmentation disorder characterized by symmetrical, patchy, brownish macules on sun-exposed areas of the face, such

as the cheeks, forehead, and upper lip. It is most prevalent in women and is strongly associated with chronic UV exposure, hormonal changes (e.g., pregnancy or oral contraceptives), and genetic predisposition. Freckles (Option B) are much smaller, discrete tan spots that darken with sun exposure. Melanoma (Option C) is a malignant pigment-cell tumor that typically presents as an asymmetric, irregular mole rather than a broad, symmetrical patch. Basal cell carcinoma (Option D) usually presents as a slow-growing, pearly nodule with telangiectasia.
Management of melasma involves strict sun protection, the use of broad-spectrum sunscreens, and topical lightening agents like hydroquinone, tretinoin, and corticosteroids (Kligman's formula). It is often a chronic condition that requires long-term maintenance to prevent recurrence.

A truck driver presents with multiple painful genital ulcers on the scrotum following unprotected sexual intercourse, along with tender lymphadenopathy. What is the most likely cause?

A. Chancre

B. Chancroid

C. Donovanosis

D. Herpes

Correct answer: B

No explanation is available for this recall question yet.

Question 193. A young boy presents to the outpatient department with severe nighttime itching. On examination, burrows are seen in the intertriginous areas, axillae, umbilicus, and between the fingers. Which organism is

responsible for transmitting this condition?

A. Louse

B. Tick

C. Mite

D. Flea

Correct answer: C

The clinical triad of nocturnal pruritus (severe itching at night), specific distribution (web spaces of fingers, axillae, and umbilicus), and the presence of burrows is diagnostic for Scabies. Scabies is a contagious skin infestation caused by the Sarcoptes scabiei mite. The female mite tunnels into the stratum corneum to lay eggs, creating the characteristic linear or S-shaped burrows. Lice (Option A) transmit pediculosis and certain fevers. Ticks (Option B) and fleas (Option D) are vectors for diseases like Lyme disease or plague but do not cause this specific burrowing skin infestation. Scabies is transmitted through direct, prolonged skin-to-skin contact. Management requires the application of a topical scabicide, such as 5% permethrin cream, to the entire body from the neck down. Crucially, all household members and close contacts must be treated simultaneously, regardless of symptoms, to prevent reinfection.

ANAESTHESIA

Question 194. Which of the following topical local anesthetics is commonly used in cataract surgery?

A. Proparacaine 0.5%

B. Bupivacaine 0.5%

C. Halothane

D. Nitrous Oxide

Correct answer: A

In modern ophthalmic practice, particularly for small-incision cataract surgery, topical anesthesia is frequently used. Proparacaine 0.5% is the most common topical local anesthetic applied to the corneal surface. It provides rapid, effective surface anesthesia with a fast onset (within 30 seconds) and minimal corneal irritation. Bupivacaine 0.5% (Option B) is a long-acting anesthetic typically used for regional nerve blocks (like retrobulbar or peribulbar blocks) but is not the standard agent for purely topical application. Halothane (Option C) and Nitrous Oxide (Option D) are inhalation anesthetics used for general anesthesia, not for topical numbing. Topical anesthesia is preferred for its safety, immediate visual recovery, and avoidance of the risks associated with needle-based blocks, such as globe perforation or retrobulbar hemorrhage. It is often supplemented with intracameral lidocaine to ensure patient comfort during manipulation of the lens and iris.

Question 195. Which of the following drugs is used for the reversal of anesthesia?

A. Neostigmine

B. Atropine

C. Glycopyrrolate

D. Midazolam

Correct answer: A

Neostigmine is the standard drug used for the reversal of non-depolarizing neuromuscular blockade at the end of surgery. It is an acetylcholinesterase inhibitor that increases the concentration of acetylcholine at the neuromuscular junction, thereby outcompeting the muscle relaxant. Because neostigmine also causes systemic muscarinic side effects like bradycardia and salivation, it is almost always administered with an anticholinergic agent like glycopyrrolate (Option C) or atropine (Option B) to block these unwanted effects. However, the primary "reversal agent" for the paralysis itself is neostigmine. Midazolam (Option D) is a benzodiazepine used for sedation and amnesia, not for reversal. The timing of neostigmine administration is critical and should only occur once the patient has shown some evidence of spontaneous recovery of muscle strength. Successful reversal is confirmed by clinical markers like the ability to lift the head for 5 seconds or a sustained grip.

Question 196. Which of the following comes under ASA grade 1?

A. Healthy patient

B. Mild disease

C. Moderate disease

D. Morbid patient

Correct answer: A

The ASA (American Society of Anesthesiologists) physical status classification is used to assess a patient’s preoperative physical condition and predict perioperative risk. ASA Grade 1 refers to a completely healthy patient with no systemic disease and no functional limitations. Such individuals are physically fit, have no underlying medical conditions, and are considered to have the lowest anesthetic risk. Examples include a young adult undergoing elective surgery like hernia repair or a child scheduled for tonsillectomy without any comorbidities.

Why other options are incorrect:

(B)

Mild disease: This corresponds to ASA Grade 2, which includes patients with mild systemic illness such as controlled hypertension or diabetes without complications.

(C)

Moderate disease: This falls under ASA Grade 3, where there is significant systemic disease causing functional limitation, such as poorly controlled hypertension or stable angina.

(D)

Morbid patient: This corresponds to ASA Grade 4 or 5, indicating severe systemic disease that is life-threatening or a moribund state.
Thus, ASA Grade 1 clearly represents a healthy patient.

Question 197. Which of the following intravenous anesthetics functions as an NMDA receptor antagonist?

A. Ketamine
B. Propofol
C. Thiopentone sodium
D. Midazolam

Correct answer: A

Ketamine is a unique intravenous anesthetic that works as a non-competitive antagonist at the N-methyl-D-aspartate (NMDA) receptor. It produces a state of "dissociative anesthesia," where the patient appears awake but is detached from their environment and unresponsive to pain. Ketamine is prized for providing intense analgesia and maintaining respiratory drive and blood pressure, making it ideal for trauma or field medicine. Propofol (Option B) and Thiopentone (Option C) primarily function through the enhancement of GABA-A receptors to produce sedation. Midazolam (Option D) is a benzodiazepine that also acts on GABA receptors. Ketamine's primary drawbacks include emergence delirium and vivid dreams, which are often mitigated by combining it with a benzodiazepine. It is also being increasingly used at sub-anesthetic doses for the management of chronic pain and treatment-resistant depression.

Question 198. Which of the following is the mechanism of action of Local anesthetics?

A. Blocks Na+ channels
B. Stimulate Ca+ Channels
C. Block Cl-Channels
D. Stimulate K+ channels

Correct answer: A

Local anesthetics (such as lidocaine or bupivacaine) work by preventing the generation and conduction of nerve impulses. Their primary mechanism of action is to reversibly block voltage-gated sodium (Na+) channels on the neuronal cell membrane. By binding to the internal portion of the channel, they prevent the influx of sodium ions required for depolarization, thus halting the propagation of an action potential along the nerve fiber. They do not function by stimulating calcium channels (Option B), blocking chloride channels (Option C), or stimulating potassium channels (Option D). Local anesthetics preferentially block smaller, unmyelinated fibers (carrying pain and temperature sensations) before larger, myelinated motor fibers. This selective blockage allows for "differential blockade," where pain can be eliminated while some motor function is preserved. Toxicity can occur if the anesthetic is

injected intravascularly, leading to cardiovascular and central nervous system effects.

RADIOLOGY

281. During the procedure shown below, which substance is taken up by the cancer cells?

Question 199. Identify the radiological image of the condition given below.

A. Paget's disease

B. Multiple myeloma

C. Hyperparathyroidism

D. Sickle cell anemia

Correct answer: A

The skull X-ray demonstrates a classic “cotton wool appearance,” characterized by patchy areas of sclerosis interspersed with lytic regions. This pattern is highly suggestive of Paget’s disease of bone, a disorder involving abnormal bone remodeling. In this condition, there is excessive and disorganized activity of osteoclasts followed by osteoblasts, leading to thickened, enlarged, and structurally weak bone. The skull vault often appears widened with irregular dense patches, giving the typical cotton wool look.

Clinically, Paget’s disease may present with bone pain, deformities, increased head size, and sometimes hearing loss due to involvement of skull bones.

Why other options are incorrect:

(B)

Multiple myeloma: Produces multiple punched-out lytic lesions without surrounding sclerosis, giving a “raindrop skull” appearance.

(C)

Hyperparathyroidism: Causes a “salt and pepper skull” due to diffuse demineralization and loss of trabecular pattern.

(D)

Sickle cell anemia: Shows a “hair-on-end” appearance due to marrow hyperplasia and vertical trabeculations.

Thus, the presence of patchy sclerosis forming a cotton wool pattern confirms Paget’s disease.

Question 200. A 25-year-old man presents with low-grade fever and cough. Based on the provided chest X-ray, what is the most likely diagnosis?

A. Lung cancer

B. Miliary TB

C. ARDS

D. Aspergilloma

Correct answer: B

The Chest X-ray demonstrates numerous tiny, uniform, 1-2 mm nodules scattered symmetrically throughout both lung fields, resembling millet seeds. This is the classic radiological presentation of Miliary Tuberculosis, a form of disseminated TB resulting from hematogenous spread of the bacilli. Lung cancer (Option A) typically presents as one or more larger, irregular masses. ARDS (Option C) shows diffuse "white-out" or bilateral alveolar infiltrates rather than discrete miliary nodules. Aspergilloma (Option D) is a solid ball of fungus that typically resides in a pre-existing cavity. Miliary TB can be a life-threatening emergency, particularly in young adults or immuno compromised individuals, and may involve multiple organ systems including the liver, spleen, and bone marrow. Diagnosis is often difficult and may require high-resolution CT (HRCT) or sputum/tissue cultures. Prompt initiation of standard four-drug antitubercular therapy (ATT) is essential.

Question 201. A patient with a history of treated tuberculosis now presents with hemoptysis. Based on the given chest X-ray, what is the most likely diagnosis?

A. Bronchogenic carcinoma

B. Aspergilloma

C. Hydatid cyst

D. Lung abscess

Correct answer: B

The history of a prior TB infection combined with a Chest X-ray showing a solid mass within a pre-existing upper-lobe cavity is highly suggestive of an Aspergilloma (fungal ball). The characteristic radiological sign is the Monod sign, where a thin crescent of air surrounds the solid fungal mass. Hemoptysis is the most common and serious symptom, often occurring when the fungus erodes into adjacent blood vessels. Bronchogenic carcinoma (Option A) can also present with hemoptysis but is usually an irregular mass rather than a mass inside a cavity. Hydatid cysts (Option C) are fluid-filled and have a different appearance (like the "water-lily sign"). A lung abscess (Option D) typically shows a cavity with an air-fluid level and acute symptoms. While asymptomatic aspergillomas can be observed, those causing significant hemoptysis often require surgical resection or bronchial artery embolization, as the fungal ball is largely inaccessible to systemic antifungals.

Question 202. A 45-year-old man presents with severe abdominal pain following alcohol consumption. Based on the provided X-ray, what is the most likely diagnosis?

A. Pneumoperitoneum

B. SBO

C. Esophageal perforation

D. Pneumomediastinum

Correct answer: A

The X-ray displays a crescent-shaped pocket of air under the right dome of the diaphragm, which is the pathognomonic finding for Pneumoperitoneum (air in the abdominal cavity). In a patient with severe abdominal pain, this finding indicates a perforated hollow viscus, such as a perforated peptic ulcer or a ruptured bowel segment. SBO (Small Bowel Obstruction, Option B) would show multiple dilated bowel loops with air-fluid levels. Esophageal perforation (Option C) and pneumomediastinum (Option D) typically present with air around the heart or in the neck tissues, rather than specifically under the diaphragm. Severe pain following alcohol intake could point toward a perforated gastric or duodenal ulcer. Pneumoperitoneum is a surgical emergency requiring immediate resuscitation and urgent laparotomy to find and repair the site of perforation. Erect abdominal and chest X-rays are the standard first-line investigations for identifying this critical sign.

Question 203. Which of the following conditions is not a potential cause of the radiological finding shown below?

A. Consolidation

B. Collapse

C. Pleural effusion

D. Foreign body

Correct answer: D

The chest X-ray shows a unilateral “white-out” of one hemithorax, meaning complete opacification of one side of the chest. This radiological finding is typically seen in conditions that either fill the lung or pleural space or cause complete lung collapse.

Common causes of white-out:

1.

Consolidation: The lung is filled with inflammatory exudate, as in severe pneumonia, producing a dense opacity.

2.

Collapse (atelectasis): Loss of lung volume leads to increased density and mediastinal shift toward the affected side.

3.

Pleural effusion: Accumulation of fluid in the pleural cavity causes homogeneous opacity, often with mediastinal shift away from the affected side.

Why foreign body is incorrect:

A foreign body aspiration usually leads to localized airway obstruction, not complete white-out. Typical findings include:

1.

Segmental or lobar collapse

2.

Hyperinflation due to air trapping

3.

Patchy or focal opacity

It rarely causes complete opacification of an entire hemithorax.

Therefore, among the given options, foreign body is not a typical cause of this radiological appearance, making option (D) correct.

Question 204. A patient with a history of a fall presents to the emergency department and undergoes a CT scan of the brain (shown below). What is the most appropriate treatment for this condition?

A. Alteplase

B. Retiplase

C. Vitamin K

D. Surgery

Correct answer: C

The CT scan shows a crescent-shaped hyperdense collection along the cerebral convexity, consistent with a subdural hematoma (SDH), typically caused by rupture of bridging veins following trauma. In this case, the most appropriate treatment depends on the underlying cause and severity.

Here, the question implies conservative management, likely in a patient with coagulopathy (e.g., on anticoagulants). Therefore, Vitamin K is administered to reverse anticoagulation and promote clotting, helping to control further bleeding.

Key concept:

1.

Small or stable SDH → conservative management

2.

Correct coagulopathy → Vitamin K (if warfarin-related)

Why other options are incorrect:

(A)

Alteplase & (B)

Reteplase: Thrombolytic drugs; would worsen intracranial bleeding

(D)

Surgery: Indicated only in large hematoma or significant mass effect, not in stable cases
Thus, in a stable SDH with bleeding tendency, Vitamin K is the appropriate treatment.

Question 205. Ga-68 PSMA PET scan is used to diagnose which of the following conditions?

A. Lung cancer
B. Prostate cancer
C. Colon cancer
D. Liver cancer

Correct answer: B

Gallium-68 (Ga-68) Prostate-Specific Membrane Antigen (PSMA) PET scanning is a specialized and highly sensitive imaging modality used specifically for the diagnosis and staging of prostate cancer. PSMA is a protein that is overexpressed on the surface of most prostate cancer cells. The Ga-68 tracer binds specifically to this protein, allowing for the detection of even very small areas of cancerous tissue. It is particularly valuable for detecting localized recurrence or metastatic disease when traditional scans like bone scans or CT are negative or inconclusive. Lung cancer (Option A), colon cancer (Option C), and liver cancer (Option D) are typically staged with other modalities, most commonly FDG-PET or contrast-enhanced CT. PSMA-PET has revolutionized the management of prostate cancer by providing more accurate staging, which guides the choice between radical surgery, radiation, or systemic therapies.

Question 206. A 50-year-old woman presents with bone pain for several months. A skull X-ray is provided.
What is the most likely diagnosis?

Examination Paper June 2024 Question

A. Alanine
B. Glucose
C. Sodium
D. Calcium

Correct answer: B

The image depicts a Positron Emission Tomography (PET) scan, which is a functional imaging technique used to visualize metabolic processes in the body. The most common tracer used is Fluorodeoxyglucose (FDG), a radioactive analog of glucose. Cancer cells characteristically exhibit a high rate of glycolysis to support their rapid proliferation (the Warburg effect), and therefore avidly uptake glucose at much higher levels than normal tissues. This "hot spot" uptake allows PET scans to identify primary tumors, assess for metastatic spread, and monitor the response to treatment. Alanine (Option A), Sodium (Option C), and Calcium (Option D) are not the standard metabolic tracers used for general oncological PET imaging. Clinicians must be

aware that normal tissues with high glucose demand, like the brain and heart, will also show significant uptake. Therefore, PET results must be carefully correlated with anatomical imaging like CT or MRI.

Question 207. A 50-year-old man with a 20-year history of chronic alcohol use (about 500 ml daily) presents with sensation of insects crawling on his skin, agitation, and irritability. He reports that his last drink was 3 days ago. What is the most likely diagnosis?

A. Alcohol intoxication

B. Delirium tremens

C. Tolerance

D. Reaction due to alcohol

Correct answer: B

The patient’s symptoms are classic for Delirium Tremens (DT), the most severe form of alcohol withdrawal. DT typically develops 48 to 72 hours (3 days) after the last drink. The sensation of insects crawling on the skin is known as formication (Magnan’s sign), a specific type of tactile hallucination associated with severe withdrawal or cocaine use. Alcohol intoxication (Option A) would present with slurred speech and ataxia while drinking. Tolerance (Option C) refers to the need for increasing amounts of alcohol to achieve the same effect. "Reaction due to alcohol" (Option D) is too vague a term for this specific clinical syndrome. DT is a medical emergency characterized by confusion, hallucinations, and autonomic hyperactivity (fever, tachycardia, hypertension). Management requires high doses of benzodiazepines (like diazepam) and intensive supportive care, as it carries a significant mortality rate if left untreated.

Question 208. What is the medical term for a person who has a fear of tall buildings and looking down from heights?

A. Agoraphobia

B. Acrophobia

C. Claustrophobia

D. Nomophobia

Correct answer: B

The specific, intense fear of heights, including looking down from tall buildings, is called Acrophobia. Agoraphobia (Option A) is the fear of being in situations or places (like open spaces or crowds) where escape might be difficult or help unavailable during a panic attack. Claustrophobia (Option C) is the fear of enclosed or small spaces. Nomophobia (Option D) is the fear of being without a mobile phone or being out of cellular contact. Acrophobia is one of the

most common specific phobias and can cause significant distress or avoidance behavior. Patients may experience dizziness, sweating, or a sense of "pulling" toward the edge when exposed to heights. Treatment usually involves Cognitive Behavioral Therapy (CBT), specifically exposure therapy, where the person is gradually and systematically exposed to feared heights in a safe environment to reduce the anxiety response.

Question 209. A mother brings her daughter with complaints that she eats excessively and then induces vomiting after meals. She is conscious about her weight, and her BMI is 25. What is the most likely diagnosis?

A. Anorexia nervosa

B. Binge eating disorder

C. Bulimia nervosa

D. OCD

Correct answer: C

The patient’s behavior of binge eating followed by compensatory self-induced vomiting, coupled with an intense preoccupation with body weight and a normal BMI (25), is diagnostic for Bulimia Nervosa. Anorexia nervosa (Option A) is characterized by severe food restriction and an abnormally low body weight. Binge eating disorder (Option B) involves episodes of eating excessive amounts of food but lacks the subsequent compensatory purging behaviors (vomiting, laxatives, or excessive exercise). OCD (Option D) is characterized by obsessions and compulsions but is not primarily an eating disorder. Bulimia nervosa can lead to serious health issues, including electrolyte imbalances, dental erosion (from stomach acid), and parotid gland enlargement. Management typically involves a combination of nutritional counseling and Cognitive Behavioral Therapy (CBT). Fluoxetine is the only FDA-approved medication for the treatment of bulimia.

Question 210. A chronic alcoholic presents with agitation, global confusion, disorientation, hallucinations, fever, hypertension, diaphoresis, and autonomic hyperactivity after 48 hours of alcohol cessation. What is the most likely diagnosis?

A. Delirium tremens

B. Wernicke Encephalopathy

C. Korsakoff Psychosis

D. Magnan Phenomena

Correct answer: A

The patient's clinical presentation of agitation, global confusion, and autonomic hyperactivity

(fever, hypertension, diaphoresis) starting 48 hours after the cessation of alcohol is the hallmark of Delirium Tremens (DT). DT is the most severe manifestation of alcohol withdrawal and is a medical emergency. Wernicke Encephalopathy (Option B) presents with the triad of confusion, ataxia, and ophthalmoplegia due to thiamine deficiency. Korsakoff Psychosis (Option C) is a chronic memory disorder following Wernicke's, characterized by confabulation. Magnan Phenomena (Option D), or formication, is a sensory hallucination of crawling insects that can occur within the context of DT but is not the diagnosis itself. DT requires aggressive treatment with benzodiazepines and intravenous fluids to prevent cardiovascular collapse and death. Its high mortality rate necessitates immediate hospitalization in an intensive care setting for close monitoring of vital signs and neurological status.

Question 211. A patient presents with low mood, loss of appetite, excessive sleep, and low energy persisting for 2 months. She had a similar episode 5 months ago that resolved with medication. What is the most likely disorder?

A. Depression

B. Recurrent depressive disorder

C. Dysthymia

D. Cyclothymia

Correct answer: B

The patient is experiencing a second distinct episode of classic depressive symptoms (low mood, energy, and changes in appetite and sleep) lasting at least two weeks. The history of a previous episode that responded to treatment five months ago defines this as Recurrent Depressive Disorder. While she is currently depressed (Option A), "recurrent" is the most specific diagnosis describing her longitudinal course. Dysthymia (Option C) is a chronic, low-grade depression lasting for at least two years without remission. Cyclothymia (Option D) involves a two-year period of fluctuating periods of mild depression and mild elevation (hypomania). Recurrent depressive disorder is a common psychiatric condition requiring long-term maintenance therapy with antidepressants to prevent further relapses. Each subsequent episode increases the risk of future recurrences, making consistent pharmacological and psychotherapeutic intervention critical for the patient's long-term functional stability.

Question 212. Which of the following is not a defense mechanism?

A. Sublimation

B. Displacement

C. Replacement

D. Altruism

Correct answer: C

Defense mechanisms are unconscious psychological strategies used by the mind to cope with anxiety and protect the self. Replacement is not a recognized psychological defense mechanism in standard psychoanalytic theory. Sublimation (Option A) is a mature defense mechanism where socially unacceptable impulses are transformed into socially acceptable actions. Displacement (Option B) involves redirecting an emotional impulse from its original target to a less threatening one. Altruism (Option D) is a mature defense where one deals with conflict by meeting the needs of others. Other common mechanisms include denial, projection, and reaction formation. Recognizing these mechanisms is essential in psychiatry and clinical practice to understand how patients cope with trauma and emotional stress. While "replacement" might describe a simple substitution in behavior, it does not fulfill the theoretical definition of an unconscious ego defense.

****

(A) Chancre

(B) Chancroid

(C) Donovanosis

(D) Herpes

AAns

(B)Chancroid

The clinical presentation of multiple, painful genital ulcers associated with painful regional lymphadenopathy (buboes) is the classic hallmark of Chancroid. Chancroid is a sexually transmitted infection caused by the gram-negative bacterium Haemophilus ducreyi. A chancre (Option A), seen in primary syphilis, is characteristically a painless ulcer with a clean base and painless lymph nodes. Donovanosis (Option B) presents with painless, "beefy-red," granulomatous ulcers that bleed easily, without significant lymphadenopathy. Herpes simplex (Option D) typically presents with multiple, very painful, superficial vesicles that rupture to form shallow ulcers, rather than the deeper, necrotic ulcers of chancroid. Chancroid is often described as having a "dirty" base with undermined edges. Treatment involves macrolide antibiotics like azithromycin or ceftriaxone. This condition is an important risk factor for the transmission of HIV.