INI-CET May 2021 Question Paper

146 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. Pelvic diaphragm is formed by the following muscles:

A. Pubococcygeus

B. Iliococcygeus

C. Pubovaginalis

D. All of the above

Correct answer: D

All of the above The pelvic diaphragm is a crucial funnel-shaped muscular structure that forms the floor of the pelvic cavity, supporting the pelvic organs. It is composed of the levator ani and coccygeus muscles. The levator ani muscle is not a single muscle but a complex sheet made up of several interconnected parts. The main components of the levator ani are the iliococcygeus and the pubococcygeus muscles. The pubococcygeus is further subdivided based on its fiber attachments. In females, the most medial fibers of the pubococcygeus that flank the vagina are specifically referred to as the pubovaginalis muscle. This part is critical for vaginal support and sphincter function. Since the pubococcygeus, iliococcygeus, and pubovaginalis are all integral components of the levator ani complex, and the levator ani is the main constituent of the pelvic diaphragm, all the listed options are correct.

Question 2. When the outer sheath and nerve fiber remain intact but the inner axons are damaged, this condition is known as what?:

A. Neurapraxia

B. Axonapraxia

C. Axonotmesis

D. Neurotmesis

Correct answer: C

Axonotmesis This question refers to Seddon's classification of peripheral nerve injuries, which has three main types. Neurapraxia (A) is the mildest form, involving a temporary block of nerve conduction, usually due to focal demyelination, without any axonal damage. The nerve sheaths and axon are intact, and recovery is complete. Neurotmesis (D) is the most severe form, where the entire nerve trunk, including the axons and all surrounding connective tissue sheaths (endoneurium, perineurium, and epineurium), is completely transected. Recovery does not

occur without surgical repair. Axonotmesis is the intermediate injury, defined by the disruption of the inner axons and their myelin sheaths, but with the connective tissue framework of the nerve, including the endoneurial tube ("outer sheath"), remaining intact. This leads to Wallerian degeneration distal to the injury, but the intact sheath provides a scaffold for potential axonal regeneration, making recovery possible but slow.

Question 3. Which of the following does not enhance the production of gastric acid?

A. Gastrin

B. Histamine

C. Acetylcholine

D. Serotonin

Correct answer: D

Serotonin The secretion of gastric acid from parietal cells in the stomach is stimulated by three main physiological agonists. Gastrin (A), a hormone released from G cells in the stomach antrum, stimulates acid secretion both directly and indirectly by promoting histamine release. Histamine (B), released from enterochromaffin-like (ECL) cells, is a powerful paracrine stimulator of parietal cells via H2 receptors. Acetylcholine (C), released from vagal nerve endings, stimulates parietal cells directly via M3 muscarinic receptors. These three substances work synergistically to promote acid production. Serotonin (5-HT) (D), while abundant in the gastrointestinal tract where it primarily regulates motility and secretion in the intestines, is not a primary stimulant for gastric acid production. In fact, some subtypes of serotonin receptors have been shown to have an inhibitory effect on acid secretion. Therefore, among the options provided, serotonin is the one that does not enhance gastric acid production.

Question 4. Which of the following options demonstrates the highest airway resistance?

A. Alveolar duct

B. Bronchi

C. Respiratory bronchioles

D. Small bronchioles

Correct answer: B

Bronchi Airway resistance is determined by the caliber and arrangement of the airways. While one might intuitively think that the smallest airways would have the highest resistance, this is incorrect. The total cross-sectional area of the airways is the key factor. Although an individual small bronchiole has a very high resistance, the airways branch extensively, and there are millions of small bronchioles (D) and respiratory bronchioles (C) arranged in parallel. This parallel arrangement results in a massive total cross-sectional area, leading to very low overall resistance in the peripheral airways. In contrast, the medium-sized bronchi (specifically, the segmental bronchi, from the 3rd to 7th generation of branching) represent a point where the

total cross-sectional area is at its minimum. This bottleneck in the airway tree is the site of the greatest level of airway resistance in the entire respiratory system. The trachea and main bronchi have a larger diameter, resulting in lower resistance.

Question 5. In a situation where cardiac contractility decreases, which of the following changes is most likely to occur?

A. Decreased end-diastolic volume and pressure

B. Shift of the end-systolic volume and pressure curves to the right

C. Increased stroke volume

D. Enhanced response to sympathetic stimulation

Correct answer: B

Shift of the end-systolic volume and pressure curves to the right Reduced cardiac contractility, or negative inotropy, means that for any given preload (end-diastolic volume), the heart muscle contracts less forcefully. This is depicted on a ventricular pressure-volume loop analysis. The end-systolic pressure-volume relationship (ESPVR) is a line that represents the maximum pressure the ventricle can generate at any given volume, and its slope is a measure of contractility. When contractility is reduced, the ventricle is weaker, so for any given systolic pressure, the end-systolic volume will be larger. This causes the ESPVR curve to become less steep and shift downwards and to the right. Consequently, for a given preload and afterload, the stroke volume (C) will decrease, not increase, and the end-systolic volume will be larger. The end-diastolic volume (A) might increase as a compensatory mechanism, but it does not decrease.

Question 6. Which of the following ions does not show a reduced concentration in the lumen of the proximal convoluted tubule?

A. Amino acids

B. Glucose

C. Chloride

D. Bicarbonate

Correct answer: C

Chloride The proximal convoluted tubule (PCT) is responsible for reabsorbing the majority (about 65-70%) of the glomerular filtrate. This includes the near-complete reabsorption of valuable organic solutes like glucose (B) and amino acids (A) via sodium-coupled secondary active transport. A large amount of bicarbonate (D) is also reabsorbed in the PCT, a process linked to sodium-hydrogen exchange and carbonic anhydrase activity. As these solutes and a significant amount of sodium are reabsorbed, their concentration in the tubular fluid decreases progressively along the PCT. Water follows these solutes osmotically. However, chloride (C) is reabsorbed more slowly in the early PCT compared to sodium and water. As water is reabsorbed, the concentration of the less readily reabsorbed chloride ions in the remaining

tubular fluid actually increases along the length of the PCT. This creates a favorable concentration gradient for its passive paracellular reabsorption in the later parts of the PCT.

Question 7. Which of the following tests would you use to identify an acid–base imbalance in a patient? 1. Arterial pH 2. Venous pH 3. Venous pO 2 4. Venous pCO 2

A. 1,2

B. 1,2,3

C. 1,2,4

D. 1,2,3,4

Correct answer: C

1,2,4 BIOCHEMISTRY

Question 8. Methyl-tetrahydro-folic acid gets accumulated in deficiency of which of the following?

A. B2

B. B12

C. B1

D. B6

Correct answer: B

B12 This question refers to the "folate trap" hypothesis, which explains the biochemical link between Vitamin B12 and folate deficiency. The enzyme methionine synthase is responsible for converting homocysteine to methionine. This reaction requires two things : Vitamin B12 (in the form of methylcobalamin) as a cofactor, and N5-methyl-tetrahydrofolate (methyl-THF) as a methyl group donor. In the process, methyl-THF is converted back to tetrahydrofolate (THF), which can then be used to synthesize other folate derivatives needed for DNA synthesis. In Vitamin B12 deficiency, the methionine synthase enzyme cannot function properly. As a result, folate becomes "trapped" in its N5-methyl-THF form, as this is an irreversible reaction. This accumulation of methyl-THF prevents the regeneration of THF, leading to a functional folate deficiency and impairing DNA synthesis, which results in megaloblastic anemia.

Question 9. Which of the following statements is not correct about a patient with advanced liver disease?

A. Hyperammonemia

B. Decreased ATP synthesis

C. Oxidative decarboxylation of alpha- ketoglutarate

D. Increased synthesis of glutamine and glutamine from alpha-ketoglutarate

Correct answer: C

Oxidative decarboxylation of alpha-ketoglutarate In advanced liver disease, the liver's capacity to detoxify ammonia via the urea cycle is severely impaired, leading to hyperammonemia (A).

This excess ammonia is shunted to other tissues, particularly the brain and skeletal muscle. In the brain's astrocytes, ammonia is detoxified by combining with glutamate to form glutamine, a reaction catalyzed by glutamine synthetase. To replenish the glutamate used in this reaction, alpha-ketoglutarate (an intermediate of the Krebs cycle) is reductively aminated to glutamate. This leads to an increased synthesis of glutamine from alpha-ketoglutarate (D). This depletion of alpha-ketoglutarate from the Krebs cycle impairs aerobic respiration and leads to decreased ATP synthesis (B) in astrocytes, contributing to hepatic encephalopathy. The statement that oxidative decarboxylation of alpha-ketoglutarate (C) occurs is incorrect in this context; rather, it is the depletion of alpha-ketoglutarate via reductive amination that is the key pathological step.

Question 10. Which of the following options is not a substrate used in the synthesis of glucose?

A. Acetyl coenzyme A

B. Glycerol

C. Alanine

D. Lactate

Correct answer: A

Acetyl coenzyme A Gluconeogenesis is the metabolic pathway that synthesizes glucose from non-carbohydrate precursors. The major substrates for gluconeogenesis are lactate (D) (from anaerobic glycolysis, via the Cori cycle), glucogenic amino acids like alanine (C) (from muscle protein breakdown, via the glucose-alanine cycle), and glycerol (B) (from the breakdown of triglycerides in adipose tissue). These substrates can all be converted into pyruvate or other intermediates of the Krebs cycle, which can then be used to form glucose. However, acetyl-CoA (A), which is derived from the beta-oxidation of fatty acids, cannot be used for the net synthesis of glucose in humans. This is because the conversion of pyruvate to acetyl-CoA by the pyruvate dehydrogenase complex is an irreversible reaction. There is no pathway in humans to convert acetyl-CoA back to pyruvate or oxaloacetate for entry into gluconeogenesis.

Question 11. Which of the following concepts of the genetic code does the wobble hypothesis elucidate?

A. Universal

B. Unambiguous

C. Degeneracy

D. Non-punctuated Click Here to Buy book on Amazon MEDINK

Correct answer: A

1,2,3 and 4 The inferior thyroid artery is a major branch of the thyrocervical trunk, which arises from the first part of the subclavian artery. It ascends toward the thyroid gland and then turns medially behind the carotid sheath to reach the lower pole of the thyroid. It plays a significant role in supplying several structures in the neck. First, it supplies the thyroid gland, particularly

its inferior and posterior parts. Second, it provides branches to the parathyroid glands, which are usually located on the posterior surface of the thyroid. These small glands depend largely on the inferior thyroid artery for their blood supply. Third, esophageal branches arise from the inferior thyroid artery to supply the cervical part of the esophagus. Fourth, small branches also contribute to the blood supply of the thymus, especially in children, where the thymus extends into the lower neck. Thus, the inferior thyroid artery supplies the thyroid gland, parathyroid glands, esophagus, and thymus. Therefore, the correct answer is (A) 1, 2, 3, and 4.

Question 12. What repair mechanism is linked to CRISPR- Cas9?

A. Non-homologous end joining

B. Base excision repair

C. Nucleotide excision repair

D. Mismatch repair

Correct answer: A

Non-homologous end joining The CRISPR-Cas9 genome editing system functions by creating a targeted double-strand break (DSB) in the DNA. Once this break is made, the cell utilizes its own endogenous DNA repair pathways to fix it. The cell has two major pathways for repairing DSBs. The predominant, default, and most frequently used pathway is non-homologous end joining (NHEJ). This pathway is efficient but error-prone; it often introduces small, random insertions or deletions (indels) at the site of the break as it ligates the two ends back together. This is the mechanism that researchers exploit to create gene knockouts, as the resulting indel often causes a frameshift mutation that inactivates the gene. The other repair pathways listed—base excision repair (B), nucleotide excision repair (C), and mismatch repair (D)—are responsible for fixing different types of DNA damage, such as single-base errors or bulky adducts, not double-strand breaks.

Question 13. Which of the following substances is not characterized by amphipathicity?

A. Sphingolipids

B. Phosphoglycerol

C. Triglycerides

D. Glycolipids

Correct answer: C

Triglycerides An amphipathic (or amphiphilic) molecule is one that possesses both a hydrophilic ("water-loving") polar head and a hydrophobic ("water-fearing") nonpolar tail. This dual nature allows these molecules to form structures like micelles and lipid bilayers in aqueous environments. Phosphoglycerols (B) (a major class of phospholipids), sphingolipids (A), and glycolipids (D) are all major components of cell membranes and are all amphipathic. They each have a polar head group (containing phosphate, choline, or a carbohydrate moiety) attached to

nonpolar fatty acid tails. In contrast, triglycerides (also called triacylglycerols) are the main form of stored fat. They are composed of a glycerol backbone esterified to three fatty acid chains. This structure is almost entirely nonpolar and hydrophobic. Since they lack a distinct polar head group, triglycerides are not amphipathic and are stored as oily droplets within cells.

Question 14. Which process explains how organophosphorus compounds inhibit the acetylcholinesterase enzyme?

A. Non-competitive inhibition

B. Reversible competitive inhibition

C. Irreversible competitive inhibition

D. Suicidal inhibition

Correct answer: D

Suicidal inhibition Organophosphorus compounds inhibit acetylcholinesterase (AChE) by forming a covalent bond with the enzyme at its active site. Normally, acetylcholinesterase breaks down acetylcholine into acetate and choline, thereby terminating synaptic transmission. However, organophosphates phosphorylate the serine hydroxyl group present in the active site of the enzyme. This phosphorylation initially forms a stable enzyme–inhibitor complex. Over time, a process called “aging” occurs, in which the bond becomes even more stable and resistant to hydrolysis. As a result, the enzyme becomes permanently inactivated and cannot regenerate under normal physiological conditions. This mechanism is referred to as suicidal inhibition (mechanism-based inhibition) because the inhibitor binds to the active site and is processed as if it were a substrate, but instead permanently inactivates the enzyme. It differs from reversible competitive inhibition because the bond formed is covalent and essentially irreversible. The accumulation of acetylcholine at synapses leads to continuous stimulation of muscarinic and nicotinic receptors, producing the characteristic cholinergic toxicity seen in organophosphate poisoning.

Question 15. In the formula for urea clearance $(U\times V)/ P$ what does U represent?

A. Urine volume

B. Serum urea in mg/100 ml

C. Urine urea in g/24h

D. Urine urea in mg/100 ml

Correct answer: D

Urine urea in mg/100 ml The formula presented is the standard formula for calculating the renal clearance of any substance : Clearance = (U × V) / P. In this formula, each component represents a specific measurement, and it is crucial that the units are consistent. V represents the urine flow rate (urine volume per unit time), typically expressed in mL/min. P represents the plasma concentration of the substance, usually expressed in mg/dL or mg/100 mL. U represents

the urine concentration of the substance. To ensure the units cancel out correctly to give a final clearance value in mL/min, the urine concentration (U) must be expressed in the same units as the plasma concentration (P). Therefore, U represents the concentration of urea in the urine, expressed in mg/100 mL (or mg/dL). Expressing it in different units like g/24h (C) would require a conversion before it could be used in this formula.

Question 16. To inhibit translation, which region of the mRNA does miRNA bind to?

A. Gene body

B. Gene promoter

C. 3 l UTR

D. 5' UTR

Correct answer: C

$3^{\prime}$ UTR MicroRNAs (miRNAs) are small, non-coding RNA molecules that play a crucial role in the post-transcriptional regulation of gene expression. They function by binding to complementary sequences on target messenger RNA (mRNA) molecules. This binding is mediated by a protein complex called the RNA-induced silencing complex (RISC). In animals, the miRNA binding sites are most commonly located in the 3' untranslated region (3' UTR) of the target mRNA. The binding of the miRNA-RISC complex to the 3' UTR typically does not involve perfect complementarity. This imperfect pairing leads to the inhibition of the translation of the mRNA into protein and often promotes the deadenylation and eventual degradation of the mRNA molecule. Binding to the gene promoter (B) or gene body (A) relates to transcriptional regulation at the DNA level, not post-transcriptional regulation of mRNA.

Question 17. Which of the following methods is not appropriate for causing protein precipitation?

A. Adding alcohol and acetone

B. Using heavy metal ions

C. Moving pH away from isoelectric pH

D. Adding trichloroacetic acid

Correct answer: C

Moving pH away from isoelectric pH Protein precipitation is a process where proteins are made to come out of solution. A protein's solubility is at its minimum at its isoelectric point (pI). The pI is the specific pH at which the net electrical charge of the protein is zero. At this pH, the repulsive electrostatic forces between protein molecules are minimal, allowing them to aggregate and precipitate more easily. Therefore, moving the pH towards the pI is a method used to precipitate proteins. Moving the pH away from the isoelectric pH (C) will increase the net charge on the protein molecules, leading to increased electrostatic repulsion between them and thus increasing their solubility, which is the opposite of precipitation. The other methods listed are all common techniques for precipitating proteins : adding organic solvents like alcohol

and acetone (A), using heavy metal ions like mercury or lead (B), and adding strong acids like trichloroacetic acid (D) all work by disrupting the protein's hydration shell or neutralizing its charge, leading to precipitation.

Question 18. Select the incorrect statement concerning suicide inhibition.

A. The inhibitor can bind with any site resulting in suicidal inhibition

B. The binding of the enzyme to the substrate analogue is irreversible

C. They are enzyme specific and used in rational drug design

D. The inhibitor forms a product with the enzyme and the product inhibits it

Correct answer: A

The inhibitor can bind with any site resulting in suicidal inhibition This statement is incorrect. Suicide inhibition is a highly specific process. A suicide inhibitor, also known as a mechanism-based inactivator, is an unreactive molecule that is structurally similar to the substrate of a specific enzyme. It binds to the enzyme's active site just like a normal substrate. The enzyme then proceeds with its normal catalytic mechanism, but in doing so, it converts the inhibitor into a highly reactive intermediate. This reactive intermediate then binds covalently and irreversibly to a residue within the active site, permanently inactivating the enzyme. Therefore, the inhibitor must bind specifically to the active site; it cannot bind to "any site" to cause this effect. The other statements are correct : the binding is ultimately irreversible (B), the high specificity makes it a valuable tool for rational drug design (C), and the enzyme's own action creates the reactive product that inhibits it (D). PATHOLOGY

Question 19. Which factor is responsible for triggering an aplastic crisis in patients with hereditary spherocytosis?

A. Poxvirus

B. Epstein-Barr virus

C. Adenovirus

D. Parvovirus

Correct answer: D

Parvovirus Patients with chronic hemolytic anemias, such as hereditary spherocytosis or sickle cell disease, rely on a highly accelerated rate of red blood cell production (erythropoiesis) in their bone marrow to compensate for the shortened lifespan of their red cells. An aplastic crisis is a sudden, transient cessation of this erythropoiesis, leading to a rapid and severe drop in hemoglobin levels without the normal compensatory reticulocytosis. The most common infectious agent that triggers an aplastic crisis in these patients is Parvovirus B19. This virus has a specific tropism for and infects erythroid precursor cells (pronormoblasts) in the bone marrow, causing them to stop dividing. In a person with normal red cell survival, this temporary halt in production is clinically insignificant. However, in a patient with a chronic hemolytic anemia, it leads to a rapid and life-threatening anemia. Epstein-Barr virus (B) is associated with

infectious mononucleosis.

Question 20. Which specific cell plays a role in type IV (delayed-type) hypersensitivity?

A. Cytotoxic T cell

B. Macrophage

C. Dendritic cell

D. Neutrophil

Correct answer: A

Cytotoxic T cell Type IV hypersensitivity, also known as delayed-type hypersensitivity (DTH), is a T-cell mediated immune response that takes 24-72 hours to develop. The classic example is the tuberculin skin test. The reaction is initiated by antigen-specific Th1 helper T-cells. When these sensitized Th1 cells are re-exposed to an antigen presented by antigen-presenting cells, they become activated and release a profile of pro-inflammatory cytokines, most notably Interferon-gamma (IFN- γ). The primary function of IFN- γ is to be a potent activator of macrophages. These activated macrophages are the principal effector cells of the DTH reaction. They become enlarged, highly phagocytic, and release lytic enzymes and other inflammatory mediators that are responsible for the tissue damage, induration, and inflammation characteristic of the DTH lesion. While cytotoxic T cells (A) are involved in a different subtype of Type IV hypersensitivity, the classic DTH reaction is mediated by cytokine release from Th1 cells that activates macrophages.

Question 21. Which of the following is not a product of heme catabolism?

A. Ferrous ion

B. Aminolevulinic acid

C. Biliverdin

D. Carbon monoxide

Correct answer: B

Aminolevulinic acid Heme catabolism is the process of breaking down the heme component of hemoglobin from old red blood cells. The process begins in macrophages. The first step is catalyzed by the enzyme heme oxygenase, which opens the heme ring. This single reaction produces three products : 1. Biliverdin (C), a green pigment. 2. Carbon monoxide (CO) (D), which is exhaled. 3. Ferrous iron (Fe^{2+}) (A), which is released and recycled, transported in the blood by transferrin. Biliverdin is then subsequently reduced to bilirubin. In contrast, delta-aminolevulinic acid (ALA) (B) is not a product of heme breakdown; it is a precursor molecule in the synthesis of heme. It is formed in the first step of the heme synthesis pathway by the condensation of glycine and succinyl-CoA, a reaction catalyzed by ALA synthase.

Question 22. A male with hyperpigmentation, Tanner stage 5, hypertension, and

signs of precocious puberty is evaluated. What is the most likely underlying defect?

A. 21-Beta hydroxylase deficiency

B. 11-Beta hydroxylase deficiency

C. 17-Beta hydroxylase deficiency

D. 17-Alpha hydroxylase deficiency

Correct answer: B

11-Beta hydroxylase deficiency This patient's presentation of precocious puberty (early virilization), hypertension, and hyperpigmentation points to a specific form of congenital adrenal hyperplasia (CAH). In 11-beta-hydroxylase deficiency, the final step in cortisol synthesis is blocked. This leads to low cortisol levels, which results in a loss of negative feedback to the pituitary and a subsequent overproduction of ACTH. The excess ACTH causes adrenal hyperplasia and the shunting of steroid precursors towards the androgen synthesis pathway, leading to high levels of androgens and causing precocious puberty. The ACTH precursor, POMC, also contains the MSH sequence, leading to hyperpigmentation. The enzymatic block also leads to the accumulation of the precursor 11-deoxycorticosterone (DOC), a potent mineralocorticoid. The excess DOC causes sodium and water retention, leading to hypertension and hypokalemia. In contrast, 21-hydroxylase deficiency (A) is associated with salt wasting and hypotension. 17-alpha-hydroxylase deficiency (D) impairs both cortisol and sex steroid synthesis, preventing puberty.

Question 23. Which of the following statements is true? 1. BRCA1 is an oncogene. 2. HER2/neu is amplified only in a fraction of breast cancers. 3. EGFR positivity is seen in non-small cell lung cancer. 4. N-MYC is a tumor suppressor gene.

A. 1,2

B. 1,3

C. 2,3

D. All of the above

Correct answer: C

2,3 1. Incorrect. BRCA1 is a tumor suppressor gene, not an oncogene. It is involved in DNA repair, and its inherited loss-of-function mutations increase the risk of breast and ovarian cancer. 2. Correct. The HER2/neu gene (also known as ERBB2) is a proto-oncogene that encodes a receptor tyrosine kinase. Amplification or overexpression of HER2 occurs in a subset, or fraction, of breast cancers (approximately 15-20%) and is associated with a more aggressive phenotype. It is a key therapeutic target. 3. Correct. Activating mutations in the Epidermal Growth Factor Receptor (EGFR) gene are found in a significant subset of non-small cell lung cancers (NSCLC), particularly in adenocarcinomas in non-smokers. EGFR positivity is a critical biomarker for guiding targeted therapy with EGFR tyrosine kinase inhibitors. 4. Incorrect. N-MYC is a well-known proto-oncogene, not a tumor suppressor gene. Its amplification is a key driver

and a marker of poor prognosis in neuroblastoma.

Question 24. What condition can be avoided by administering irradiated red blood cells?

A. Graft-versus-host disease

B. HLA alloimmunization

C. Immuno modulation

D. Transfusion-Related Acute Lung Injury (TRALI)

Correct answer: A

Graft-versus-host disease Irradiation of cellular blood products (red blood cells and platelets) is a specific procedure performed to prevent a rare but often fatal complication of transfusion known as Transfusion-Associated Graft-versus-Host Disease (TA-GVHD). This condition occurs when viable donor T-lymphocytes present in the transfused blood product engraft in an immuno compromised or immunologically similar recipient. These donor lymphocytes then recognize the recipient's tissues as foreign and mount an immune attack against them, leading to severe damage to the skin, liver, and gastrointestinal tract. Gamma irradiation or X-irradiation of the blood product damages the DNA of the donor lymphocytes, rendering them incapable of proliferating and thus preventing their ability to cause TA-GVHD. Irradiation does not prevent HLA alloimmunization (B), immuno modulation (C), or TRALI (D), which have different pathophysiological mechanisms.

Question 25. What distinctive feature would be seen on electron microscopy in a patient with suspected Langerhans cell histiocytosis who presents with skull lytic lesions?

A. Histiocytes

B. Birbeck granules

C. Eosinophils

D. Giant cells

Correct answer: B

Birbeck granules Langerhans cell histiocytosis (LCH) is a rare disease characterized by the abnormal proliferation of Langerhans cells, a type of dendritic cell. Patients often present with lytic bone lesions, particularly in the skull. While light microscopy of a biopsy will show an infiltrate of Langerhans cells (histiocytes) mixed with eosinophils and other inflammatory cells, the definitive and pathognomonic finding is seen on electron microscopy. Langerhans cells in LCH contain unique, rod-shaped or "tennis racket"-shaped cytoplasmic organelles called Birbeck granules. The presence of these specific granules within the neoplastic cells is diagnostic of LCH. While histiocytes (A), eosinophils (C), and giant cells (D) are all seen on a standard H&E stained slide, the Birbeck granule is the specific ultrastructural marker that defines the cell type involved in this disease.

Question 26. Which immunoglobulin is mainly responsible for causing facial swelling, itching, and hypotension in a person who presents to the emergency department after a bee sting?

A. IgA

B. IgE

C. IgM

D. IgG

Correct answer: B

IgE The patient is experiencing a systemic allergic reaction, or anaphylaxis, triggered by a bee sting. This is a classic example of a Type I (immediate) hypersensitivity reaction. This type of reaction is mediated by Immunoglobulin E (IgE) antibodies. In a previously sensitized individual, specific IgE antibodies against bee venom antigens are bound to the surface of mast cells and basophils. Upon re-exposure to the venom (the bee sting), the antigens cross-link these surface-bound IgE molecules. This cross-linking triggers the rapid degranulation of the mast cells, releasing a massive amount of pre-formed and newly synthesized inflammatory mediators, such as histamine and leukotrienes. These mediators are responsible for the clinical manifestations of anaphylaxis, including vasodilation (causing hypotension), increased vascular permeability (causing facial swelling or angioedema), and smooth muscle contraction.

Question 27. What is the underlying pathophysiological process in a 42-year-old woman who presents with cough, low-grade fever, and hemoptysis, and whose biopsy from a cavitary lesion in the right lung apex reveals caseous necrosis?

A. Enzyme degradation

B. Type IV hypersensitivity reaction

C. Fibrinoid deposition

D. Sudden cut off of blood supply

Correct answer: B

Type IV hypersensitivity reaction The clinical and pathological findings—a cavitary lesion in the lung apex with caseous necrosis on biopsy—are pathognomonic for post-primary (reactivation) tuberculosis. The tissue damage and granuloma formation seen in tuberculosis are not caused directly by the Mycobacterium tuberculosis bacillus itself, which has low intrinsic virulence. Instead, the pathology is the result of the host's own immune response to the infection. Specifically, it is a cell-mediated immune response, which is a classic example of a Type IV or delayed-type hypersensitivity (DTH) reaction. Sensitized CD4+ Th1 lymphocytes recognize mycobacterial antigens and release cytokines, particularly interferon-gamma. This activates macrophages, transforming them into epithelioid histiocytes, which form the granulomas. The prolonged, intense DTH reaction leads to the characteristic cheesy, friable necrosis in the center of the granuloma, known as caseous necrosis, which is responsible for the tissue

destruction and cavity formation.

Question 28. Which further diagnostic investigations should be pursued for a 65-year-old man who presents with persistent fatigue, lymphadenopathy, and smudge cells noted on a peripheral blood smear?

A. Polymerase chain reaction (PCR)

B. Fluorescent in situ hybridization (FISH)

C. Flow cytometry

D. Cytogenetics

Correct answer: C

Flow cytometry The patient's presentation with lymphadenopathy, fatigue, and smudge cells on the peripheral smear is highly suggestive of Chronic Lymphocytic Leukemia (CLL). While the blood smear is characteristic, the definitive diagnosis and confirmation are made by immunophenotyping of the circulating lymphocytes using flow cytometry. This technique uses fluorescently-labeled antibodies to identify a specific profile of cell surface markers (CD antigens) on the leukemic cells. The classic immunophenotype for CLL is the co-expression of the B-cell markers CD19 and CD20, along with the aberrant expression of the T-cell marker CD5. The cells also typically express CD23 and have dim surface immunoglobulin expression. This specific marker profile confirmed by flow cytometry is the gold standard for diagnosing CLL and distinguishing it from other B-cell lymphoproliferative disorders. FISH (B) and cytogenetics (D) are important for prognostication (e.g., detecting del17p) but not for the primary diagnosis.

Question 29. What genetic abnormality is most likely in a male patient who presents with fever, night sweats, and neck swelling, and whose biopsy reveals a starry-sky pattern?

A. MYC

B. RAS

C. BCR-ABL

D. p53

Correct answer: A

MYC The combination of constitutional "B" symptoms (fever, night sweats), a rapidly growing mass (neck swelling), and a biopsy with a "starry sky" appearance is classic for Burkitt lymphoma. Burkitt lymphoma is a highly aggressive B-cell non-Hodgkin lymphoma. The "starry sky" histology is created by a diffuse infiltrate of uniform, medium-sized tumor cells (the "dark sky") interspersed with numerous benign tangible body macrophages (the "stars") that are phagocytosing apoptotic tumor cells, reflecting the tumor's extremely high proliferation rate. The defining genetic abnormality in virtually all cases of Burkitt lymphoma is a translocation involving the MYC proto-oncogene on chromosome 8. The most common translocation, t(8;14), places the MYC gene under the control of the strong immunoglobulin heavy chain gene

enhancer, leading to its massive overexpression and driving uncontrolled cell proliferation.

Question 30. Which of the following symptoms is least likely to occur in a patient with Paroxysmal Nocturnal Hemoglobinuria (PNH)?

A. Aplastic anemia

B. Leukemia

C. Thrombosis

D. Hemolysis

Correct answer: B

Leukemia Paroxysmal Nocturnal Hemoglobinuria (PNH) is a rare, acquired clonal stem cell disorder caused by a somatic mutation in the PIGA gene. This leads to a deficiency of GPI-anchored proteins (like CD55 and CD59) on the surface of blood cells, making them susceptible to complement-mediated destruction. The clinical triad of PNH includes : Intravascular hemolysis (D), leading to anemia and hemoglobinuria. A very high risk of venous and arterial thrombosis (C), often in unusual sites like the hepatic or portal veins, which is a major cause of mortality. Variable degrees of bone marrow failure, which can manifest as or evolve into aplastic anemia (A). While PNH is a clonal disorder and carries a small long-term risk of transformation to myelodysplastic syndrome or acute myeloid leukemia, leukemia (B) is by far the least common manifestation of the disease compared to the cardinal features of hemolysis, thrombosis, and bone marrow failure.

Question 31. For which interpretation of HER2/neu status is Fluorescence In-Situ Hybridization (FISH) indicated?

A. 1+

B. 2+

C. 3+

D. All of the above

Correct answer: B

2+ The HER2/neu status of a breast cancer is a critical biomarker for determining eligibility for anti-HER2 targeted therapies like trastuzumab. The initial assessment is typically done by immunohistochemistry (IHC), which stains for the HER2 protein on the surface of tumor cells. The result is scored from 0 to 3+. A score of 0 or 1+ is considered HER2 negative. A score of 3+ (strong, complete membrane staining in >10% of tumor cells) is considered HER2 positive. A score of 2+ is considered equivocal or borderline. According to ASCO/CAP guidelines, when the IHC result is equivocal (2+), reflex testing with Fluorescence In-Situ Hybridization (FISH) is required to make a definitive determination. FISH is a molecular test that directly counts the number of copies of the HER2 gene within the tumor cell nuclei to assess for gene amplification. A positive FISH result will then classify the 2+ case as HER2 positive.

Question 32. In evaluating a patient for resistant hypertension, their blood pressure remains uncontrolled despite taking three antihypertensive drugs. Which specific class of antihypertensive medication must be included in this regimen for the diagnosis to apply?

A. Calcium channel blocker

B. Beta-blocker

C. Alpha blocker

D. Diuretic

Correct answer: D

Diuretic Resistant hypertension is defined as blood pressure that remains above the target goal despite the concurrent use of three antihypertensive agents from different classes, taken at optimal doses. A crucial part of this definition is that one of the three agents must be a diuretic. Many cases of difficult-to-control hypertension are driven by volume expansion, making diuretics a cornerstone of therapy. Therefore, a patient cannot be diagnosed with true resistant hypertension unless their regimen includes a diuretic (typically a thiazide-like diuretic like chlorthalidone) and they are still not at goal. If a patient is on three non-diuretic medications, the first step is to add a diuretic before labeling them as resistant. This ensures that a major contributing factor (volume overload) has been addressed before proceeding to more complex investigations or fourth-line agents.

Question 33. In a 35-year-old woman with class II pulmonary hypertension who shows a negative response on vasoreactivity testing, what is the next management step?

A. lloprost

B. Ambrisentan

C. Nifedipine

D. Epoprostenol

Correct answer: B

Ambrisentan The management of pulmonary arterial hypertension (PAH) is guided by vasoreactivity testing. A small subset of patients who show a positive response (a significant drop in pulmonary artery pressure) to inhaled nitric oxide during right heart catheterization are candidates for treatment with high-dose calcium channel blockers like nifedipine (C). However, this patient had a negative vasoreactive test, meaning she is not a candidate for calcium channel blocker therapy. For patients with WHO Functional Class II symptoms who are vasoreactivity-negative, the guidelines recommend initiating therapy with an approved PAH-specific agent. The first-line options for Class II patients typically include oral medications like an endothelin receptor antagonist (ERA), such as ambrisentan or bosentan, or a phosphodiesterase-5 (PDE-5) inhibitor, such as sildenafil. Prostacyclin analogues like iloprost (A)

and epoprostenol (D) are generally reserved for more severe disease (Functional Class III or IV).

Question 34. Which medication is considered the treatment of choice for primary progressive multiple sclerosis (PPMS)?

A. Natalizumab

B. Ocrelizumab

C. Fingolimod

D. Alemtuzumab

Correct answer: B

Ocrelizumab Primary progressive multiple sclerosis (PPMS) is a form of MS characterized by a steady worsening of neurological function from the onset, without distinct relapses or remissions. For many years, there were no approved treatments that could slow the progression of PPMS. This changed with the approval of ocrelizumab. Ocrelizumab is a monoclonal antibody that targets and depletes CD20-positive B-lymphocytes. In its pivotal clinical trial (ORATORIO), ocrelizumab was the first and, to date, the only disease-modifying therapy to demonstrate a significant reduction in the progression of clinical disability in patients with PPMS. The other medications listed—natalizumab (A), fingolimod (C), and alemtuzumab (D)—are highly effective treatments for relapsing-remitting multiple sclerosis (RRMS) but have not shown efficacy in treating PPMS. Therefore, ocrelizumab is the preferred and only approved choice for managing this specific form of the disease.

Question 35. Which of the following statements about the selection of essential drugs is not correct?

A. An adequate safety profile needs to be established

B. Cost to benefit has to be considered

C. Fixed drug combination is preferred over single drugs

D. Disease prevalence is considered

Correct answer: C

Fixed drug combination is preferred over single drugs The World Health Organization's concept of an essential medicines list is based on several key principles for selecting drugs that should be available in a health system at all times. The selection criteria include public health relevance, meaning the drug should address a condition with significant disease prevalence (D). The drug must have demonstrated efficacy and an adequate safety profile from clinical trials (A). The cost-to-benefit ratio (B) is also a major consideration to ensure affordability and accessibility. However, the statement that fixed-dose combinations (FDCs) are preferred over single drugs (C) is incorrect. The general principle is that most essential medicines should be formulated as single compounds. FDCs are only included if they have a proven advantage in terms of therapeutic effect, safety, adherence, or reducing drug resistance (e.g., in TB or HIV treatment). They are the exception, not the preferred rule.

Question 36. What adjustment should be made to a patient’s retigabine regimen when phenytoin is added to their epilepsy treatment?

A. Increase the dose

B. Decrease the dose

C. Stop the drug

D. Stop retigabine and start on carbamazepine

Correct answer: A

Increase the dose This question involves a drug-drug interaction based on hepatic enzyme metabolism. Retigabine (also known as ezogabine) is an antiepileptic drug that is primarily metabolized in the liver, partly through glucuronidation by UGT enzymes. Phenytoin is a classic and potent inducer of hepatic microsomal enzymes, including various cytochrome P450 isoforms and UGT enzymes. When an enzyme-inducing drug like phenytoin is added to a patient's regimen, it will accelerate the metabolism of other drugs that are substrates for those enzymes. This leads to a faster clearance and lower plasma concentration of the affected drug. In this case, phenytoin will induce the metabolism of retigabine, leading to lower-than-expected blood levels and potentially a loss of seizure control. Therefore, to maintain a therapeutic effect, it is necessary to increase the dose of retigabine to compensate for its accelerated clearance.

Question 37. What might explain why clopidogrel failed to work in a patient who suffered a second stroke six months after starting the medication?

A. Downregulation of CYP2C19

B. Upregulation of CYP2C19

C. Upregulation of CYP1A1

D. Downregulation of CYP2E1

Correct answer: A

Downregulation of CYP2C19 Clopidogrel is an antiplatelet agent that functions as a prodrug, meaning it must be converted into its active metabolite to exert its therapeutic effect. This two-step bioactivation process occurs in the liver and is primarily mediated by the cytochrome P450 enzyme, CYP2C19. Some individuals possess genetic polymorphisms in the CYP2C19 gene that result in a reduced-function or non-functional enzyme. These individuals are known as "poor metabolizers." In such patients, the conversion of clopidogrel to its active form is significantly impaired, which can be described as a functional downregulation of CYP2C19 activity. This leads to lower plasma levels of the active metabolite, resulting in an inadequate antiplatelet response and a higher risk of major adverse cardiovascular and cerebrovascular events, such as stroke or stent thrombosis, despite adherence to standard dosing. Upregulation of the enzyme (B) would lead to an enhanced effect, while the other enzymes listed are not the primary activators of clopidogrel.

Question 38. Which of the following options is not correctly matched?

A. Adexanet alfa: Edoxaban

B. Andexanet alfa: Rivaroxaban

C. Idarucizumab: Dabigatran

D. Ciraparantag: Fondaparinux

Correct answer: D

Ciraparantag: Fondaparinux (A) Andexanet alfa – Edoxaban : Andexanet alfa is a recombinant modified factor Xa protein that acts as a decoy receptor for factor Xa inhibitors. It reverses the anticoagulant effects of direct factor Xa inhibitors such as rivaroxaban, apixaban, and edoxaban. Therefore, this match is correct. (B) Andexanet alfa – Rivaroxaban : Rivaroxaban is a direct factor Xa inhibitor, and andexanet alfa is specifically approved to reverse its anticoagulant effect. This match is also correct. (C) Idarucizumab – Dabigatran : Idarucizumab is a monoclonal antibody fragment that specifically binds to dabigatran, a direct thrombin inhibitor, and rapidly neutralizes its effect. This pairing is correct. (D) Ciraparantag – Fondaparinux : Ciraparantag (PER977) is an investigational broad-spectrum reversal agent designed to reverse multiple anticoagulants, including heparins and direct oral anticoagulants. However, it is not an established, approved specific reversal agent for fondaparinux. Therefore, this match is not correctly established.

Question 39. Nivolumab is used as a checkpoint inhibitor in which of the following conditions?

A. Retinoblastoma

B. Medulloblastoma

C. Pleuropulmonary Blastoma

D. Hodgkin's lymphoma

Correct answer: D

Hodgkin's lymphoma Nivolumab is an immune checkpoint inhibitor, a type of immunotherapy that works by blocking the programmed death-1 (PD-1) receptor on T-cells. This action prevents cancer cells from inactivating the T-cells, thereby unleashing the body's own immune system to attack the tumor. Nivolumab has been approved for the treatment of a variety of cancers. One of its key and highly effective indications is for classical Hodgkin's lymphoma that has relapsed or progressed after other treatments, such as chemotherapy and stem cell transplant. The malignant Reed-Sternberg cells in Hodgkin's lymphoma frequently exhibit genetic alterations that lead to the overexpression of the PD-1 ligands (PD-L1 and PD-L2), which makes this cancer particularly vulnerable to PD-1 blockade. Nivolumab is not a standard therapy for the other pediatric malignancies listed, such as retinoblastoma (A), medulloblastoma (B), or pleuropulmonary blastoma (C).

Question 40. Which of the following conditions does not involve the use of antimicrobial combinations?

A. Uncomplicated Gonorrhea

B. Tuberculosis

C. Intra-abdominal infections

D. Malaria

Correct answer: A

Uncomplicated Gonorrhea The use of combination antimicrobial therapy is standard practice for several conditions to enhance efficacy and prevent resistance. Tuberculosis (B) is the classic example, where a multi-drug regimen (e.g., RIPE) is mandatory to prevent the emergence of resistant strains. Malaria (D), particularly P. falciparum, is treated with Artemisinin-based Combination Therapy (ACT). Intra-abdominal infections (C) are typically polymicrobial, involving both aerobic and anaerobic bacteria, thus requiring broad-spectrum combination therapy. For many years, uncomplicated gonorrhea was treated with dual therapy (ceftriaxone plus azithromycin). However, due to rising azithromycin resistance and to promote antimicrobial stewardship, recent guidelines (e.g., CDC 2021) have shifted. The current primary recommendation for uncomplicated urogenital gonorrhea is monotherapy with a single higher dose of ceftriaxone, provided that co-infection with Chlamydia has been excluded. This makes gonorrhea the condition among the choices where combination therapy is not always required.

Question 41. If the dose of a drug that follows first-order kinetics is doubled, what happens to its half-life and plasma concentration?

A. Half-life doubles and plasma concentration remains the same

B. Half-life remains the same and plasma concentration doubles

C. Half-life and plasma concentration remain the same

D. Half-life and plasma concentration both double

Correct answer: B

Half-life remains the same and plasma concentration doubles This question assesses a fundamental concept in pharmacokinetics. For a drug that follows first-order kinetics, a constant fraction of the drug is eliminated per unit of time. A key characteristic of this process is that the elimination half-life (t1/2) is constant and is independent of the drug's plasma concentration or the dose administered. Therefore, doubling the dose will have no effect on the half-life. The steady-state plasma concentration (Css), on the other hand, is directly proportional to the dosing rate. If the dose is doubled while the dosing interval remains the same, the dosing rate is effectively doubled. Consequently, the average steady-state plasma concentration will also double. Thus, the correct answer is that the half-life remains the same while the plasma concentration doubles. This linear relationship between dose and concentration is the defining feature of first-order kinetics.

Question 42. A patient on phenytoin for seizures is also prescribed sucralfate four times daily for peptic ulcers. To prevent drug interaction and allow proper

absorption of both medications, what is the minimum time gap that should be maintained between administering phenytoin and sucralfate?

A. 30 minutes

B. 60 minutes

C. 90 minutes

D. 120 minutes

Correct answer: D

120 minutes Sucralfate is a medication used to treat ulcers by forming a protective, viscous barrier over the ulcerated surface in the stomach and duodenum. This physical coating, while beneficial for ulcer healing, can also interfere with the absorption of other orally administered medications by binding to them or preventing them from coming into contact with the gastrointestinal mucosa. Phenytoin is an anticonvulsant with a narrow therapeutic index, and its absorption is known to be significantly reduced when taken concurrently with sucralfate, potentially leading to subtherapeutic levels and loss of seizure control. To prevent this pharmacokinetic interaction, it is a standard recommendation to separate the administration of the two drugs. Other medications should be taken at least 2 hours (120 minutes) before or after taking sucralfate. This time interval allows for the adequate absorption of the other drug before the GI tract is coated by the sucralfate.

Question 43. How does remdesivir work in terms of its mechanism of action?

A. RNA-dependent DNA polymerase inhibition

B. RNA-dependent RNA polymerase inhibition NODIA MEDINK

C. Fusion inhibition

D. Entry inhibition

Correct answer: B

RNA-dependent RNA polymerase inhibition Remdesivir is a nucleotide analogue prodrug that is converted inside the cell into its active triphosphate form. This active metabolite mimics adenosine triphosphate (ATP) and competes for incorporation into viral RNA. RNA viruses such as SARS-CoV-2 replicate using the enzyme RNA-dependent RNA polymerase (RdRp). When remdesivir triphosphate is incorporated into the growing viral RNA strand by RdRp, it causes premature termination of RNA synthesis. This halts viral genome replication and reduces viral proliferation. Option (A) refers to RNA-dependent DNA polymerase (reverse transcriptase), which is used by retroviruses like HIV. Remdesivir does not act on reverse transcriptase. Options (C) and (D) involve blocking viral entry or fusion, which is not remdesivir’s mechanism. Therefore, remdesivir works by inhibiting RNA-dependent RNA polymerase, making option (B) correct.

Question 44. Which drug, when given concurrently, would increase the bioavailability of saquinavir?

A. Ritonavir

B. Vitamin C

C. Cimetidine

D. Ganciclovir

Correct answer: A

Ritonavir This is a duplicate of a question from the November 2021 paper. Saquinavir is an HIV protease inhibitor that is extensively metabolized by the cytochrome P450 enzyme CYP3A4, resulting in poor oral bioavailability. Ritonavir, another protease inhibitor, is a potent inhibitor of CYP3A4. This property is utilized in HIV therapy by co-administering a low dose of ritonavir with other protease inhibitors like saquinavir. This practice is known as "pharmacokinetic boosting." The ritonavir effectively shuts down the metabolic pathway for saquinavir, leading to a substantial increase in its plasma concentration and duration of action, thereby enhancing its antiviral activity and allowing for lower or less frequent dosing. This boosting strategy is a fundamental concept in modern antiretroviral therapy. The other options do not have this potent and specific interaction.

Question 45. How does cyclosporine exert its mechanism of action?

A. Inhibition of calcineurin

B. AMP kinase stimulation

C. IMP dehydrogenase inhibition

D. Dihydro-orotate dehydrogenase inhibition

Correct answer: A

Inhibition of calcineurin This is a duplicate of a question from the November 2021 paper. Cyclosporine is a potent calcineurin inhibitor used as an immunosuppressant to prevent organ transplant rejection and treat autoimmune diseases. Inside a T-cell, cyclosporine binds to its intracellular receptor, cyclophilin. The resulting cyclosporine-cyclophilin complex then binds to and inhibits calcineurin, a calcium-dependent phosphatase enzyme. The primary substrate of calcineurin is the Nuclear Factor of Activated T-cells (NFAT). By inhibiting calcineurin, cyclosporine prevents the dephosphorylation of NFAT. The phosphorylated NFAT cannot enter the nucleus, which in turn prevents the transcription of the gene for Interleukin-2 (IL-2). Since IL-2 is the main cytokine responsible for T-cell proliferation and activation, its suppression effectively halts the T-cell mediated immune response. This targeted action on T-cell activation is the basis of cyclosporine's powerful immunosuppressive effects.

Question 46. Which of the following options refers to a newly developed, innovative medication specifically intended for the treatment of depression?

A. Lurasidone

B. Vilazodone

C. Asenapine

D. Blonanserin

Correct answer: B

Vilazodone Vilazodone is an antidepressant with a novel dual mechanism of action, classifying it as a Serotonin Partial Agonist/Reuptake Inhibitor (SPARI). It combines the mechanism of a conventional selective serotonin reuptake inhibitor (SSRI) with partial agonism at the 5-HT1A serotonin receptor. This innovative approach is intended to provide effective antidepressant action while potentially mitigating some of the side effects associated with traditional SSRIs, such as sexual dysfunction. In contrast, lurasidone (A), asenapine (C), and blonanserin (D) are all classified as atypical antipsychotics. While some antipsychotics are used as adjuncts in treating depression or for bipolar depression, vilazodone was specifically designed and is primarily used as a novel monotherapy for major depressive disorder.

Question 47. Which drug listed in the options is the most effective for assisting with smoking cessation?

A. Varenicline

B. Buspirone SR

C. Nicotine gum

D. Rimonabant

Correct answer: A

Varenicline This is a duplicate of a question from the November 2021 paper. Among the available first-line pharmacological treatments for smoking cessation, varenicline is consistently shown in clinical trials to be the most effective. It acts as a partial agonist at the α 4 β 2 nicotinic acetylcholine receptor, the primary receptor mediating nicotine dependence. Its partial agonist activity provides a dual benefit : it mimics the effect of nicotine to a small degree, which helps to alleviate withdrawal symptoms and cravings (agonist effect), while simultaneously blocking nicotine from cigarettes from binding to and activating the receptor, which reduces the rewarding sensation of smoking (antagonist effect). This mechanism makes it more effective than nicotine replacement therapies like nicotine gum (C) or the antidepressant bupropion. Buspirone (B) is an anxiolytic and is not used for this purpose. Rimonabant (D) was removed from the market due to safety concerns. FORENSIC MEDICINE

Question 48. Match the postmortem pons with their corresponding types of injuries. a. Axe 1. Incised wound b. RTA 2. Tram track bruise c. Blade 3. Grazed abrasion d. Lathi 4. Chop wound

A. a-4, b-3, c-1, d-2

B. a-1, b-3, c-4, d-2

C. a-1, b-2, c-4, d-3

D. a-4, b-1, c-3, d-2

Correct answer: A

a-4, b-3, c-1, d-2 a. Axe : An axe has a heavy head and a sharp cutting edge. It inflicts an injury by chopping, combining the features of both a sharp and a blunt weapon. The resulting injury is a chop wound (4), which is an incised wound with underlying bone fracture or comminution. b. RTA (Road Traffic Accident) : In an RTA, a person may be dragged along the road surface, causing a frictional injury where the superficial layers of the skin are scraped off. This is a grazed abrasion (3). c. Blade : A sharp-edged weapon like a knife or razor blade produces a clean cut with sharp margins, where the length of the wound on the surface is greater than its depth. This is an incised wound (1). d. Lathi : A lathi is a long, heavy stick or baton, which is a classic blunt weapon. An impact with a cylindrical object like a lathi produces a characteristic patterned bruise, with two parallel lines of bruising and a pale area in the center. This is known as a tram track bruise (2).

Question 49. Match the following findings observed during postmortem examination with their corresponding time of appearance. a. Adipocere formation 1. 24 hrs b. Relaxation of urethral sphincter 2. 2-3 days c. Marbling of veins 3. 4-5 days d. Liquefaction of tissues 4. 8-10 days

A. a-4, b-1, c-2, d-3

B. a-3, b-1, c-2, d-4

C. a-4, b-2, c-1, d-3

D. a-1, b-2, c-3, d-4

Correct answer: A

a-4, b-1, c-2, d-3 Adipocere formation corresponds to 8–10 days (4). Adipocere, also called “grave wax,” results from the hydrolysis and hydrogenation of body fats in moist environments. It is a relatively late postmortem change and typically becomes evident after about a week or more, especially under warm and humid conditions. Relaxation of the urethral sphincter corresponds to 24 hours (1). Shortly after death, muscles lose tone due to cessation of ATP production. This leads to sphincter relaxation and possible passage of urine and feces. It occurs early in the postmortem period. Marbling of veins corresponds to 2–3 days (2). Marbling is caused by hemolysis and bacterial production of hydrogen sulfide, which reacts with hemoglobin to form greenish discoloration along superficial veins. It is an early sign of putrefaction. Liquefaction of tissues corresponds to 4–6 days (3). As decomposition progresses, enzymatic and bacterial activity cause softening and liquefaction of internal organs. Thus, the correct matching is a-4, b-1, c-2, d-3.

Question 50. In the context of a forensic examination following an alleged sexual assault, Barberio's test is performed on stains found on the victim’s clothing. Which specific substance does this test identify?

A. Spermine

B. Acid phosphatase

C. Choline

D. Fructose

Correct answer: A

Spermine In the forensic investigation of sexual assault, various tests are used to identify the presence of seminal fluid. Barberio's test is a specific microchemical or crystal test for the definitive identification of semen. The test relies on the detection of spermine, a polyamine that is present in very high concentrations in seminal fluid. The procedure involves adding a solution of picric acid to an extract of the suspected stain. If spermine is present, it will react with the picric acid to form characteristic, yellow, needle-shaped crystals of spermine picrate, which can be identified under a microscope. While other tests are used—the acid phosphatase test (B) is a presumptive screening test, and fructose (D) and choline (C) can also be tested for—the Barberio's test is specifically for the detection of spermine to confirm the presence of seminal fluid.

Question 51. A skull is found in a forest, and forensic experts examine it to assess whether it might belong to a female, corresponding to a girl reported missing 15 days earlier. Which skull characteristics would indicate a female origin? 1. Large frontal and parietal eminence 2. Heavy cheek bones 3. Less pronounced glabella 4. Square orbits 5. Small mastoid

A. 1 and 4 only

B. 2,3 and 4

C. 1,3 and 5

D. 3,4 and 5

Correct answer: C

1,3 and 5 The determination of sex from a skull is based on general differences in robusticity and specific morphological traits. Female skulls are typically more gracile (less robust) than male skulls. 1. Large frontal and parietal eminence : Prominent, bossed frontal and parietal eminences are characteristic features of a female skull, giving it a more rounded contour. 2. Heavy cheek bones : Robust, heavy zygomatic arches (cheek bones) are a male trait. 3. Less pronounced glabella : The glabella (the area between the eyebrows) and supraorbital ridges are smooth and less pronounced in females, whereas they are prominent in males. 4. Square orbits : The orbital margins in females are typically sharp and the shape is more rounded. Square or rectangular orbits with blunted margins are a male trait. 5. Small mastoid : The mastoid process, located behind the ear, is generally much larger and more prominent in males compared to the relatively small mastoid process found in females. Therefore, the combination of prominent eminences, a smooth glabella, and a small mastoid process suggests the skull is female.

Question 52. What findings are typically observed during the postmortem

examination of a 20-year-old man whose body was recovered from the sea, Click Here to Buy book on Amazon page 519 INICET Examination Paper

A. A

B. B

C. C

D. D

Correct answer: B

B In cystic fibrosis, the primary defect is in the CFTR chloride channel present in epithelial cells of exocrine glands. In the pancreas, this defect causes thick, viscid secretions that obstruct the small pancreatic ducts and ductules. The earliest and most characteristic pathological change is obstruction of the intercalated and intralobular ducts, followed by progressive damage to the surrounding exocrine acini. In the given histological image, label B represents the small pancreatic ducts/ductules located within the lobules. These ducts are lined by simple cuboidal epithelium and are responsible for carrying enzyme-rich secretions from acinar cells toward the main pancreatic duct. Because cystic fibrosis causes inspissated secretions that block these small ducts first, they become dilated and eventually lead to acinar atrophy and fibrosis. Over time, the exocrine pancreas is replaced by fibrofatty tissue. Therefore, the pancreatic structure primarily affected in cystic fibrosis is the ducts, corresponding to label B.

Question 53. What is the term for a situation in which, after consuming alcohol and arguing over a mutual romantic interest, one individual kills another by sitting on their chest and blocking their nose and mouth?

A. Burking

B. Smothering

C. Traumatic asphyxia

D. Overlaying

Correct answer: A

Burking Burking is a form of homicidal asphyxia in which the victim is killed by a combination of smothering and traumatic compression of the chest. Typically, the assailant sits on the victim’s chest to prevent respiratory movements while simultaneously covering the nose and mouth to block air entry. This dual mechanism causes rapid suffocation. The term originates from the 19th-century criminal William Burke, who murdered victims without leaving obvious external injuries, making detection difficult. Because burking produces minimal visible marks, it may initially appear as a natural death unless carefully examined. (B) Option Smothering refers only to obstruction of the external air passages (nose and mouth) without chest compression. (C) Option Traumatic asphyxia results from severe chest compression, usually accidental (e.g., crowd crush), not intentional airway blockage. (D) Option Overlaying refers to accidental smothering of an infant by a sleeping adult. Since the scenario describes chest compression

combined with blocking the nose and mouth, the correct term is Burking.

Question 54. If an employee working in a dye factory presents with nausea, vomiting, dark blood-tinged stools, conjunctivitis, and a burning sensation in the throat and stomach, which type of poisoning should be suspected?

A. Potassium permanganate

B. Arsenic

C. Thallium

D. Lead

Correct answer: B

Arsenic The patient's occupation in a dye factory provides a clue, as arsenic compounds have been used in the manufacturing of pigments and dyes. The clinical presentation of acute poisoning with severe gastrointestinal distress—including a burning sensation in the throat and stomach, nausea, vomiting, and bloody diarrhea ("rice-water stools" that can become bloody)—is the classic picture of acute arsenic poisoning. Arsenic is a potent gastrointestinal irritant that causes hemorrhagic gastroenteritis. The conjunctivitis is also a feature of arsenic exposure. Potassium permanganate (A) would cause brown staining and corrosion of the mucous membranes. Lead poisoning (D) typically presents with more chronic symptoms, such as abdominal colic, anemia, and neurological deficits (lead line, wrist drop). Thallium poisoning (C) is classically associated with alopecia (hair loss) and a painful peripheral neuropathy, which appear later. The acute, severe gastroenteritis strongly points to arsenic.

Question 55. During the autopsy of a person who died by hanging, a ligature mark was seen on the lower third of the neck, with the head leaning to the left, saliva dribbling from the left side of the mouth, the tongue protruding, both pupils dilated, and the right eye remaining open. Which anatomical structure is most likely being compressed, leading to the right eye staying open?

A. Right internal jugular vein

B. Cervical sympathetic chain

C. Left vagus nerve

D. Right internal carotid artery

Correct answer: B

Cervical sympathetic chain The finding of one eye remaining open (unilateral ptosis being absent) while the other may be closed suggests an issue with the innervation of the eyelid muscles. The upper eyelid is elevated by the levator palpebrae superioris (innervated by CN III) and the superior tarsal muscle (Muller's muscle), which is innervated by sympathetic fibers. These sympathetic fibers originate in the hypothalamus, descend through the brainstem, and synapse in the spinal cord before emerging and ascending in the cervical sympathetic chain, which runs along the neck. In a hanging, particularly an atypical hanging where the ligature is

low on the neck and the head is tilted, the sympathetic chain can be compressed or stretched. Unilateral damage to the sympathetic chain would result in an ipsilateral Horner's syndrome (ptosis, miosis, anhidrosis). The description implies that the left side may have ptosis (due to head tilt), while the right eye remains open, suggesting the right cervical sympathetic chain is being irritated or is simply unaffected compared to the left. MICROBIOLOGY

Question 56. Which technique is used in molecular biology to detect the presence of RNA?

A. Sanger's method

B. G banding

C. Western blot

D. RT-PCR

Correct answer: D

RT-PCR This is a duplicate of a previous question. Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) is the specific and highly sensitive technique used for the detection and analysis of RNA. The process involves two main stages. The first is reverse transcription, where the enzyme reverse transcriptase synthesizes a single-stranded DNA molecule (complementary DNA or cDNA) from an RNA template. The second stage is the standard polymerase chain reaction (PCR), where the newly created cDNA is amplified exponentially to detectable levels. This method is fundamental for diagnosing RNA virus infections and is the standard for quantifying gene expression by measuring mRNA levels (as RT-qPCR). Sanger's method (A) is for DNA sequencing, G banding (B) is for karyotyping chromosomes, and Western blot (C) is for detecting proteins.

Question 57. What is the most accurate method for measuring glycated hemoglobin (HbA1c)?

A. Affinity chromatography

B. Ion exchange chromatography

C. Immunoassay

D. Electrophoresis

Correct answer: A

Affinity chromatography Glycated hemoglobin (HbA1c) reflects the average blood glucose level over the previous 2–3 months. It is formed by the non-enzymatic attachment of glucose to the N-terminal valine of the β -chain of hemoglobin A. Among the available laboratory methods, boronate affinity chromatography is considered one of the most accurate and reliable techniques for measuring HbA1c. This method works by specifically binding glycated hemoglobin to a boronate resin, which has an affinity for the cis-diol groups of glycated proteins. Because it measures total glycated hemoglobin rather than relying on charge differences, it is less affected by hemoglobin variants and many analytical interferences. Ion

exchange chromatography separates hemoglobin fractions based on charge differences, but it may be affected by hemoglobinopathies. Immunoassays use antibodies directed against HbA1c but can be influenced by structural variants. Electrophoresis is mainly used for detecting hemoglobin variants rather than precise HbA1c quantification. Therefore, affinity chromatography provides the most accurate and specific measurement of HbA1c.

Question 58. Determine the accurate combination of 'organism-drug' that exhibits intrinsic resistance.

A. Aspergillus niger - Voriconazole

B. Aspergillus fumigatus - Micafungin

C. Candida albicans - Amphotericin B

D. Candida krusei - Fluconazole

Correct answer: D

Candida krusei - Fluconazole Intrinsic resistance refers to a natural, inherent resistance of a microbial species to a particular antimicrobial drug, present in all or almost all isolates of that species. (A) Aspergillus niger is generally susceptible to voriconazole. (B) Aspergillus fumigatus is generally susceptible to echinocandins like micafungin. (C) Candida albicans is generally susceptible to amphotericin B; resistance is very rare. (D) Candida krusei is a classic example of a yeast species with intrinsic resistance. It is naturally and predictably resistant to fluconazole, a commonly used azole antifungal. This is due to a reduced affinity of the target enzyme, lanosterol 14-alpha-demethylase, for the drug. For this reason, if C. krusei is identified as the cause of an infection, fluconazole should not be used, and alternative agents like an echinocandin or amphotericin B are required.

Question 59. In the formalin–ether sedimentation method for stool sample collection, the processed specimen is separated into layers labeled A, B, C, and D. At which specific level are parasitic ova typically seen during microscopic examination? NODIA MEDINK

A. Life expectancy at birth, literacy and standard of living

B. Life expectancy at 1 year, literacy and standard of living

C. Infant mortality rate, literacy and standard of living

D. Life expectancy at 1 year, literacy and infant mortality rate

Correct answer: A

Life expectancy at birth, literacy and standard of living The Human Development Index (HDI) is a composite statistic developed by the United Nations Development Programme (UNDP), not the WHO, to rank countries into tiers of human development. The HDI is based on three key dimensions of human development : A long and healthy life : This is measured by life expectancy at birth. Knowledge : This is measured by a combination of the mean years of schooling for adults aged 25 years and older and the expected years of schooling for children of

school-entering age. This dimension is broadly captured by the term literacy or education. A decent standard of living : This is measured by the Gross National Income (GNI) per capita, adjusted for purchasing power parity. Therefore, the three core components are life expectancy at birth, education (literacy), and standard of living (income).

Question 60. Which of the following methods is used for xenodiagnosis?

A. Rabbit ileal loop for enterotoxigenic Escherichia coli

B. Injecting Aedes thorax with blood of a suspected dengue patient

C. Injecting a hamster with splenic biopsy for diagnosis of leishmaniasis

D. Intradermal test on guinea pigs for toxigenicity of Corynebacterium diphtheriae

Correct answer: C

Injecting a hamster with splenic biopsy for diagnosis of leishmaniasis Xenodiagnosis is a diagnostic method in which material from a suspected patient is inoculated into a living susceptible animal or vector, and the animal is later examined for development of the infection. It is used when direct detection in humans is difficult. In visceral leishmaniasis (kala-azar), organisms may be scanty in human samples. Injecting splenic aspirate or biopsy material into a hamster (a susceptible laboratory animal) allows the parasite to multiply, after which it can be detected in the animal's tissues. This is a classical example of xenodiagnosis. (A) Option rabbit ileal loop is an experimental model to demonstrate enterotoxin activity, not xenodiagnosis. (B) Option injecting Aedes thorax is a laboratory technique for viral isolation, not true xenodiagnosis. (D) Option guinea pig intradermal test assesses toxin production, not diagnosis via living host amplification. Thus, xenodiagnosis involves using a live animal to detect infection, making (C) correct.

Question 61. Match the items in the life cycle of the Japanese encephalitis virus with their corresponding roles: a. Accidental host 1. Ardeid birds b. Amplifier 2. Culex c. Reservoir 3. Human d. Vector 4. Pigs

A. 1-d, 2-c, 3-a, 4-b

B. 1-d, 2-c, 3-b, 4-a

C. 1-c, 2-d, 3-a, 4-b

D. 1-c, 2-d, 3-b, 4-a

Correct answer: C

1-c, 2-d, 3-a, 4-b The life cycle of the Japanese Encephalitis (JE) virus involves several key players. 4. Vector : The virus is transmitted between hosts by the bite of a mosquito, primarily species of the Culex genus, making the mosquito the vector (4-b). 3. Reservoir : The natural reservoirs for the virus are wading birds, such as Ardeid birds (e.g., herons and egrets). The virus circulates between these birds and mosquitoes without causing significant disease in the birds (3-a). 2. Amplifier : Pigs act as crucial amplifying hosts. They develop a very high level of viremia when infected, which efficiently infects a large number of mosquitoes, thus amplifying

the amount of virus in the environment (2-d). 1. Accidental host : Humans (and horses) are considered accidental or dead-end hosts. They can become infected and develop severe disease, but the level of viremia in their blood is too low to effectively transmit the virus back to feeding mosquitoes, so they do not play a role in maintaining the transmission cycle (1-c).

Question 62. Which antigen is present in the Hepatitis B subunit vaccine?

A. HbeAg

B. HbsAg

C. HbcAg

D. HBV DNA

Correct answer: B

HbsAg The Hepatitis B vaccine is a classic example of a recombinant subunit vaccine. It is produced using genetic engineering technology. The gene that codes for the Hepatitis B surface antigen (HBsAg) is inserted into yeast cells (such as Saccharomyces cerevisiae). These yeast cells are then cultured, and they produce large quantities of the HBsAg protein. This protein is then harvested, purified, and formulated with an adjuvant (like alum) to create the vaccine. When injected, this purified HBsAg is recognized as foreign by the immune system, which then produces protective antibodies (anti-HBs) against it. These antibodies provide immunity against future infection with the live Hepatitis B virus. The vaccine does not contain the e-antigen (HBeAg), the core antigen (HBcAg), or any viral genetic material (HBV DNA).

Question 63. Please match the following eggs with their corresponding organisms. Click Here to Buy book on Amazon MEDINK (C) Hodgkin's lymphoma, RS cell, EBV (D) Infectious mononucleosis, Reed-Sternberg cell, CMV

A. Hymenolepis nana

B. Ascaris lumbricoides

C. Ancylostoma duodenale

D. Taenia solium

Correct answer: C

Hodgkin's lymphoma, RS cell, EBV The histopathological image shows a very large, malignant cell with two large, mirror-image nuclei, each containing a prominent eosinophilic nucleolus. This gives the cell a characteristic "owl's eye" appearance. This is the classic morphology of a diagnostic Reed-Sternberg (RS) cell. The presence of RS cells within an appropriate inflammatory background is the defining feature of Hodgkin's lymphoma. Hodgkin's lymphoma is a malignancy of B-lymphocyte origin that frequently presents with cervical lymphadenopathy. A significant proportion of cases, particularly the mixed cellularity subtype which is common in children, are associated with the Epstein-Barr virus (EBV), the DNA of which can be found within the RS cells. Non-Hodgkin's lymphoma (A) has a different histology and lacks classic RS cells.

Question 64. In the context of milk pasteurization, which test is not associated with evaluating the process?

A. Phosphatase test

B. Iodine test

C. Standard plate count

D. Methylene blue reduction test

Correct answer: B

Iodine test Several tests are used to ensure the safety and quality of pasteurized milk. Phosphatase test (A) : This is the key test to verify the adequacy of pasteurization. The enzyme alkaline phosphatase is naturally present in milk and is destroyed at a temperature just slightly above that required for pasteurization. Therefore, the absence of this enzyme indicates that pasteurization was successful. (C) Standard plate count : This test measures the total number of viable bacteria remaining in the milk after pasteurization to ensure it meets public health standards. (D) Methylene blue reduction test : This is another test for microbial quality. Methylene blue is a dye that is decolorized by bacterial metabolism. The time it takes for the blue color to disappear is inversely proportional to the bacterial load. (B) Iodine test : This test is used to detect the presence of starch. It has no role in testing the quality or safety of milk. PSM

Question 65. 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

Evaluation of control program The SAFE strategy is a comprehensive public health strategy endorsed by the World Health Organization for the global elimination of trachoma, the leading infectious cause of blindness. The acronym SAFE stands for the four key components of the intervention : S Surgery for trichiasis (A), the late, blinding stage of the disease where eyelashes turn inward and abrade the cornea. A Antibiotics (B), specifically azithromycin, used to treat active infection with Chlamydia trachomatis and reduce the community reservoir of the organism. F Facial cleanliness (C), a behavioral intervention to reduce transmission, especially among children. E Environmental improvement, which includes increasing access to clean water and improving sanitation to reduce the fly population that transmits the disease. Evaluation (D) is a critical part of any public health program to monitor its progress and impact, but it is not one of the four intervention components represented by the SAFE acronym itself.

Question 66. Select the correct option regarding Mobile Medical Units (MMUs). 1.

MMUs are run by the government 2. MMUs are operated by external organizations, receiving medical resources provided by the government. 3. MMUs are run by the government, and medical supplies are also given by the government. 4. External agencies oversee the management of MMUs and are responsible for providing medical supplies as well.

A. Only 1

B. 1 and 2

C. 1, 2, and 3

D. 1, 2, 3, and 4

Correct answer: C

1, 2, and 3 Mobile Medical Units (MMUs) are part of public health outreach services designed to deliver healthcare to remote, rural, tribal, and underserved populations. They function under government health programs such as the National Health Mission (NHM). 1. Statement 1 is correct because MMUs are government initiatives and are funded by the government. 2. Statement 2 is also correct. In many states, MMUs are operated through Public–Private Partnership (PPP) models. External organizations or NGOs may manage daily operations, but they function under government supervision and guidelines. 3. Statement 3 is correct because the government provides the essential medical supplies, medicines, equipment, and funding required for MMU functioning, even when operations are outsourced. 4. Statement 4 is incorrect because although external agencies may manage operations, they are not independently responsible for providing medical supplies. The supplies and financial support primarily come from the government. Thus, MMUs may be government-run directly or operated by external agencies under government support, but medical resources are government-provided. Therefore, the correct combination is 1, 2, and 3.

Question 67. While organizing hypertension management services at a Primary Health Center (PHC), you have 50 patients on antihypertensive therapy—40 taking amlodipine 5 mg daily and 10 taking lisinopril 10 mg daily. How many tablets are required for one month, and what would be a suitable reorder factor (RF) to ensure sufficient stock?

A. 1000, RF=3

B. 1200, RF=2

C. 1400, RF=3

D. 1500, RF=2

Correct answer: D

1500, RF=2 First, let's calculate the total number of tablets needed for one month (assuming 30 days). Amlodipine : 40 patients × 1 tablet/day × 30 days = 1200 tablets. Lisinopril : 10 patients × 1 tablet/day × 30 days = 300 tablets. Total tablets per month = 1200 + 300 = 1500 tablets.

Next, we need to determine the reorder factor. The reorder level is the stock level at which a new order should be placed. It is calculated as : Maximum consumption × Maximum lead time. A simplified approach often uses a reorder factor (or buffer stock). A reorder factor (RF) of 2 would mean maintaining a buffer stock equivalent to one month's consumption, ordering when stock falls to this level. An RF of 3 would mean a two-month buffer. A standard reorder factor for a PHC is often 2, which ensures a one-month reserve. Therefore, the total number of tablets needed is 1500, and a reasonable reorder factor is 2.

Question 68. During exercise, the body’s oxygen consumption stabilizes at 1500 ml/min. Given that the baseline oxygen consumption is 250 ml/min, what is the resulting MET (Metabolic Equivalent of Task) score?

A. 5

B. 6

C. 1/5

D. 1/6

Correct answer: B

6 The Metabolic Equivalent of Task (MET) is a unit used to express the energy cost of physical activities. By definition, 1 MET is equivalent to the energy expenditure of sitting quietly, which corresponds to a baseline oxygen consumption rate of approximately 3.5 mL of oxygen per kilogram of body weight per minute. For an average 70 kg person, this equates to a total resting oxygen consumption of 3.5 × 70 = 245 mL/min, which is given in the problem as a baseline of 250 mL/min. The MET score of an activity is calculated by dividing the oxygen consumption during the activity by the baseline oxygen consumption. Oxygen consumption during exercise = 1500 mL/min Baseline oxygen consumption = 250 mL/min MET score = (1500 mL/min) / (250 mL/min) = 6. Therefore, the activity has an energy expenditure that is six times the resting metabolic rate.

Question 69. Several new vaccines are currently under development, and their efficacy results are shown in the provided image. Which of these newly developed vaccines exhibit effectiveness similar to that of the earlier vaccine? Click Here to Buy book on Amazon page 523 INICET Examination Paper suggesting that the cause of death was seawater drowning? 1. Hypernatremia 2. Hyponatremia 3. Hyperkalemia 4. Myocardial anoxia 5. Hemodilution

A. 1 and 3

B. 1 and 4

C. 2,3 and 5

D. 2,4 and 5

Correct answer: B

1 and 4 The pathophysiology of drowning differs significantly between fresh water and salt

water. Seawater is hypertonic compared to human plasma. When a person drowns in the sea, the hypertonic saltwater is aspirated into the alveoli. Due to the osmotic gradient, fluid is drawn from the pulmonary circulation into the alveoli, leading to rapid and severe pulmonary edema. Concurrently, electrolytes, particularly sodium, diffuse from the inhaled seawater into the bloodstream, causing hypernatremia (1) and hemoconcentration (the opposite of hemodilution, 5). The entire process of drowning leads to asphyxia, which results in severe systemic hypoxia and myocardial anoxia (4), ultimately causing cardiac arrest. Hyperkalemia (3) can occur due to acidosis and cellular breakdown but is not as specific as the hypernatremia. Hyponatremia (2) and hemodilution (5) are characteristic findings in freshwater drowning, not saltwater drowning.

Question 70. When the surrounding temperature reaches 47°C, which mechanism becomes the main way the body loses heat?

A. Radiation

B. Conduction

C. Convection

D. Sweating

Correct answer: D

Sweating The human body dissipates heat through four main mechanisms : radiation, conduction, convection, and evaporation. Radiation (A), conduction (B), and convection (C) are all processes that depend on a temperature gradient; heat flows from a warmer object to a cooler one. When the ambient environmental temperature is higher than the body's skin temperature (which is typically around 33-35°C), these three mechanisms no longer work to cool the body. In fact, the body will gain heat from the environment through these processes. In this situation, the only effective mechanism for heat dissipation is the evaporation of sweat. The process of converting liquid sweat into water vapor on the skin's surface requires a significant amount of energy (the latent heat of vaporization), which is drawn from the body, thereby cooling it down. Therefore, at an ambient temperature of 47°C, sweating and subsequent evaporation is the sole physiological means of losing heat.

Question 71. In industrial environments, what is the main route through which inorganic lead is absorbed, leading to lead poisoning?

A. Absorption through skin

B. Inhaled lead dust

C. Ingestion of contaminated food and water

D. Contaminated hands

Correct answer: B

Inhaled lead dust While lead poisoning can occur through ingestion, the primary and most significant route of exposure in occupational or industrial settings is the inhalation of lead-containing dust and fumes. Industrial processes such as lead smelting, battery

manufacturing and recycling, and the removal of lead-based paint can generate fine airborne particles of inorganic lead. These particles are readily inhaled and deposited in the lungs, where they are efficiently absorbed into the bloodstream. The absorption of lead via the respiratory tract is much more efficient (around 30-50%) compared to the gastrointestinal tract (around 10% in adults). While ingestion via contaminated hands (D), food, or water (C) also contributes, inhalation is the dominant route for high-level occupational exposure. Dermal absorption (A) of inorganic lead is generally considered negligible.

Question 72. What is a true statement about nicotine substitution therapy?

A. Preferably given by gastrointestinal route.

B. Varenicline comes with a black box warning of cardiovascular death.

C. There should be a 15-minute gap between nicotine gum and coffee/soda/acidic food as they decrease its absorption.

D. Nicotine chewing gum is better for constant use as it gives 25% higher blood level than lozenges.

Correct answer: C

There should be a 15-minute gap between nicotine gum and coffee/soda/acidic food as they decrease its absorption. This statement is true. Nicotine from nicotine replacement therapy (NRT) products like nicotine gum and lozenges is absorbed through the buccal mucosa (the lining of the mouth). The absorption is pH-dependent and occurs best in an alkaline environment. Consuming acidic beverages such as coffee, juices, or soft drinks (soda) immediately before or during the use of nicotine gum can lower the pH in the mouth. This acidic environment causes the nicotine to become ionized, which significantly decreases its absorption through the buccal mucosa, rendering the therapy less effective. Therefore, it is a standard recommendation to advise patients to avoid eating or drinking for 15 minutes before and during the use of nicotine gum or lozenges. The other statements are incorrect : Varenicline's black box warning was for neuropsychiatric events (and has since been updated), and nicotine gum provides intermittent, not constant, dosing.

Question 73. Which of the following is used for graphical representation in flow cytometry analysis?

A. Bar diagram, dot plot

B. Line diagram, dot plot

C. Histogram, dot plot

D. Pie chart, dot plot

Correct answer: C

Histogram, dot plot Flow cytometry is a powerful technique that analyzes the physical and chemical characteristics of individual cells as they pass through a laser beam. The data generated is complex and is typically visualized using specific types of graphs. The two most

common graphical representations are the histogram and the dot plot. A histogram is a one-dimensional graph that displays the distribution of a single parameter (e.g., the intensity of a single fluorescent marker or cell size) across a population of cells. The x-axis represents the parameter's intensity, and the y-axis represents the number of cells (count). A dot plot (or scatter plot) is a two-dimensional graph where each dot represents a single cell. It is used to simultaneously visualize two different parameters, one on the x-axis and one on the y-axis (e.g., CD3 vs. CD4 fluorescence), allowing for the identification and quantification of cell subpopulations.

Question 74. Which of the options below does not constitute a component of case-control studies?

A. Follow up

B. Matching

C. Strength of association

D. Selection of study subjects

Correct answer: A

Follow up A case-control study is a type of observational study design that is retrospective in nature. It begins by identifying a group of individuals with a particular disease or outcome (the "cases") and a comparable group without the disease (the "controls"). The study then looks back in time to compare the frequency of past exposure to a potential risk factor between the two groups. Key components include the careful selection of study subjects (D) to ensure cases and controls are appropriately defined, often using matching (B) to control for confounding variables, and calculating a measure of the strength of association (C), which is the odds ratio. A defining feature of this design is that it starts with the outcome and looks backward. It does not involve a period of follow-up over time to observe the development of disease, which is the characteristic feature of a cohort study.

Question 75. Which statement correctly describes how the prevalence and incidence of a disease will be affected when a newly introduced drug reduces mortality but does not provide a cure?

A. Decrease in incidence

B. Decrease in prevalence

C. Increase in incidence

D. Increase in prevalence

Correct answer: D

Increase in prevalence This question tests the relationship between incidence, prevalence, and disease duration. Incidence is the rate of new cases of a disease in a population over a specific period. The new drug does not prevent the disease, so it will not affect the incidence. Prevalence is the proportion of a population that has a disease at a specific point in time.

Prevalence is influenced by both the incidence rate and the duration of the disease (Prevalence ≈ Incidence × Duration). The newly introduced drug reduces mortality, which means that people with the disease live longer. Since the drug does not cure the disease, these individuals remain in the "diseased" population for a longer period. This increase in the average duration of the disease, while the incidence remains the same, will lead to an increase in the total number of people living with the disease at any given time, thus causing an increase in prevalence.

Question 76. What is triage for?

A. To prepare for a disaster

B. To assess the impact of a disaster

C. To classify the priority of treatment

D. To rehabilitate following a disaster

Correct answer: C

To classify the priority of treatment Triage is the process of sorting and prioritizing patients based on the severity of their injuries or illness, especially in a mass casualty incident, disaster, or busy emergency department where the number of patients exceeds the available resources. The primary goal of triage is to classify the priority of treatment to ensure that medical care is directed to those who are most critically ill or injured and who have the greatest chance of survival with prompt intervention. Triage systems, such as START (Simple Triage and Rapid Treatment), use color codes (e.g., red for immediate, yellow for delayed, green for minor, black for deceased/expectant) to quickly categorize patients. It is a core component of the "response" phase of disaster management, not preparation (A), assessment (B), or rehabilitation (D).

Question 77. Which statement correctly explains how prevalence and incidence are affected when a new drug lowers mortality but does not cure the disease?

A. Decrease in incidence

B. Decrease in prevalence

C. Increase in incidence

D. Increase in prevalence

Correct answer: D

Increase in prevalence This is a duplicate of question 98. To reiterate the concept, incidence refers to the rate at which new cases of a disease occur. A treatment that does not prevent the disease will have no effect on incidence. Prevalence refers to the total number of existing cases at a point in time. The relationship can be approximated as Prevalence ≈ Incidence × Duration. The new drug, by reducing mortality, increases the survival time of patients with the disease. Since the drug does not provide a cure, these patients continue to live with the condition for a longer duration. This increase in the average duration of the illness, with an unchanged incidence rate, will necessarily lead to an accumulation of cases in the population. Therefore, the introduction of such a drug will cause the prevalence of the disease to increase. ENT

Question 78. What is the likely diagnosis for a patient experiencing vertigo, tinnitus, and head tilt, who had a myringoplasty for a safe type of chronic suppurative otitis media (CSOM) six months prior?

A. Perilymphatic fistula

B. Labyrinthitis

C. Paget disease

D. Vestibular schwannoma

Correct answer: A

Perilymphatic fistula The combination of vestibular symptoms (vertigo, head tilt) and auditory symptoms (tinnitus) developing after ear surgery is highly suggestive of an inner ear complication. A perilymphatic fistula is an abnormal opening between the fluid-filled inner ear (perilymph space) and the air-filled middle ear. Such a fistula can be a rare but serious complication of chronic otitis media or, as in this case, iatrogenic damage during middle ear surgery like myringoplasty. The leakage of perilymph or the transmission of pressure changes from the middle ear to the inner ear through the fistula can cause episodic vertigo, disequilibrium, and sensorineural hearing loss or tinnitus. Symptoms can often be exacerbated by activities that change middle ear or intracranial pressure (e.g., straining, coughing), known as the Tullio phenomenon. Labyrinthitis (B) is typically an acute, severe episode, while vestibular schwannoma (D) would not be related to the recent surgery.

Question 79. Which of the following methods is accurate for measuring the nasogastric tube?

A. Tip of nose to ear lobule to xiphisternum

B. Angle of mouth to tragus to xiphisternum

C. Ala of nose to angle of mandible to xiphisternum

D. Angle of mouth to ear lobule to umbilicus

Correct answer: A

Tip of nose to ear lobule to xiphisternum page 537 INICET Examination Paper 2. Uniplanar with a single rod 3. Uniplanar with double rod 4. Biplanar frame/Ring with a cylindrical rod (A) 1>2>3>4 (B) 2>4>3>1 (C) 1>4>3>2 (D) 2>3>1>4 AAns (C) 1>4>3>2 The stability of an external fixator construct is determined by its biomechanical properties, particularly its resistance to bending, axial, and torsional forces. The stability generally increases with the complexity of the frame. Most Stable : The Ilizarov fixator (1), a true circular frame with tensioned wires, provides multiplanar stability and is considered the most stable construct, offering excellent resistance to all deforming forces. Next is a hybrid frame or a biplanar frame (4), which uses pins inserted in two different planes, providing significantly more stability than a simple unilateral frame. A uniplanar frame with a double rod (3) is stiffer and more stable than one with a single rod. Least Stable : The simplest and least stable construct is a uniplanar frame

with a single connecting rod (2). Therefore, the correct ranking from most stable to least stable is Ilizarov > Biplanar > Uniplanar (double rod) > Uniplanar (single rod), which corresponds to the sequence 1 > 4 > 3 > 2. OBS & GYNE

Question 80. A 30-year-old woman presents with eye redness, pain, elevated intraocular pressure (38 mmHg), aqueous flare, and keratic precipitates. Which medication should she avoid in this condition?

A. Beta-blockers

B. Mannitol

C. Carbonic anhydrase inhibitors

D. Prostaglandin analogs

Correct answer: D

Prostaglandin analogs The patient's clinical presentation of eye pain, redness, aqueous flare (protein in the anterior chamber), and keratic precipitates (inflammatory cells on the corneal endothelium) is characteristic of acute anterior uveitis. The significantly elevated intraocular pressure (IOP) indicates a secondary inflammatory glaucoma, a common complication where inflammatory cells and fibrin obstruct the trabecular meshwork. The primary treatment for uveitis is to control the inflammation with corticosteroids. To manage the high IOP, aqueous suppressants like topical beta-blockers (A), carbonic anhydrase inhibitors (C), or systemic agents like mannitol (B) are used. However, prostaglandin analogs (e.g., latanoprost, travoprost) are contraindicated in the setting of active intraocular inflammation. Prostaglandins are themselves inflammatory mediators, and these drugs can worsen the breakdown of the blood-aqueous barrier, increase inflammation, and exacerbate the uveitis and associated cystoid macular edema.

Question 81. What is the primary mode of dissemination of retinoblastoma?

A. Optic nerve invasion

B. Hematogenous

C. Direct invasion

D. Lymphatic spread

Correct answer: A

Optic nerve invasion Retinoblastoma, the most common intraocular cancer in children, can spread outside the eye through several pathways. While hematogenous spread (B) to distant sites like bone marrow and direct invasion (C) through the sclera into the orbit can occur, the most common and prognostically significant route of extraocular dissemination is direct invasion along the optic nerve. The tumor cells can infiltrate the optic nerve head and travel posteriorly, past the lamina cribrosa, into the subarachnoid space. This provides a direct pathway for the cancer to spread to the central nervous system (CNS), leading to intracranial and leptomeningeal metastases. This is a devastating complication that dramatically worsens

the prognosis. For this reason, assessing the extent of optic nerve invasion during the histopathological examination of the enucleated eye is a critical part of staging the disease and determining the need for adjuvant therapy. Lymphatic spread (D) is not a typical feature of retinoblastoma.

Question 82. Which device in conventional oxygen therapy will provide the highest FiO 2 ?

A. Venturi mask

B. Hudson mask

C. Non-rebreathing mask

D. Nasal cannula

Correct answer: C

Non-rebreathing mask of approximately 80% to over 95%, making it the device of choice for treating severe hypoxemia.

Question 83. A COVID-19 patient who received treatment with steroids and remdesivir is being discharged. What follow-up evaluations or monitoring should they be advised to undergo? Select the correct combination from the options provided. 1. Repeat RT-PCR after 7 days of discharge 2. Watch for the persistence of anosmia 3. Watch for headache and nasal discharge 4. Monitor glucose levels 5. Watch for sinusitis symptoms

A. 1, 3 and 4

B. 2, 3 and 4

C. 3, 4 and 5

D. 1, 2, 3, 4 and 5

Correct answer: C

3, 4 and 5 This question relates to complications and follow-up after moderate to severe COVID-19, particularly in the context of the delta wave in India when mucormycosis was prevalent. Corticosteroid use, a mainstay of treatment, can cause hyperglycemia, so patients (especially diabetics) need to monitor their glucose levels (4) post-discharge. Steroids and the virus itself are immunosuppressive, increasing the risk of secondary infections. There was a major association between COVID-19 and invasive fungal sinusitis, particularly mucormycosis. Patients were advised to be vigilant for warning signs, which include headache, facial pain, nasal discharge (often blackish), and other sinusitis symptoms (3, 5). Persistent anosmia (2) is a common long-COVID symptom but not an urgent one to monitor for acute complications. Repeating the RT-PCR (1) is not recommended as it can remain positive for weeks due to non-viable viral fragments.

Question 84. A 50-year-old man arrives with sudden onset of right-sided weakness

and aphasia within the past two hours. His blood pressure is 160/110 mmHg, and his non-contrast CT (NCCT) head scan shows no abnormalities. What should be the next step in his management?

A. CT angiography to look for large vessel occlusion

B. MRI to look for infarct

C. Tab Labetalol 10 mg stat

D. Thrombolysis

Correct answer: D

Thrombolysis The patient presents with classic signs of an acute ischemic stroke (sudden onset of focal neurological deficits). He is within the critical time window for intervention (less than 4.5 hours from symptom onset). The non-contrast CT scan has successfully ruled out an intracranial hemorrhage, which is its primary purpose in this setting. His blood pressure of 160/110 mmHg is elevated but is below the threshold of 185/110 mmHg, which is the upper limit for administering thrombolytic therapy. Since there are no contra indications present, the most appropriate and time-sensitive next step is to proceed with intravenous thrombolysis using a tissue plasminogen activator like alteplase. This intervention can restore blood flow to the ischemic brain tissue and potentially reverse or reduce the neurological deficit. While a CT angiography (A) is important for identifying a large vessel occlusion that might require mechanical thrombectomy, it should not delay the administration of IV thrombolysis if the patient is eligible.

Question 85. Which statement regarding syndrome of inappropriate antidiuretic hormone secretion (SIADH) is incorrect?

A. Urinary sodium < 20 mEq/L

B. Serum sodium < 135 mEq/L

C. Urine osmolality > 100 mosm/kg

D. Patient can be clinically euvolemic to hypervolemic

Correct answer: A

Urinary sodium < 20 mEq/L The Syndrome of Inappropriate Antidiuretic Hormone Secretion (SIADH) is a disorder of impaired water excretion caused by the non-physiological release of ADH. This leads to the retention of free water, which dilutes the body's sodium, resulting in euvolemic hyponatremia. The diagnostic criteria include : (B) Hyponatremia with a corresponding low serum osmolality, so serum sodium < 135 mEq/L (B) is correct. (C) Inappropriately concentrated urine relative to the serum osmolality, so urine osmolality > 100 mOsm/kg (C) is correct. (D) The patient is typically clinically euvolemic (D), without signs of dehydration or significant edema. In response to the water retention, the body tries to excrete sodium to maintain volume balance. This results in a high urinary sodium concentration, typically > 40 mEq/L. The statement that urinary sodium is < 20 mEq/L (A) is therefore

incorrect. A low urinary sodium would be expected in hypovolemic hyponatremia.

Question 86. What is the treatment of choice for providing symptom relief during an acute cluster headache attack?

A. Oral sumatriptan

B. Subcutaneous sumatriptan

C. 100% oxygen at 6 L/minute

D. 100% oxygen at 8 L/minute

Correct answer: B

Subcutaneous sumatriptan Cluster headache is an excruciatingly severe, unilateral headache with a rapid onset. The acute (abortive) treatment needs to be very fast-acting. Oral sumatriptan (A) has a slow onset of action and is generally ineffective for the rapid relief required. The two first-line abortive treatments are high-flow oxygen and injectable sumatriptan. Inhaling 100% oxygen via a non-rebreather mask is a highly effective treatment, but it must be administered at a high flow rate, typically 12 to 15 L/minute, not the lower rates of 6 or 8 L/minute mentioned in options C and D. The other first-line option, which is extremely effective and rapid, is subcutaneous sumatriptan (usually a 6 mg injection). Its rapid absorption provides relief within minutes. Given that the oxygen flow rates offered in the options are suboptimal, subcutaneous sumatriptan stands out as the most effective and correctly described first-line choice.

Question 87. What is the most reliable diagnostic test for identifying myocarditis?

A. Endo-myocardial biopsy

B. Magnetic Resonance Imaging

C. Brain natriuretic Peptide

D. LDH1 to LDH2 ratio

Correct answer: A

Endo-myocardial biopsy Myocarditis is an inflammatory disease of the heart muscle. While clinical presentation, ECG changes, elevated cardiac enzymes (like troponin), and imaging can all be suggestive, the definitive gold standard for the diagnosis of myocarditis is an endomyocardial biopsy (EMB). The biopsy allows for direct histopathological examination of the heart tissue. The diagnosis is confirmed by the Dallas criteria, which require the presence of an inflammatory infiltrate within the myocardium associated with myocyte damage or necrosis that is not characteristic of an ischemic event. While cardiac Magnetic Resonance Imaging (MRI) (B) with late gadolinium enhancement has become a crucial and highly accurate non-invasive tool for diagnosing myocarditis (showing characteristic patterns of inflammation and scar), the EMB remains the definitive, albeit invasive, gold standard test. BNP (C) is a marker of heart failure, and LDH ratios (D) are outdated markers for MI.

Question 88. What is a characteristic feature observed in osteoporosis?

A. Normal calcium and increased ALP

B. Normal calcium and normal ALP

C. Decreased calcium and normal ALP

D. Increased calcium and increased ALP

Correct answer: B

Normal calcium and normal ALP Osteoporosis is a metabolic bone disease characterized by low bone mass and micro architectural deterioration of bone tissue, leading to increased fracture risk. It is a disorder of bone quantity and quality, but not typically a disorder of bone mineral metabolism itself. In the most common form, postmenopausal or senile osteoporosis, the fundamental bone remodeling process remains coupled, although the rate of resorption exceeds the rate of formation. As a result, the serum levels of key biochemical markers of bone turnover are characteristically normal. This includes normal serum calcium, normal serum phosphate, and normal alkaline phosphatase (ALP). An elevated ALP (A, D) would suggest other conditions like Paget's disease, osteomalacia, or a recent fracture. Abnormal calcium levels (C, D) would point to disorders of parathyroid hormone or vitamin D. page 531 INICET Examination Paper

Question 89. Which congenital heart defect shows equal oxygen saturation in all four cardiac chambers?

A. Tetralogy of Fallot

B. Total anomalous pulmonary venous circulation

C. Tricuspid atresia

D. Transposition of great arteries

Correct answer: B

Total anomalous pulmonary venous circulation In a healthy heart, the oxygen saturation in the right-sided chambers (carrying deoxygenated systemic venous blood) is much lower than in the left-sided chambers (carrying oxygenated pulmonary venous blood). A condition where saturation levels are equivalent across all four chambers indicates a complete mixing of the systemic and pulmonary venous returns. This occurs in Total Anomalous Pulmonary Venous Connection/Circulation (TAPVC). In TAPVC, all four pulmonary veins, which should drain into the left atrium, instead drain anomalously into the systemic venous circulation (e.g., into the superior vena cava or right atrium). This results in the entire pulmonary venous return mixing with the systemic venous return in the right atrium. For the infant to survive, there must be an interatrial communication (an ASD or PFO) allowing this mixed blood to pass from the right atrium to the left atrium and then to the systemic circulation. This complete mixing results in nearly identical oxygen saturation in all chambers.

Question 90. Which of the following statements accurately describes Korsakoff

syndrome?

A. Triad of confusion, ophthalmoplegia, and ataxia

B. Loss of long-term memory but intact personality

C. Anterograde amnesia with loss of recent memory

D. Loss of implicit memory and immediate recall

Correct answer: C

Anterograde amnesia with loss of recent memory Korsakoff syndrome is a chronic neurological disorder that is often a sequela of an untreated episode of Wernicke's encephalopathy, both caused by severe thiamine (Vitamin B1) deficiency, typically in the setting of chronic alcoholism. The statement describing the triad of confusion, ophthalmoplegia, and ataxia (A) is the classic presentation of acute Wernicke's encephalopathy, not Korsakoff syndrome. The hallmark of Korsakoff syndrome is a profound and disproportionate memory deficit. The most prominent feature is severe anterograde amnesia, which is the inability to form new memories. Patients also have a significant retrograde amnesia affecting recent events more than distant ones. A characteristic feature is confabulation, where the patient invents memories to fill in the gaps. Immediate recall (digit span) and implicit memory (D) are often relatively preserved, as are other cognitive functions and personality (B).

Question 91. A 32-year-old man is brought to the emergency department after a road traffic accident with head injury and is on mechanical ventilation. He opens his eyes to verbal commands and shows spontaneous movement in all four limbs. What is his Glasgow Coma Scale (GCS) score?

A. Eyes-2, Verbal-1, Motor-5

B. Eyes-2, Verbal-NT, Motor-5

C. Eyes-3, Verbal-2, Motor-6

D. Eyes-3, Verbal-NT, Motor-6

Correct answer: D

Eyes-3, Verbal-NT, Motor-6. The Glasgow Coma Scale (GCS) is used to assess a patient's level of consciousness. The score is calculated by evaluating three components : eye-opening, verbal response, and motor response. Eye Response (E = 3) : The patient opens his eyes in response to a verbal command. This corresponds to a score of 3 on the GCS scale. 4 : Spontaneous 3 : To speech 2 : To pain 1 : None Verbal Response (V = NT) : The patient is receiving mechanical ventilation, which means he is intubated with an endotracheal tube. This tube passes through the vocal cords, making it physically impossible for him to speak. In such cases, the verbal response cannot be tested, so it is recorded as NT (Not Testable). It would be incorrect to assign a score of 1 (no sounds), as that would imply a neurological inability to respond rather than a physical obstruction. Motor Response (M = 6) : The patient can follow a verbal command to open his eyes, which indicates he can process and respond to instructions. Therefore, it is

assumed he can also obey motor commands (e.g., "squeeze my hand," "show me two fingers"). This is the highest motor response, scoring a 6. The "spontaneous movement" further supports that he is not posturing or paralyzed. The final GCS score is E3, V(NT), M6.

Question 92. While receiving the second dose of a COVID vaccine, a patient developed a flabby, flattened, and asymmetrical shoulder, and the nurse noticed a loss of the normal shoulder contour. Which structure was likely injured, and could this injury have been avoided?

A. Rotator cuff

B. Posterior circumflex artery

C. Lateral cutaneous nerve of arm

D. Axillary nerve

Correct answer: D

Axillary nerve The described signs—a flabby, flat shoulder with loss of the normal rounded contour—are classic for deltoid muscle atrophy. The deltoid muscle is the main muscle that gives the shoulder its shape, and it is responsible for abduction of the arm. The deltoid muscle is innervated by the axillary nerve. The recommended site for an intramuscular injection in the shoulder is the center of the deltoid muscle. If the injection is given too low, near the surgical neck of the humerus where the axillary nerve winds around, the nerve can be injured by the needle. This iatrogenic injury to the axillary nerve would lead to denervation and subsequent atrophy of the deltoid muscle, resulting in the observed flattening of the shoulder contour and weakness in abduction. This is a known, though rare, complication of shoulder injections and is preventable by using the correct landmarking technique for the injection.

Question 93. A 45-year-old man has had progressive weakness in both lower limbs for a year, which has recently begun affecting his upper limbs. Examination shows lower-limb weakness, wasting of the left upper limb muscles, a positive Babinski sign, and absent deep tendon reflexes, with no sensory or autonomic involvement. What is the most likely diagnosis?

A. Multiple Sclerosis (MS)

B. Amyotrophic Lateral Sclerosis (ALS)

C. Guillain-Barré Syndrome (GBS)

D. Tropical Spastic Paraparesis

Correct answer: B

Amyotrophic Lateral Sclerosis (ALS) This clinical presentation is classic for Amyotrophic Lateral Sclerosis (ALS), also known as motor neuron disease. The defining feature of ALS is the combination of both upper motor neuron (UMN) and lower motor neuron (LMN) signs, with no sensory or autonomic involvement. In this patient, the positive Babinski sign is a clear UMN sign, indicating damage to the corticospinal tracts. The muscle wasting (atrophy) and absence

of deep tendon reflexes (areflexia) are classic LMN signs, indicating degeneration of the anterior horn cells in the spinal cord. The progressive, asymmetrical weakness spreading from the lower to the upper limbs is also a typical pattern. GBS (C) is an acute demyelinating polyneuropathy and presents with only LMN signs. MS (A) is a UMN disease but typically has sensory and visual symptoms. The unique combination of UMN and LMN signs is the hallmark of ALS.

Question 94. A 62-year-old man with heart failure awaiting a heart transplant develops severe respiratory distress four hours after receiving two units of whole blood. He is now hypoxemic, tachycardic, and has an increased mean arterial pressure, along with abnormal renal function results and a hemoglobin level of 6 g/dL. Given this presentation, which test should be performed next? 1. Chest X-ray 2. Brain Natriuretic Peptide (BNP) level 3. Absolute Neutrophil Count 4. Leucocyte Antibodies 5. Platelets

A. 4 and 5

B. 3 and 5

C. 1 and 2

D. 2 only

Correct answer: A

4 and 5 The clinical picture suggests a transfusion-related acute lung injury (TRALI). This patient develops severe respiratory distress within 4 hours of blood transfusion, with hypoxemia and tachycardia. The timing strongly points toward an acute transfusion reaction. TRALI typically presents within 6 hours of transfusion with acute hypoxemia and non-cardiogenic pulmonary edema. It is caused by donor anti-leukocyte (anti-HLA or anti-neutrophil) antibodies reacting with recipient leukocytes, leading to neutrophil activation in pulmonary capillaries and capillary leak. To confirm TRALI, the appropriate next tests are : 1. Leukocyte (anti-HLA/anti-neutrophil) antibodies in donor and recipient 2. Platelet count, as thrombocytopenia may occur due to immune activation Chest X-ray may show pulmonary edema, but it does not differentiate TRALI from cardiogenic pulmonary edema. BNP testing is useful for distinguishing transfusion-associated circulatory overload (TACO), but the question emphasizes immune-mediated pathology. Absolute neutrophil count is not diagnostic. Thus, to evaluate for antibody-mediated transfusion reaction consistent with TRALI, the correct next investigations are : (A) 4 and 5.

Question 95. Which one of the options listed below is classified as a centrally acting opioid antitussive?

A. Ambroxol

B. Diphenoxylate

C. Levopropoxyphene

D. Levorphanol

Correct answer: C

Levopropoxyphene This drug is specifically classified as a centrally acting opioid antitussive. It works by directly suppressing the cough reflex center in the medulla oblongata of the brainstem. It is the levo-isomer of propoxyphene and, unlike its dextro-isomer (an analgesic), it has minimal pain-relieving effects, making its primary therapeutic use the suppression of non-productive coughs. Why the Other Options are Incorrect (A) Ambroxol : This is a mucolytic, not an antitussive. It works peripherally by thinning mucus in the airways to make it easier to expel, rather than suppressing the cough reflex centrally. (B) Diphenoxylate : This is an opioid agonist used primarily as an antidiarrheal. It slows intestinal motility and is not classified or used as a cough suppressant. (D) Levorphanol : This is a potent opioid analgesic for severe pain. While most strong opioids possess antitussive properties as a secondary effect, Levorphanol's main classification is as a powerful pain reliever, not primarily as an antitussive. page 535 INICET Examination Paper PEDIATRICS

Question 96. Ventilatory support is required if SpO 2 becomes less than 90% because:

A. Tissues become vulnerable to hypoxía below 90%

B. Peripheral chemoreceptors become insensitive to hypoxia below 90%

C. Central chemoreceptors become insensitive to hypoxia below 90%

D. Patient's capacity to generate adequate tidal volume decreases below 90%

Correct answer: A

Tissues become vulnerable to hypoxía below 90% The relationship between oxygen saturation (SpO 2) and the partial pressure of oxygen in the arterial blood (PaO 2) is described by the oxyhemoglobin dissociation curve. This curve is S-shaped (sigmoidal). In the upper, flat portion of the curve, large changes in PaO 2 result in only small changes in SpO 2 . However, the curve becomes very steep below an SpO 2 of approximately 90%. An SpO 2 of 90% corresponds to a PaO 2 of about 60 mmHg. Below this critical point, even a small decrease in SpO 2 reflects a large and dangerous drop in the PaO 2 . This severe hypoxemia significantly impairs the delivery of oxygen to the tissues. Therefore, an SpO 2 of less than 90% is a critical threshold indicating that the patient has significant hypoxemia and the tissues are vulnerable to hypoxic injury, necessitating urgent intervention with supplemental oxygen or ventilatory support. Chemoreceptors (B, C) actually become more stimulated by hypoxia. SURGERY

Question 97. For a patient who had cough and fever due to COVID-19 but recovered without needing hospitalization, how long should elective surgery be deferred?

A. 6 weeks

B. 8-10 weeks

C. 12 weeks

D. 4 weeks

Correct answer: A

6 weeks Current perioperative guidelines recommend postponing elective surgery after COVID-19 infection to reduce postoperative pulmonary and thrombotic complications. The recommended delay depends on severity of illness. For patients who had symptomatic COVID-19 (e.g., cough and fever) but did not require hospitalization, surgery should generally be deferred for at least 6 weeks from the date of diagnosis or symptom onset. Rationale : 1. COVID-19 can cause residual pulmonary inflammation and endothelial dysfunction. 2. Early surgery (within 6 weeks) is associated with increased risk of postoperative pneumonia, respiratory failure, thromboembolism, and mortality. 3. Waiting 6 weeks allows recovery of pulmonary function and reduction of systemic inflammatory effects. For more severe cases : 4. Hospitalized patients or those with comorbidities may require 8–10 weeks delay. 5. ICU admission or severe disease may require 12 weeks or more. Since this patient had mild symptomatic infection and recovered without hospitalization, the recommended deferral period is 6 weeks. Therefore, the correct answer is (A) 6 weeks.

Question 98. What is the likely diagnosis for a 60-year-old male who, during a laparoscopic cholecystectomy, exhibits a sudden drop in end-tidal carbon dioxide (EtCO 2) to 8 mmHg, a reduction in oxygen saturation (SpO 2) to 90%, a decrease in blood pressure to 80/50 mmHg, and a peak airway pressure of 18 cm H 2 O? 1. Single bronchus intubation 2. Both pneumothorax and single bronchus intubation 3. CO 2 embolism 4. Severe bronchospasm

A. 4 only

B. Both 3 and 4

C. 3 only

D. 2 only

Correct answer: C

3 only This is a classic presentation of a gas embolism, specifically a carbon dioxide (CO 2) embolism, during laparoscopic surgery. The triad of sudden, profound hypotension, a sharp decrease in end-tidal CO 2 , and hypoxemia is pathognomonic. During laparoscopy, the abdomen is insufflated with CO 2 . If a vessel is inadvertently injured, a large volume of gas can enter the venous circulation and travel to the right heart and pulmonary artery, causing an air lock that obstructs pulmonary blood flow. This catastrophic drop in pulmonary perfusion leads to a massive increase in dead space ventilation, which is why the EtCO 2 plummets. The obstruction also causes right heart failure and circulatory collapse (hypotension). Bronchospasm (4) or single bronchus intubation (1) would cause an increase in airway pressure and potentially an increase in EtCO 2 , not a sudden drop.

Question 99. What is the most likely diagnosis for an elderly woman presenting with

confusion, thirst, abdominal pain, pallor, and thoracic spine tenderness, whose X-ray shows osteolytic lesions and lab results indicate: 1. Hemoglobin (Hb): 6.9 g/dl 2. White blood cell count (WBC): 4000/cm3 with a normal differential 3. Serum calcium: 13 mg/dl 4. Creatinine: 2.3 mg/dl 5. Total protein: 9 g/dl 6. Albumin: 2.4 g/dl

A. Metastatic breast cancer

B. Multiple myeloma

C. Primary hyperparathyroidism

D. Milk-alkali syndrome

Correct answer: B

Multiple myeloma This patient presents with the classic CRAB criteria for multiple myeloma, a malignancy of plasma cells. 1. C (Hypercalcemia) : Her serum calcium is high at 13 mg/dL, explaining her confusion and thirst. 2. R (Renal failure) : Her creatinine is elevated at 2.3 mg/dL, indicating renal impairment, which is common in myeloma ("myeloma kidney"). 3. A (Anemia) : Her hemoglobin is low at 6.9 g/dL (pallor), due to bone marrow infiltration by plasma cells. 4. B (Bone lesions) : She has thoracic spine tenderness and osteolytic lesions on X-ray, caused by the proliferation of plasma cells in the bone marrow. Furthermore, the high total protein with a low albumin level suggests a large monoclonal gammopathy (a high globulin gap), which is the hallmark of myeloma. This complete picture is diagnostic of multiple myeloma.

Question 100. Which of the following is not employed in post- laryngectomy rehabilitation?

A. Tracheo-esophageal prosthesis

B. Esophageal speech

C. Polite yawning

D. Super supraglottic swallow

Correct answer: D

Super supraglottic swallow After a total laryngectomy, the patient loses their natural voice box (the larynx) and breathes through a stoma in the neck. Voice rehabilitation is a critical part of their recovery. The three main methods for alaryngeal speech are : 1. Tracheo-esophageal prosthesis (TEP) (A) : A one-way valve is placed in a surgically created fistula between the trachea and the esophagus. The patient covers their stoma, diverts air into the esophagus, and the vibrating pharyngoesophageal segment produces sound. 2. Esophageal speech (B) : The patient learns to swallow or inject air into the esophagus and then release it in a controlled manner to create a "belch-like" sound that can be shaped into speech. 3. Electrolarynx : An external electronic device held against the neck produces vibrations. Polite yawning (C) is a technique used to relax the pharyngeal muscles, which can be helpful in learning esophageal speech. The super-supraglottic swallow (D) is a swallowing maneuver taught to patients who have undergone a supraglottic (partial) laryngectomy to protect their airway from aspiration. It

is irrelevant after a total laryngectomy, as the airway and esophagus are permanently separated.

Question 101. A patient presents to the outpatient clinic with a burn on the right thigh featuring a moist, red, blistered lesion and a sharply defined distal margin. What is the most probable cause of this burn?

A. Electric burn

B. Chemical burn

C. Dry heat

D. Moist heat

Correct answer: D

Moist heat The description of the burn provides key clues to its etiology. The lesion is damp, red, and blistered, which is characteristic of a partial-thickness burn. The crucial finding is the clear demarcation line extending distally. This pattern is typical of a scald burn caused by a hot liquid, or moist heat. When a hot liquid is spilled on the body, it runs downwards due to gravity, creating a burn with a "trickle-down" pattern and a very sharp, clear line of demarcation at the point where the liquid stopped or was absorbed by clothing. In contrast, a burn from dry heat (C) (e.g., a flame or hot object) would have a less distinct margin, corresponding to the area of contact. An electric burn (A) would have distinct entry and exit wounds. A chemical burn (B) can have sharp margins but often has associated coagulation necrosis or specific coloration depending on the agent.

Question 102. Which of the following observations manifests later in compartment syndrome?

A. Pallor

B. Paralysis

C. Pulselessness

D. Pain on passive stretch

Correct answer: B

Paralysis Compartment syndrome occurs when increased pressure within a closed fascial compartment compromises circulation and tissue perfusion. The classic clinical features are remembered as the “6 Ps” : Pain, Paresthesia, Pallor, Paralysis, Pulselessness, and Poikilothermia. The earliest and most sensitive sign is pain, especially pain out of proportion to injury and pain on passive stretch of the muscles within the affected compartment. As pressure increases, nerve ischemia develops, leading to paresthesia (early sensory change). With further compromise of arterial flow, pallor and diminished pulses may occur, although pulselessness is typically a late finding. Paralysis is a very late manifestation. It indicates prolonged nerve and muscle ischemia with possible irreversible damage. By the time paralysis appears, significant tissue necrosis may have already occurred, and urgent fasciotomy may not fully reverse

deficits. Therefore, among the given options, the observation that manifests later in compartment syndrome is : (B) Paralysis.

Question 103. What is the most appropriate management strategy for a female patient who is experiencing abdominal pain and increased heart rate three days post-cholecystectomy, has a leukocytosis (WBC count of , /) cells mm 11 000 3 and shows a 5×5 cm fluid collection in the subhepatic space on ultrasound?

A. Antibiotics and send home

B. USG-guided pigtail catheter drainage

C. Laparoscopy and re-exploration

D. ERCP and T-tube placement Click Here to Buy book on Amazon MEDINK

Correct answer: A

Bochdalek hernia The provided chest X-ray shows the presence of multiple air-filled loops of bowel within the right hemithorax. The heart and mediastinum are shifted to the left. This finding is diagnostic of a congenital diaphragmatic hernia (CDH), where there is a defect in the diaphragm allowing abdominal contents to herniate into the chest cavity. The most common type of CDH is a Bochdalek hernia, which is a posterolateral defect, occurring on the left side in about 85% of cases and on the right side in about 15%. While most are diagnosed in the neonatal period with severe respiratory distress, a smaller hernia, particularly on the right side where the liver can plug the defect, may present later in childhood with milder, intermittent symptoms like abdominal pain, as described in this case. A Morgagni hernia (B) is an anterior defect. Gastric volvulus (C) is a twisting of the stomach.

Question 104. A 55-year-old woman underwent breast- conserving surgery for a 4 × 3 cm lump in the right upper outer quadrant. She has no axillary lymph node involvement, and mammography showed BIRADS 4b. Histology reveals high– nuclear grade ductal carcinoma in situ (DCIS) with necrosis and a 10 mm clear margin. What should be the next step in her management?

A. Adjuvant radiotherapy

B. Adjuvant chemotherapy

C. Follow up 6 monthly for 2 years and then yearly follow up

D. Trastuzumab therapy

Correct answer: A

Adjuvant radiotherapy The patient has been treated with breast-conserving surgery (lumpectomy) for Ductal Carcinoma in Situ (DCIS). The goal of subsequent treatment is to reduce the risk of local recurrence, which can be either another episode of DCIS or an invasive breast cancer. Several factors increase the risk of recurrence, including high nuclear grade and the presence of necrosis (comedonecrosis), both of which are present in this patient. Even with clear surgical margins, the standard of care for a patient with these high-risk features of DCIS

who has undergone breast conservation is to receive adjuvant radiotherapy to the entire breast. Large randomized trials have conclusively shown that adding radiation therapy after lumpectomy for DCIS reduces the risk of local recurrence by approximately 50%. Adjuvant chemotherapy (B) and trastuzumab (D) are not used for non-invasive DCIS. Observation alone (C) would be an option only for very low-risk DCIS.

Question 105. What is the needle placement angle when using the interrupted suturing technique to suture a laceration in the Emergency Room (ER)?

A. 60 degrees

B. 70 degrees

C. 80 degrees

D. 90 degrees

Correct answer: D

90 degrees Proper suturing technique is essential for achieving good wound apposition and cosmetic results while minimizing scarring. When placing a simple interrupted suture, the goal is to evert the wound edges slightly. This is achieved by ensuring the needle enters and exits the skin at the correct angle and distance. The needle should enter the skin surface at a 90-degree angle. This perpendicular entry allows the needle to follow a curved path through the dermis, taking a wider bite of tissue at the base of the wound than at the surface. When the suture is tied, this configuration causes the wound edges to roll slightly upwards and evert. Entering the skin at an oblique angle (A, B, C) is incorrect technique and tends to invert the wound edges, which can lead to a depressed and more prominent scar after healing.

Question 106. Which of the following statements are accurate? 1. Due to increasing mammography there occurs over-diagnosis of breast carcinoma 2. Colon cancer screening is done by digital rectal examination 3. Oral cancer screening is done by visual inspection 4. Cervix cancer screening is done by a pap smear

A. 2,3,4

B. 1, 2, 3, 4

C. 4 only

D. 1,3,4

Correct answer: D

1,3,4 1. True. The widespread use of screening mammography has led to an increase in the detection of very early-stage breast cancers, particularly Ductal Carcinoma in Situ (DCIS). It is a subject of ongoing debate that some of these lesions might never have progressed to become clinically significant, leading to a phenomenon of over-diagnosis and potential overtreatment. 2. False. While a digital rectal examination (DRE) can detect some rectal cancers, it is not considered a primary screening tool for colorectal cancer. The primary screening methods include stool-based tests (like FIT) and endoscopic examinations (colonoscopy or

sigmoidoscopy). 3. True. Screening for oral cancer, particularly in high-risk populations, is effectively done by a thorough visual inspection of the oral cavity and oropharynx by a trained healthcare professional to look for suspicious lesions. 4. True. The Pap smear (Papanicolaou test) is the classic and highly effective screening method for cervical cancer, used to detect precancerous cellular changes (dysplasia) on the cervix.

Question 107. During an appendectomy that begins with a gridiron incision, which anatomical structures does the surgeon cut through? 1. External oblique 2. Internal oblique 3. Transversus abdominis 4. Rectus abdominis

A. 1,3,4

B. 2,3,4

C. 1,2,3

D. 1,2,4

Correct answer: C

1,2,3 A gridiron incision (or McBurney's incision) is a muscle-splitting incision used for open appendectomy. It is centered over McBurney's point in the right lower quadrant. The layers are opened sequentially : 1. The skin and subcutaneous tissue are incised. 2. The aponeurosis of the external oblique muscle is incised in the direction of its fibers. 3. The fibers of the internal oblique and the underlying transversus abdominis muscles are then split (not cut) in the direction of their fibers, which runs roughly perpendicular to the external oblique fibers. This creates the "gridiron" pattern. 4. The transversalis fascia and peritoneum are then incised to enter the abdominal cavity. The rectus abdominis muscle (4) is located medially and is not incised or split during a standard gridiron incision. page 533 INICET Examination Paper

Question 108. What is the probable diagnosis in a 5-year-old child who presents with unilateral proptosis and has a tumor that tests positive for desmin?

A. Ewing's sarcoma

B. Embryonal rhabdomyosarcoma

C. Leukemia

D. Retinoblastoma

Correct answer: B

Embryonal rhabdomyosarcoma Rhabdomyosarcoma is the most common soft tissue sarcoma in children. One of the most common primary sites for this tumor is the head and neck region, including the orbit. An orbital rhabdomyosarcoma typically presents with a rapidly developing proptosis (protrusion of the eyeball) in a young child. The diagnosis is confirmed by biopsy and immunohistochemistry. Rhabdomyosarcomas are tumors of primitive skeletal muscle cells (rhabdomyoblasts). A key immunohistochemical marker that confirms skeletal muscle differentiation is desmin, an intermediate filament protein found in muscle cells. Therefore, a desmin-positive tumor causing proptosis in a 5-year-old is the classic presentation of embryonal

rhabdomyosarcoma, the most common histologic subtype in this age group. Ewing's sarcoma (A) is typically a bone tumor. Leukemia (C) can present with orbital infiltration (chloroma), but would have different markers. Retinoblastoma (D) is an intraocular tumor.

Question 109. Which of the statements below accurately describes congenital CMV infection?

A. About 20-30% of the infections are symptomatic

B. Triad of SNHL, periventricular calcification, and enamel hypoplasia

C. Most children asymptomatic at birth can develop conductive hearing loss later in life

D. If mother is IgG positive for CMV, the child is unlikely to develop an infection

Correct answer: D

If mother is IgG positive for CMV, the child is unlikely to develop an infection. A mother who is CMV IgG positive has had a past infection and developed antibodies. This prior immunity makes transmission to her fetus during pregnancy much less likely. The risk of transmission from a non-primary infection (reactivation or reinfection) is only about 1-2%. This is significantly lower than the 30-40% transmission risk associated with a primary infection (a mother's first exposure) during pregnancy. Therefore, the presence of maternal IgG makes congenital infection "unlikely." Why the Other Options are Incorrect (A) This overstates the rate. Only about 10-15% of infants with congenital CMV are symptomatic at birth; the vast majority are asymptomatic. (B) This describes the wrong triad. The classic triad for symptomatic congenital CMV includes sensorineural hearing loss (SNHL), periventricular calcifications, and chorioretinitis (eye inflammation), not enamel hypoplasia. (C) While asymptomatic children can develop hearing loss, it is sensorineural, resulting from inner ear or nerve damage, not conductive hearing loss.

Question 110. As a component of the treatment for a child experiencing severe COVID, which of the options below is administered?

A. Corticosteroids

B. Ivermectin

C. Remdesivir

D. All of the above

Correct answer: A

Corticosteroids The management of severe COVID-19 in children, similar to adults, focuses on supportive care and modulating the inflammatory response. Severe COVID-19 and Multisystem Inflammatory Syndrome in Children (MIS-C) are characterized by a hyperinflammatory state. For hospitalized children requiring oxygen support due to severe COVID-19 or for children with MIS-C, corticosteroids (e.g., dexamethasone or methylprednisolone) are a cornerstone of therapy. They work by suppressing the excessive inflammatory response that leads to lung injury and organ dysfunction. Remdesivir (C), an antiviral, may be considered for certain

hospitalized pediatric patients, but its benefit is less established than in adults. Ivermectin (B) has been extensively studied and has been shown to have no clinical benefit in treating COVID-19, and it is not recommended by major health organizations for this purpose. Therefore, corticosteroids are the most established and critical component of treatment.

Question 111. A child presents with fever, vesicular lesions on the upper and lower limbs including the palms and soles, oral lesions, neck stiffness, and CSF findings showing normal glucose with elevated lymphocytes and protein. What is the most likely diagnosis?

A. Bacterial meningitis with sepsis

B. Coxsackie viral meningitis and Hand Foot Mouth disease

C. Herpes simplex gingivostomatitis and meningoencephalitis

D. Tuberculous meningitis

Correct answer: B

Coxsackie viral meningitis and Hand Foot Mouth disease This patient presents with two distinct clinical syndromes that are linked by a common etiology. The presence of vesicular lesions on the hands, feet (including palms and soles), and in the mouth is the pathognomonic presentation of Hand, Foot, and Mouth Disease (HFMD). The neurological symptoms of neck stiffness, along with a CSF profile showing a lymphocytic pleocytosis, elevated protein, and normal glucose, are the classic findings of aseptic (viral) meningitis. Both of these conditions are most commonly caused by enteroviruses, particularly Coxsackievirus (e.g., Coxsackie A16 for HFMD, other strains for meningitis) and Enterovirus 71. It is well-recognized that a patient can have both manifestations concurrently from a single enteroviral infection. Bacterial (A) and tuberculous (D) meningitis would typically show low glucose in the CSF. Herpes (C) has a different rash distribution.

Question 112. What are the factors that can lead to seizures in newborns? 1. Hypocalcemia 2. Hyponatremia 3. Hypomagnesemia 4. Hypoglycemia

A. 1, 2, 3 only

B. 1, 2, 3, and 4

C. 1, 3, 4 only

D. 2, 4 only

Correct answer: B

1, 2, 3, and 4 Neonatal seizures are a sign of significant underlying central nervous system dysfunction. A major category of causes is acute metabolic disturbances, as the neonatal brain is highly vulnerable to such imbalances. All four options listed are well-established metabolic causes of seizures in a newborn. Hypoglycemia (4) (low blood sugar) is a very common cause, as glucose is the brain's primary fuel. Electrolyte abnormalities are also frequent triggers. Hypocalcemia (1) (low calcium) and hypomagnesemia (3) (low magnesium) both increase

neuronal excitability and can precipitate seizures. Hyponatremia (2) (low sodium) can cause cerebral edema and is also a recognized cause of neonatal seizures. Therefore, all four of these metabolic derangements are important factors that can lead to seizures in the neonatal period and should be checked for in any seizing infant.

Question 113. At what age does a child reach half of their adult height?

A. 12-18 months

B. 20-24 months

C. 32-36 months

D. 40-48 months

Correct answer: B

20-24 months There is a well-known rule of thumb in pediatrics for predicting a child's final adult height based on their height at an early age. The rule states that a child's height at 2 years of age (24 months) is approximately half of their eventual adult height. Therefore, one can estimate the adult height by simply doubling the child's height at their second birthday. This approximation works reasonably well because the rapid growth of infancy has slowed, and the child has settled onto their genetic growth curve, but the pubertal growth spurt has not yet begun. The period of 20-24 months encompasses this two-year milestone. This provides a simple, though not perfectly precise, method for long-term height prediction.

Question 114. A 3-year-old child is found to have a palpable, movable, kidney-shaped mass on the right side of the abdomen during a bath, with a history of hematuria that resolved on its own two weeks earlier. Which additional investigations should be performed to evaluate this condition? 1. CECT 2. PET-CT 3. 24 hour urinary VMA 4. FNAC

A. 1 and 2

B. 2 and 4

C. 1, 2 and 3

D. 1, 2, 3 and 4

Correct answer: C

1, 2 and 3 A palpable abdominal mass in a 3-year-old child raises immediate suspicion of a pediatric malignancy, with the primary differentials being Wilms' tumor and neuroblastoma. A comprehensive workup is essential. A Contrast-Enhanced CT (CECT) of the abdomen (1) is the cornerstone of imaging to define the origin, size, and extent of the tumor. To differentiate between the two main possibilities, biochemical testing is crucial; a 24-hour urinary collection for catecholamine metabolites like VMA (3) is mandatory, as elevated levels are diagnostic for neuroblastoma. A PET-CT scan (2), specifically with MIBG for neuroblastoma or FDG for other tumors, is a standard part of the staging workup to look for distant metastases. However, Fine-Needle Aspiration or Cytology (FNAC) (4) is generally contraindicated for a suspected

Wilms' tumor. Puncturing the tumor capsule risks tumor spillage, which would upstage the disease and worsen the prognosis. Therefore, the appropriate investigations include CECT, PET-CT for staging, and urinary VMA, while FNAC is avoided.

Question 115. In a 14-month-old child diagnosed with Haemophilus influenzae meningitis, what reason might lead clinicians to change the initial treatment plan from ampicillin to ceftriaxone?

A. Hemophilus alters penicillin-binding protein sites, hence resistant to ampicillin

B. Easier to administer IV ceftriaxone than IV ampicillin

C. Cotrimoxazole is the drug of choice, but the patient is allergic to sulfa drugs

D. Hemophilus produces beta-lactamase, hence resistant to ampicillin

Correct answer: D

Haemophilus produces beta-lactamase, hence resistant to ampicillin This is a duplicate of a previous question. The most prevalent mechanism of resistance to ampicillin in Haemophilus influenzae is the production of the enzyme beta-lactamase. This enzyme effectively inactivates the ampicillin molecule by cleaving its beta-lactam ring, rendering the antibiotic useless. Due to the high prevalence of beta-lactamase-producing strains, ampicillin is no longer considered a reliable empirical choice for treating serious infections like meningitis caused by H. influenzae. Third-generation cephalosporins, such as ceftriaxone, are stable against these beta-lactamases and also achieve excellent concentrations in the cerebrospinal fluid. This makes them the current drug of choice for treating meningitis caused by this organism. Altering penicillin-binding protein sites (A) is a mechanism of resistance more characteristic of Streptococcus pneumoniae. The other options are incorrect justifications for the change in therapy. ORTHOPEDICS

Question 116. An elderly woman slipped at home and sustained a Colles fracture, which was treated with a plaster of Paris (POP) cast. What is the correct sequence for performing the reduction?

A. Traction, POP, palmar flexion, ulnar deviation

B. Traction, palmar flexion, ulnar deviation, POP

C. Traction, ulnar deviation, palmar flexion, POP

D. Palmar flexion, ulnar deviation, traction, POP

Correct answer: B

Traction, palmar flexion, ulnar deviation, POP A Colles' fracture is a fracture of the distal radius characterized by dorsal displacement, dorsal angulation, radial shift, and shortening. The closed reduction maneuver is designed to reverse these deformities in a specific sequence. 1. Traction : The first step is to apply sustained longitudinal traction to the hand and wrist. This serves to disimpact the fracture fragments and restore the length of the radius. 2. Palmar flexion : While maintaining traction, the distal fragment is pushed downwards into palmar flexion to correct the

characteristic dorsal angulation of the fracture. 3. Ulnar deviation : Next, the hand and wrist are pushed into ulnar deviation to correct the radial shift of the distal fragment. 4. POP (Plaster of Paris) cast : Once the reduction is achieved and confirmed radiographically, a plaster cast is applied to hold the fracture in the corrected position while it heals. This sequence ensures that each component of the deformity is addressed systematically before immobilization.

Question 117. Following a femoral shaft fracture, your consultant advises you to apply tibial traction. Which equipment should you request from the nurse? 1. Thomas splint 2. K-wire 3. Steinmann pin 4. Denham's pin 5. Bohler's stirrup 6. Bohler Braun splint

A. 1,2,4

B. 3,5,6

C. 3,4,5

D. 1, 2, 3, 4, 5, 6

Correct answer: B

3,5,6 Applying skeletal traction through the proximal tibia for a femur fracture requires a specific set of orthopedic equipment. First, a rigid pin must be passed through the bone; a Steinmann pin (3) is a smooth, large-diameter pin used for this purpose. A Denham's pin (4) is an alternative with a threaded center. Next, a Bohler's stirrup (5) is attached to the ends of the pin. This U-shaped device allows a traction cord and weights to be attached without touching the patient's skin. Finally, the entire injured limb needs to be supported in a specific position to counteract muscle forces and align the fracture. The Bohler Braun splint (6) is a metal frame designed for this purpose, elevating the leg and providing a pulley system for the traction weights. A Thomas splint (1) is used for first aid transport or different traction setups. A K-wire (2) is too thin for this application.

Question 118. If a pregnant woman at 36 weeks gestation is diagnosed with high blood pressure and a urine protein level of 3+, what additional symptoms would indicate a potential onset of eclampsia? 1. Headache 2. Blurred vision 3. Persistent pedal oedema 4. Epigastric pain

A. 2 and 4 only

B. 1 and 2 only

C. 1,2,3

D. 1,2,3,4

Correct answer: D

1,2,3,4 The patient has severe pre-eclampsia, defined by hypertension and significant proteinuria. Eclampsia is the occurrence of seizures in this setting. Certain symptoms, known as "severe features," act as warning signs for impending eclampsia and indicate severe end-organ involvement. These include : (1) Headache : A new-onset, persistent, and often severe

headache that does not respond to simple analgesics. (2) Blurred vision : Or other visual disturbances like scotomata (flashing lights) or diplopia, indicating cerebral vasospasm or retinal ischemia. (4) Epigastric or right upper quadrant pain : This is a very ominous sign caused by hepatic swelling and ischemia (HELLP syndrome). (3) While persistent pedal edema is no longer part of the diagnostic criteria for pre-eclampsia due to its low specificity, the rapid onset of severe, generalized edema is often seen with severe disease and is considered a concerning clinical sign. All listed symptoms can be associated with severe disease and increased risk for eclampsia.

Question 119. Which of the following options is not used in the management of polycystic ovarian disease (PCOD)?

A. Clomiphene citrate

B. Metformin

C. Tamoxifen

D. Oral Contraceptive Pills (OCP)

Correct answer: C

Tamoxifen Polycystic Ovary Syndrome (PCOS/PCOD) management is tailored to the patient's symptoms and goals. For menstrual cycle regulation and management of hirsutism, combined oral contraceptive pills (OCPs) (D) are a first-line therapy. For patients with associated insulin resistance or metabolic syndrome, metformin (B) is frequently used to improve insulin sensitivity and can help with cycle regulation and weight management. For women with PCOS who desire fertility, the first-line ovulation induction agent is clomiphene citrate (A) (or letrozole). Tamoxifen (C), however, is a selective estrogen receptor modulator (SERM). Its primary use is in the treatment and prevention of estrogen receptor-positive breast cancer. While it can have a mild ovulation-inducing effect and is sometimes used as a second-line agent for that purpose, it is not a standard or primary treatment employed for the general management of PCOS.

Question 120. Arrange the following steps in sequential order for the collection of samples for Pap smear testing: 1. Use posterior vaginal wall retractor 2. Take the sample 3. Make smear on a slide 4. Fix the smear

A. 1, 2, 4, 3

B. 2, 1, 3, 4

C. 3, 1, 2, 4

D. 1, 2, 3, 4

Correct answer: D

1, 2, 3, 4 The procedure for obtaining a conventional Pap smear follows a logical and critical sequence to ensure a high-quality, interpretable sample. First, a speculum (such as a Cusco's speculum, or a Sims' speculum with a posterior vaginal wall retractor) is inserted to visualize

the cervix. (Step 1) Once the cervix is fully visualized, a sampling device (such as an Ayre's spatula and/or a cytobrush) is used to take the sample by scraping cells from the ectocervix and endocervical canal. (Step 2) The collected cellular material is then immediately and evenly smeared onto a glass slide. (Step 3) To prevent air-drying artifacts which destroy cellular detail, the slide must be immediately fixed, either by immersing it in 95% ethanol or by using a spray fixative. (Step 4) This sequence ensures proper visualization, adequate sampling, correct preparation, and optimal preservation of the cells for cytological analysis.

Question 121. Which of the following measures is part of the Active Management of the Third Stage of Labor (AMTSL)?

A. Oxytocin is not given

B. Controlled cord traction

C. No uterine massage

D. No cord clamping

Correct answer: B

Controlled cord traction Active Management of the Third Stage of Labor (AMTSL) is a set of interventions designed to speed the delivery of the placenta and prevent postpartum hemorrhage. The three core components are : Administration of a uterotonic drug, most commonly oxytocin, immediately after the birth of the baby. Therefore, statement (A) is incorrect. Controlled cord traction (CCT) is applied to the umbilical cord while applying counter-traction on the uterus to facilitate placental delivery. Therefore, statement (B) is correct. Uterine massage is performed immediately after the delivery of the placenta to stimulate uterine contraction and prevent atony. Therefore, statement (C) is incorrect. Delayed cord clamping is now recommended before initiating AMTSL, but clamping (D) is still a part of the overall process. Out of the options, controlled cord traction is a key and defining component of the AMTSL package.

Question 122. Which among the following options does not contribute to the occurrence of secondary amenorrhea?

A. Turner's mosaic

B. Kallmann syndrome

C. Sheehan's syndrome

D. Asherman's syndrome

Correct answer: B

Kallmann syndrome Secondary amenorrhea is the cessation of menstruation for three or more months in a woman who has previously menstruated. Sheehan's syndrome (C), postpartum pituitary necrosis, causes hypopituitarism and secondary amenorrhea. Asherman's syndrome (D), intrauterine adhesions, is an anatomical cause of secondary amenorrhea. Turner's mosaic (e.g., 45,X/46,XX) (A) can allow for enough ovarian function for menarche to occur, followed by

premature ovarian failure, resulting in secondary amenorrhea. In contrast, Kallmann syndrome (B) is a form of congenital hypogonadotropic hypogonadism. Due to a failure of GnRH neuron migration, individuals with Kallmann syndrome do not undergo puberty and therefore never achieve menarche. It is a classic cause of primary amenorrhea, not secondary amenorrhea, as there were no prior periods to cease.

Question 123. In a semen analysis, what percentage range is considered normal for sperm morphology?

A. 10%

B. 4%

C. 6%

D. 8%

Correct answer: B

4% This is a duplicate of a previous question. According to the 5th and 6th editions of the World Health Organization (WHO) laboratory manual for the examination of human semen, the lower reference limit for sperm morphology is 4%. This means that for a semen sample to be considered normal in terms of morphology, at least 4% of the sperm must have a normal form when assessed using strict criteria (often referred to as Kruger's strict criteria). These criteria evaluate the precise dimensions and appearance of the sperm head, midpiece, and tail. A value below this 4% threshold is classified as teratozoospermia. Previous editions of the WHO manual used higher cutoff values (e.g., 14% or 30%), but the current, more stringent standard is 4%.

Question 124. Given the karyotype shown, what clinical features would typically be expected in individuals with this chromosomal pattern?

A. Gynecomastia and long limbs

B. Flat occiput

C. Webbing of neck and lymphedema

D. Short stature and polydactyly

Correct answer: A

Left occipital lobe The visual field charts show loss of the right half of the visual field in both eyes. This pattern represents a right homonymous hemianopia. In homonymous hemianopia, the same side of the visual field is lost in both eyes. This occurs due to a lesion posterior to the optic chiasm — specifically in the optic tract, lateral geniculate body, optic radiation, or occipital cortex on the opposite side of the visual field defect. Since the right visual field is lost, the lesion must be on the left side of the visual pathway (because visual pathways cross after the chiasm). Fibers from the right visual field of both eyes project to the left occipital lobe. An optic chiasm lesion would cause bitemporal hemianopia, not homonymous hemianopia. A lesion in the left lateral geniculate body could also produce a similar defect, but cortical lesions are the most common cause, especially when the defect is congruous and respects the vertical

meridian. Therefore, the most likely site of the lesion is the left occipital lobe. MEDICINE

Question 125. Please match the following syndromes with their corresponding karyotypes. Condition Karyotype 1. Turner's syndrome a. 46,XX 2. Swyer's syndrome b. 46,XY 3. Androgen insensitivity syndrome c. 46,XY 4. Mayer Rokitansky Kuster Hauser syn- drome d. 45,X

A. 1-d, 2-b, 3-c, 4-a

B. 1-b, 2-c, 3-d, 4-a

C. 1-a, 2-b, 3-c, 4-d

D. 1-d, 2-a, 3-c, 4-b

Correct answer: A

1-d, 2-b, 3-c, 4-a 1. Turner's syndrome : This is a disorder in females caused by the complete or partial absence of one X chromosome. The classic karyotype is 45,X (d). 2. Swyer's syndrome : This is a disorder of sex development where an individual has a 46,XY karyotype (b) but develops a female phenotype due to gonadal dysgenesis (non-functional streak gonads). 3. Androgen insensitivity syndrome (AIS) : This is a condition where an individual with a 46,XY karyotype (c) is resistant to the effects of androgens. They have testes but develop female external genitalia and secondary sexual characteristics (except for uterus and menses). 4. Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome : This is a condition affecting females, characterized by Müllerian agenesis (absence of the uterus and upper vagina). These individuals are genetically female with a normal 46,XX karyotype (a) and normal ovarian function.

Question 126. Which instruments are utilized during a cesarean section? 1. Bard-Parker blade 2. Doyen's retractor 3. Cusco's speculum 4. Allis forceps 5. Shirodkar's uterine clamp 6. Green Armytage forceps

A. 1,2,5,6

B. 1, 2, 3,5

C. 1,2,4,6

D. 1,2,3,6

Correct answer: C

1,2,4,6 A Cesarean section requires a specific set of surgical instruments. 1. Bard-Parker blade : A scalpel handle with a blade is used for the initial skin incision. 2. Doyen's retractor : A large, smooth, right-angled retractor used to retract the bladder inferiorly, protecting it from injury during the uterine incision. 4. Allis forceps : These tissue forceps with small teeth are used to grasp the edges of the uterine incision to control bleeding and facilitate delivery of the baby. 6. Green-Armytage forceps : These are large, hemostatic forceps specifically designed to be applied to the angles of the uterine incision to clamp the uterine vessels and control bleeding. Cusco's speculum (3) is a vaginal speculum and is not used in a Cesarean section. Shirodkar's

uterine clamp (5) is likely a typo or an instrument not standardly used; Shirodkar is associated with cerclage needles.

Question 127. What is the normal uterocervical length?

A. 3 cm

B. 5 cm

C. 7 cm

D. 10 cm

Correct answer: B

5 cm The uterocervical length refers to the combined length of the uterus and cervix in a non-pregnant adult woman. Normally, the uterus measures about 7–8 cm in total length. Out of this : 1. The uterine body measures approximately 5 cm 2. The cervix measures about 2–3 cm However, when specifically referring to uterocervical length in gynecological assessment (especially in imaging and anatomical context), the commonly accepted average measurement is about 5 cm for the functional uterocervical canal length. In obstetrics, cervical length alone is usually around 2.5–3 cm in non-pregnant women and is assessed separately from uterine length. Thus, among the given options, the normal uterocervical length is best represented by : (B) 5 cm.

Question 128. What are the symptoms observed in individuals with endometriosis? 1. Infertility 2. Dysmenorrhea 3. Vaginal discharge 4. Vaginal bleeding

A. 3,4

B. 2,3

C. 1,2

D. 1,2,4

Correct answer: C

1,2 Endometriosis is a condition where endometrial-like tissue grows outside the uterus. The classic triad of symptoms includes : (2) Dysmenorrhea : Cyclical pelvic pain, particularly severe pain during menstruation, is the most common symptom. The pain often starts before the period and lasts throughout. (1) Infertility : Endometriosis is a leading cause of female infertility, affecting approximately 30-50% of women with the condition. The inflammation and adhesions can distort pelvic anatomy and impair ovarian and tubal function. Dyspareunia : Deep pain during sexual intercourse. While abnormal uterine bleeding (e.g., menorrhagia) can sometimes be associated, abnormal vaginal discharge (3) is not a typical symptom of endometriosis. Vaginal bleeding (4) is too general; the key feature is painful bleeding (dysmenorrhea). The most consistent and defining symptoms from the list are infertility and dysmenorrhea.

Question 129. What is the first-line treatment for a woman who presents with frothy vaginal discharge and a strawberry-appearing cervix?

A. Metronidazole

B. Fluconazole

C. Tetracycline

D. Cefixime

Correct answer: A

Metronidazole The clinical findings of a profuse, thin, yellow-green, frothy vaginal discharge and a "strawberry cervix" (colpitis macularis), which are punctate hemorrhages on the cervix, are pathognomonic for trichomoniasis. This is a sexually transmitted infection caused by the protozoan parasite Trichomonas vaginalis. The recommended first-line treatment for trichomoniasis for both the patient and their sexual partners is a single 2-gram oral dose of metronidazole. An alternative regimen is metronidazole 500 mg orally twice daily for 7 days. Fluconazole (B) is an antifungal used for yeast infections. Tetracycline (C) and Cefixime (D) are antibiotics used for other bacterial infections like chlamydia and gonorrhea, respectively, but are not effective against the protozoan Trichomonas.

Question 130. A primigravida undergoes a per-vaginal examination showing a posterior cervix, 5 cm cervical length, 1 cm dilation, soft consistency, 50% effacement, and fetal head at –1 station. What is her Bishop score?

A. 8

B. 6

C. 3

D. 0

Correct answer: B

6 The Bishop score is used to assess the readiness of the cervix for labor induction. A score of 6 or higher is generally considered favorable, suggesting that induction is likely to be successful. The score is calculated by assessing five components of the cervix and fetal position. Here is the breakdown of the score based on the findings provided : 1. Cervical Position : Posterior = 0 points 2. Cervical Consistency : Soft = 2 points 3. Cervical Effacement : 50% = 1 point 4. Cervical Dilatation : 1 cm = 1 point 5. Fetal Station : -1 station = 2 points Total Score = 0 + 2 + 1 + 1 + 2 = 6 Each parameter is scored from 0 to 2 or 3. A posterior cervix is unfavorable and scores 0. A soft cervix is favorable and scores 2. Effacement of 50% falls into the 40-50% category, which scores 1 point. A dilatation of 1 cm scores 1 point. A fetal station of -1 is moderately favorable, scoring 2 points. Summing these values gives the final Bishop score of 6.

Question 131. What is the recommended dosage of carbetocin for preventing postpartum hemorrhage?

A. 50 mcg

B. 150 mcg

C. 200 mcg

D. 100 mcg

Correct answer: D

100 mcg Carbetocin is a long-acting synthetic analogue of oxytocin. It is a potent uterotonic agent used for the prevention of postpartum hemorrhage (PPH) due to uterine atony, particularly after Cesarean section. Unlike oxytocin, which requires a continuous infusion, carbetocin is administered as a single dose. The standard and recommended dose of carbetocin for the prevention of PPH is 100 micrograms (mcg), given as a single slow intravenous injection over one minute. This single dose provides a sustained uterotonic effect that lasts for several hours, making it a convenient alternative to an oxytocin infusion. It should be administered immediately after the delivery of the baby. The other dosages listed are incorrect for the standard PPH prevention protocol.

Question 132. To which biochemical moiety is beta hCG structurally similar?

A. LH

B. FSH

C. ACTH

D. Oxytocin

Correct answer: A

LH Human chorionic gonadotropin (hCG) is a glycoprotein hormone composed of two subunits, an alpha (α) subunit and a beta (β) subunit. The alpha subunit of hCG is structurally identical to the alpha subunits of three other pituitary glycoprotein hormones : luteinizing hormone (LH), follicle-stimulating hormone (FSH), and thyroid-stimulating hormone (TSH). The beta subunit is unique to each hormone and confers its biological specificity. However, the beta subunit of hCG shares significant structural homology (about 80% similarity) with the beta subunit of LH. Because of this marked similarity, hCG can bind to and activate the LH receptor. This is the physiological basis for hCG's primary function in early pregnancy, which is to "rescue" and maintain the corpus luteum to continue progesterone production until the placenta takes over this role.

Question 133. What hinders the production of milk during pregnancy?

A. Low luteinizing hormone

B. High estrogen

C. Human somatomammotropin

D. Low thyroid-stimulating hormone

Correct answer: B

High estrogen During pregnancy, the breast tissue undergoes significant development and proliferation (mammogenesis) under the influence of several hormones, including estrogen, progesterone, prolactin, and human placental lactogen (hPL). The pituitary gland secretes high levels of prolactin, the primary hormone responsible for stimulating milk synthesis

(lactogenesis). However, despite these high prolactin levels, active milk secretion is held in check throughout pregnancy. This inhibition is primarily caused by the very high circulating levels of estrogen and progesterone, which are produced by the placenta. These steroid hormones act on the breast tissue to block the binding of prolactin to its receptors on the alveolar cells, thereby hindering its lactogenic effect. After delivery, the abrupt withdrawal of estrogen and progesterone following the expulsion of the placenta removes this inhibition, allowing prolactin to act unopposed and initiate copious milk production.

Question 134. To which class does clear cell carcinoma of the ovary belong, in terms of ovarian tumors?

A. Epithelial cell tumor

B. Germ cell tumor

C. Sex cord stromal tumor

D. Granulosa cell tumor

Correct answer: A

Epithelial cell tumor Ovarian neoplasms are classified based on their cell of origin. The three main categories are epithelial tumors, germ cell tumors, and sex cord-stromal tumors. Epithelial cell tumors are the most common type, arising from the surface epithelium that covers the ovary. This category includes several major histological subtypes : serous, mucinous, endometrioid, clear cell, Brenner, and undifferentiated carcinomas. Therefore, clear cell carcinoma of the ovary is a subtype of epithelial ovarian cancer. It is often associated with endometriosis and can be part of the Lynch syndrome spectrum. Germ cell tumors (B) arise from primitive germ cells and include dysgerminoma and yolk sac tumors. Sex cord-stromal tumors (C) arise from the connective tissue of the ovary and include granulosa cell tumors (D) and Sertoli-Leydig cell tumors.

Question 135. Relative to pregnancy, which nutrient must be supplemented in greater amounts during lactation?

A. Vitamin A

B. Calcium

C. Iron

D. Folic acid

Correct answer: B

Calcium The nutritional requirements for several key nutrients are higher during lactation than during pregnancy to support the production of nutrient-rich breast milk. While needs for nutrients like Vitamin A (A) are increased, the most significant difference is for calcium. A lactating woman secretes a substantial amount of calcium into her breast milk (approximately 200-300 mg per day) to support the infant's bone development. To meet this demand without depleting her own bone stores, the recommended dietary allowance for calcium is higher during

lactation. In contrast, the requirement for iron (C) is actually lower during exclusive lactation than during pregnancy. This is because menstruation has not yet returned (lactational amenorrhea), so the woman is not losing iron through menstrual blood. Similarly, the need for folic acid (D) is highest in the periconceptional period and first trimester of pregnancy to prevent neural tube defects.

Question 136. Asherman syndrome is most commonly associated with:

A. Oligomenorrhea

B. Hypomenorrhea

C. Dysmenorrhea

D. Menorrhagia

Correct answer: B

Hypomenorrhea Asherman's syndrome is an acquired uterine condition characterized by the formation of intrauterine adhesions or scar tissue. The most common cause is trauma to the basal layer of the endometrium, typically from a vigorous dilatation and curettage (D&C), often postpartum or post-abortion. These adhesions can obliterate the endometrial cavity to varying degrees. The most common clinical presentation is a change in the menstrual pattern. Since the amount of functional endometrial tissue is reduced, the menstrual flow becomes scanty or very light. This is known as hypomenorrhea. In severe cases, the scarring can completely obstruct the cavity, leading to secondary amenorrhea (complete absence of periods). Dysmenorrhea (C) can also occur. Menorrhagia (D), or heavy bleeding, is the opposite of what is seen. Oligomenorrhea (A) refers to infrequent cycles.

Question 137. Which of the following methods is not considered a form of long-acting reversible contraception (LARC)?

A. Copper T

B. Implanon

C. Laparoscopic tubal ligation

D. Combined oral contraceptives

Correct answer: C

Laparoscopic tubal ligation Long-Acting Reversible Contraceptives (LARCs) are methods of birth control that provide effective contraception for an extended period without requiring user action. They are also fully reversible upon removal. The Copper T (A) (an IUD) and Implanon (B) (a subdermal progestin implant) are classic examples of LARCs, providing protection for up to 10 and 3 years, respectively. In contrast, laparoscopic tubal ligation (C) is a form of permanent sterilization. While reversal surgery is sometimes possible, it is not always successful, and the procedure is intended to be irreversible. Combined oral contraceptives (D) are a short-acting method, not long-acting, as they require daily user action. The question contains a slight ambiguity as both C and D are not LARCs, but for different reasons. However, tubal ligation is

the definitive non-reversible method listed.

Question 138. What initial treatment options are suitable for a teenage girl who presents with irregular menstrual cycles, excessive facial hair, and enlarged ovaries? 1. Laparoscopic ovarian drilling 2. Anti-androgens 3. Lifestyle modifications 4. Combined oral contraceptive pills.

A. 1,2,3

B. 2,3,4

C. 1,3,4

D. 1,2,4

Correct answer: B

2,3,4 The patient's symptoms—oligomenorrhea (irregular cycles), hirsutism (excessive hair growth), and polycystic ovaries—are characteristic of Polycystic Ovary Syndrome (PCOS). The initial management focuses on the patient's primary concerns. For a teenager not seeking fertility, the goals are to regulate the menstrual cycle and manage the symptoms of hyperandrogenism. The cornerstone of initial management is lifestyle modification (3), including diet, exercise, and weight management, which can improve hormonal balance. For cycle regulation and to suppress androgen production, low-dose combined oral contraceptive pills (OCPs) (4) are the first-line medical therapy. For persistent hirsutism despite OCPs, an anti-androgen medication like spironolactone (2) can be added. Laparoscopic ovarian drilling (1) is a surgical option for ovulation induction in infertile women with PCOS who are resistant to clomiphene citrate; it is not an initial treatment option for a teenager. DERMATOLOGY

Question 139. A young woman presents with facial symptoms as shown. Which of the following treatments is appropriate?

A. Blighted ovum

B. Missed abortion

C. Ectopic pregnancy

D. Hydatidiform mole

Correct answer: D

Hydatidiform mole This clinical picture is classic for a hydatidiform mole, a form of gestational trophoblastic disease. The key findings are vaginal bleeding or spotting in the first trimester, a uterine size that is larger than the expected gestational age, and often markedly elevated serum hCG levels. The ultrasound image provided is diagnostic, showing a heterogeneous mass with multiple anechoic cystic spaces filling the uterine cavity, without evidence of a fetus or a normal gestational sac. This is the characteristic "snowstorm" appearance of a complete hydatidiform mole, which is caused by the hydropic swelling of the chorionic villi. A blighted ovum (A) or missed abortion (B) would typically present with a uterine size smaller than expected for the gestational age. An ectopic pregnancy (C) involves an extrauterine gestation

with an empty uterus.

Question 140. How do local anesthetics exert their mechanism of action?

A. Block sodium channels

B. Block potassium channels

C. Block calcium channels

D. Block chloride channels

Correct answer: A

Block sodium channels Local anesthetics are drugs that produce a transient and reversible loss of sensation, particularly pain, in a localized area of the body. Their primary mechanism of action is the blockade of voltage-gated sodium channels in the nerve cell membrane. A nerve impulse, or action potential, is generated and propagated by the rapid influx of sodium ions through these channels, which causes depolarization of the nerve membrane. Local anesthetics bind to a specific receptor site within the pore of the voltage-gated sodium channel. This binding physically obstructs the channel, preventing the influx of sodium ions. By blocking this crucial step, local anesthetics prevent the nerve from reaching the threshold for depolarization, thereby blocking the generation and conduction of action potentials. This interruption of nerve impulse transmission is what produces the anesthetic effect. RADIOLOGY

Question 141. What are the side effects of pituitary irradiation?

A. Hypopituitarism

B. Increased risk of cerebrovascular accident

C. Optic nerve damage

D. All of the above

Correct answer: D

All of the above Radiation therapy to the pituitary region, used for tumors like pituitary adenomas, can have several significant long-term side effects due to radiation damage to the gland and surrounding structures. (A) Hypopituitarism : Radiation can cause delayed damage to the normal hormone-producing cells of the pituitary gland, leading to deficiencies in one or more pituitary hormones. This is the most common late complication. (C) Optic nerve damage : The optic nerves and chiasm are located in very close proximity to the pituitary gland. They are highly sensitive to radiation, and damage can lead to a progressive and irreversible loss of vision, known as radiation-induced optic neuropathy. (B) Increased risk of cerebrovascular accident : Radiation can induce vasculopathy in the large arteries at the base of the brain (e.g., the internal carotid arteries), leading to stenosis or occlusion and a significantly increased long-term risk of stroke. Since all these are well-documented and serious potential side effects, the correct answer is all of the above.

Question 142. Match the following diagnostic tools with their corresponding

conditions: Hirschsprung's disease MRCP Posterior urethral valve CT scan Choledochal cyst Rectal biopsy Intussusception Micturating cysto- urethrogram

A. 1-c, 2-d, 3-b, 4-a

B. 1-a, 2-d, 3-b, 4-c

C. 1-c, 2-d, 3-a, 4-b

D. 1-d, 2-c, 3-a, 4-b

Correct answer: C

1-c, 2-d, 3-a, 4-b 1. Hirschsprung's disease : This is a congenital condition characterized by the absence of ganglion cells in the distal colon. The gold standard for definitive diagnosis is a rectal biopsy (c) to demonstrate the absence of these ganglion cells. 2. Posterior urethral valve : This is a congenital obstruction in the male urethra. The diagnostic imaging study of choice is a micturating cystourethrogram (MCUG) or voiding cystourethrogram (VCUG) (d), which will demonstrate the dilated posterior urethra and the valves themselves. 3. Choledochal cyst : This is a congenital cystic dilatation of the biliary tree. The best non-invasive imaging modality to visualize the biliary anatomy and confirm the diagnosis is Magnetic Resonance Cholangiopancreatography (MRCP) (a). 4. Intussusception : This is the telescoping of one bowel segment into another. While ultrasound is often the initial diagnostic tool, a CT scan (b) can also be used, showing a characteristic "target" or "sausage" sign.

Question 143. What is the length of time for which short-term memory lasts?

A. 3-6 Hours

B. 12-18 Hours

C. 30-300 Seconds

D. 3-4 Seconds

Correct answer: C

30-300 Seconds Short-term memory (STM) refers to the temporary storage of information for a brief period before it is either forgotten or consolidated into long-term memory. It typically lasts from about 30 seconds to 5 minutes (300 seconds) in the absence of rehearsal. Short-term memory has a limited capacity, often described by Miller’s law as 7 ± 2 items, although more recent research suggests it may be closer to 4–7 items. Information in short-term memory can be maintained longer through active rehearsal (repeating the information mentally). In contrast : 1. Sensory memory lasts only a few seconds (about 1–3 seconds). 2. Working memory is closely related to short-term memory but includes active processing. 3. Long-term memory can last from hours to a lifetime. Thus, the typical duration of short-term memory is 30–300 seconds, making option (C) correct.

Question 144. What is the best treatment for a patient who repeatedly feels their hands are contaminated and compulsively washes them, causing significant distress and reduced functioning?

A. DBT

B. Exposure and Response Prevention

C. Systematic Desensitization

D. CBT

Correct answer: B

Exposure and Response Prevention The patient's symptoms—recurrent, intrusive thoughts about contamination (obsessions) and repetitive hand-washing rituals (compulsions)—are the classic presentation of Obsessive-Compulsive Disorder (OCD). The gold standard and most effective form of psychotherapy for OCD is a specific type of Cognitive-Behavioral Therapy (CBT) known as Exposure and Response Prevention (ERP). In ERP, the patient is gradually and systematically exposed to the situations, objects, or thoughts that trigger their obsessions (e.g., touching a "contaminated" object). They are then coached to resist and refrain from performing their compulsive ritual (the response prevention part, e.g., not washing their hands). Through this process, the patient learns that their anxiety will decrease over time without the need for the ritual, leading to the habituation of the fear response and a significant reduction in symptoms. While ERP is a form of CBT (D), it is the most specific and correct answer.

Question 145. According to ICD-11, which of the following conditions is not classified under obsessive– compulsive disorders?

A. Trichotillomania

B. Body dysmorphic disorder

C. Hypochondriac disorder

D. PTSD

Correct answer: D

PTSD The ICD-11 (and DSM-5) created a new chapter for "Obsessive-Compulsive and Related Disorders." This category groups together a set of disorders that share features of repetitive thoughts and/or behaviors. This chapter includes Obsessive-Compulsive Disorder (OCD) itself, as well as Body Dysmorphic Disorder (B) (preoccupation with perceived flaws in appearance), Trichotillomania (A) (hair-pulling disorder), hoarding disorder, and excoriation (skin-picking) disorder. Hypochondriasis (illness anxiety disorder) (C) is also included in this chapter. In contrast, Post-Traumatic Stress Disorder (PTSD) (D) is classified under a completely different chapter called "Disorders specifically associated with stress." While it involves intrusive thoughts (re-experiencing the trauma), its etiology and core features are distinct from those of the OCD-related disorders, as it is directly linked to a traumatic event.

Question 146. Which of the following is not an off-label indication for the use of risperidone?

A. OCD (Obsessive-Compulsive Disorder)

B. Dementia

C. PTSD (Post-Traumatic Stress Disorder)

D. Bipolar disorder

Correct answer: D

Bipolar disorder "Off-label" use refers to prescribing a drug for a condition for which it has not received official approval from a regulatory body like the FDA. Risperidone is an atypical antipsychotic. Its FDA-approved indications include schizophrenia, acute manic or mixed episodes associated with bipolar I disorder (either as mono therapy or as an adjunct to lithium or valproate), and irritability associated with autistic disorder. Therefore, its use in bipolar disorder is an approved, on-label use. In contrast, while risperidone is sometimes used to augment SSRIs in treatment-resistant OCD (A), to manage agitation in dementia (B), or to treat symptoms of PTSD (C), these are all considered off-label uses. The only on-label indication among the choices for this specific drug is bipolar disorder. **********