

FMGE Jan 2024 Questions with Answers

Anaesthesia

Q. Which of the following is the use of the Mallampatti classification?

- A. Endotracheal intubation
- B. To evaluate the risk of surgery
- C. To evaluate the pros and cons of surgery
- D. To evaluate the fitness of the patient

 **Correct Answer: 1**

 **Solution:**

Correct Option: A) Endotracheal Intubation The Mallampatti classification is primarily used to assess the difficulty of endotracheal intubation. It evaluates the visibility of anatomical structures in the oral cavity to predict the ease or difficulty of securing the airway.

Mallampati Airway Classification Mallampati Classification: (Mnemonic - PUSH - Pillars, Uvula, Soft palate, Hard palate) Class I: Faucial pillars, uvula, soft palate, and hard palate are visualized. Class II: The base of the uvula, soft palate, and hard palate are visualized. Class III: Soft palate and hard palate are visualized. Class IV: Hard palate only is visualized. Class 0: Any part of the epiglottis is visible (easy laryngoscopy with difficult airway management) Incorrect Options: Options B, C, and D: The Mallampati classification is not used to evaluate the overall risk associated with surgery and does not provide insights into the pros and cons of surgical procedures. It does not assess a patient's general fitness for surgery.

Q. Which of the following is the most common drug used in day care surgery/TIVA?

- A. Sodium thiopentone
- B. Propofol
- C. Halothane
- D. Ketamine

 **Correct Answer: 2**

 **Solution:**

Correct Answer: B) Propofol Propofol is the preferred choice for daycare surgery and Total Intravenous Anesthesia (TIVA) due to its rapid onset and quick recovery profile.

Additionally, Propofol is associated with a lower incidence of postoperative nausea and vomiting (PONV) Propofol Appearance: Clear, white emulsion, available as a 1% aqueous preparation (10 mg/mL) for IV administration. Composition of Propofol Chemical structure: phenol ring with two isopropyl groups. Solubility: not water-soluble; available as a 1%

aqueous oil-in-water emulsion. Emulsion ingredients: contains soybean oil, glycerol, and egg lecithin. Storage requirements: this should be administered within 6 hours of opening due to the risk of bacterial contamination, and a strict sterile technique is required. 0.005% disodium edetate or 0.025% sodium metabisulfite helps slow bacterial growth. Pharmacokinetics of Propofol Administration Route: only available for intravenous use. Onset of Action: rapid onset; effects typically observed for 2–8 minutes after administration. Distribution: short initial distribution half-life leads to quick awakening. Recovery: faster recovery compared to other anesthetics, minimal “hangover” effects. Biotransformation: high clearance exceeding hepatic blood flow (possible extrahepatic metabolism); metabolism occurs in the liver, resulting in inactive metabolites. Excretion: Primarily eliminated via urine; unaffected by end-stage kidney disease. Clinical Uses Induction of Anesthesia: Suitable for patients aged 3 years and older; can be used in younger children with IV access. Maintenance of Anesthesia: For patients over 2 months old. Sedation: During monitored anesthesia for various procedures. For intubated, mechanically ventilated ICU patients. Off-Label Uses Management of refractory status epilepticus in both children and adults. Treatment of refractory postoperative nausea and vomiting. Incorrect Options: Options A, C and D are less commonly chosen for daycare surgeries

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

- A. Proparacaine 0.5%
- B. Bupivacaine 0.5%
- C. Halothane
- D. Nitrous Oxide

 **Correct Answer: 1**

 **Solution:**

Correct Option: A) Proparacaine 0.5% Explanation: Proparacaine 0.5% is the most frequently used topical local anesthetic for cataract surgery due to its effectiveness in providing adequate anesthesia with minimal systemic effects. It is preferred for its rapid onset and relatively short duration of action, which is well-suited for the brief nature of cataract procedures. Incorrect Options: Bupivacaine (Option B): Bupivacaine is more commonly used for spinal, epidural, and peripheral nerve blocks. Halothane and Nitrous (Oxide Option C and D) are inhalational anesthetic agents used for general anesthesia, not topical local anesthesia.

Q. Which of the following is the mechanism of action of Local anesthetics?

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

✓ **Correct Answer: 1**

🧠 Solution:

Correct Answer: A) Blocks Na⁺ channels Explanation: Local anesthetics work by blocking sodium channels in nerve membranes, preventing the propagation of nerve impulses, which results in local anesthesia. MOA: Blocks inactivation gates of Na⁺ channels & rarr; Disrupts depolarisation & rarr; No action potential generated & rarr; No pain sensation. Incorrect Options: Stimulate Ca⁺ Channels (Option A): Calcium channels are involved in neurotransmitter release at synapses, but local anesthetics do not stimulate Ca²⁺ channels. They primarily block sodium channels. Block Cl⁻ Channels (Option B): Chloride channels play a role in the regulation of cell volume and maintaining membrane potential, but local anesthetics do not block chloride channels. Stimulate K⁺ channels (Option C): Potassium channels are involved in the repolarization phase of the action potential, but local anesthetics do not directly stimulate these channels. Their primary effect is on sodium channels to block nerve conduction.

Subject: Anatomy

Q. Identify the muscle that is defective in the given image.

- A. Gluteus medius and Gluteus minimus
- B. Gluteus maximus
- C. Piriformis
- D. Obturator internus

✓ **Correct Answer: 1**

🧠 Solution:

Correct Answer: A) Gluteus medius and Gluteus minimus Explanation: The Gluteus medius and Gluteus minimus are responsible for the abduction and medial rotation of the thigh and are innervated by the superior gluteal nerve. A positive Trendelenburg test, which is indicated by a drop in the pelvic alignment when standing on one leg, is characteristic of a defect in these muscles. (as shown in the image) This condition suggests a superior gluteal nerve injury, which results in a lurching motion towards the side of the lesion.

A surgical procedure is performed on the great saphenous vein, around 2.5 cm anterior to the medial malleolus. Which of the following structures is most likely to be injured?

- A. Saphenous nerve
- B. Sural nerve
- C. Deep peroneal nerve
- D. Tibial nerve

✓ **Correct Answer: 1**

 Solution:

Correct Answer: A) Saphenous nerve Explanation: The great saphenous vein passes anterior to the medial malleolus and is closely associated with the saphenous nerve; therefore, it is more prone to injury during this procedure. Great Saphenous Vein Origin: Begins at the medial end of the dorsal venous arch. Course: Ascends 2.5 cm in front of the medial malleolus, along the medial aspect of the tibia with the saphenous nerve. Passes posterior to the medial condyles of the tibia and femur. Runs posterior to the patella and ascends along the medial side of the femur. Pierces the cribriform fascia and passes through the saphenous opening. Drains into the femoral vein after piercing the femoral sheath. Clinical Aspects Venesection: Performed at the ankle in emergencies. Care must be taken to avoid damaging the saphenous nerve (as it accompanies the vein). Coronary Bypass Surgery: Commonly used as a graft for bypass surgery. The vein must be reversed to prevent its valves from obstructing blood flow in the graft.

Q. In the given image, the physician is trying to palpate which of the following arteries?

- A. Anterior tibial artery
- B. Posterior tibial artery
- C. Dorsalis pedis artery
- D. Lateral plantar artery

 **Correct Answer: 2**

 Solution:

Correct Answer: B) Posterior tibial artery Explanation: The posterior tibial artery is present in the posterior aspect of the leg and, runs posterior to the tibia, and supplies the calf region. Arrangement of Structures Under the Flexor Retinaculum (Medial to Lateral) Mnemonic: Tom Dick ANd Harry T: Tibialis posterior D: Flexor Digitorum longus A: Posterior tibial Artery N: Tibial Nerve H: Flexor Hallucis longus Anterior tibial artery (Option A): Anterior tibial artery is present in the anterior aspect of the leg. Dorsalis pedis artery (Option C): The anterior tibial artery continuous as the dorsalis pedis artery Lateral plantar artery (Option D): The posterior tibial artery passes under the flexor retinaculum on the medial side of the ankle and divides into the medial and lateral plantar arteries to supply the sole.

Q. Which of the following structures develop from the 6th pharyngeal arch artery on the left side?

- A. Arch of Aorta
- B. Ductus arteriosus
- C. Carotid arteries
- D. Subclavian artery

✓ **Correct Answer: 4**

🧠 Solution:

Correct Answer: D) Subclavian artery Explanation: The 6th pharyngeal arch artery on the left side specifically develops into the ductus arteriosus and a portion of the right and left pulmonary arteries. Pharyngeal Arch Artery of Arch First Maxillary artery Second Hyoid artery, Stapedial artery Third Common carotid artery, Internal carotid artery Fourth Arch of aorta (left side), Subclavian artery (right side) Sixth Ductus arteriosus (left side), Pulmonary artery (right side)

Q. Which of the following is the type of joint between epiphysis and diaphysis of a long bone?

- A. Symphysis
- B. Synchrondrosis
- C. Synostosis
- D. Syndesmosis

✓ **Correct Answer: 2**

🧠 Solution:

Correct Answer: B) Synchrondrosis Explanation: Synchrondrosis is a type of joint that is a primary cartilaginous joint where the epiphysis and diaphysis of a long bone are connected by a growth plate made of hyaline cartilage. Primary Cartilaginous Joints (Synchrondrosis) Secondary Cartilaginous Joints (Symphysis) (Option A) Immobile Occur where ossification centres remain separated by hyaline cartilage. Found in bones that form from more than one ossification centre. Hyaline cartilage here can ossify with age, leading to fusion when growth is completed. Temporary and mainly for growth. Mostly associated with growth plates. The joint between the first rib and the manubrium is a permanent synchrondrosis. Slightly mobile Defined by a pad or disc of fibrocartilage between articulating bones, e.g., intervertebral discs. Built to handle a variety of stresses (compression, tension, etc.). Permanent and provide limited movement. Found along the midline (e.g., pubic symphysis, intervertebral joints). Strong ligaments reinforce the joints and are key to stability and movement. Symphyses are built for durability and movement, but they also allow growth in areas like the intervertebral discs. Synostosis (Option C): Synostosis refers to the fusion of bones where the original cartilage is replaced entirely by bone. Syndesmosis (Option D): A syndesmosis is a fibrous joint where bones are connected by a ligament or an interosseous membrane, allowing for limited movement.

Q. Which of the following nerves supplies the muscle that is involved in the moment given below?

- A. Spinal accessory nerve

- B. Long thoracic nerve
- C. Spinal branch of axillary nerve
- D. Radial nerve

✓ **Correct Answer: 1**

🧠 **Solution:**

Correct Answer: A) Spinal accessory nerve Explanation: The movement shown in the image is shrugging, which is carried out by the trapezius muscles and supplied by the spinal accessory nerve. Lesion of the accessory nerve or paralysis of the trapezius leads to drooping of shoulders and difficulty in shrugging and weakness of overhead abduction. Trapezius Origin: Occipital bone and cervicothoracic spine Insertion: Scapula Bone and Clavicle Three sets of fiber: Upper: Insertion on clavicle (lateral 1/3 posterior side) Middle: Insertion on acromion process anteriorly Lower: Insertion on the spine of the scapula Nerve Supply: Accessory nerve (CN XI) Action: Elevation (upper fiber) and depression (lower fiber) Retractor (Midline) Rotates the Glenoid cavity superiorly. Long thoracic nerve (Option B): Supplies serratus anterior, which is responsible for scapular protraction (not related to the given movement). Spinal branch of axillary nerve (Option C): Supplies deltoid and teres minor, involved in shoulder abduction and lateral rotation. Radial nerve (Option D): Innervates triceps, wrist extensors, and is involved in elbow extension and wrist extension. Biochemistry

Q. Zellweger syndrome is associated with which cellular organelle?

- A. Peroxisomes
- B. Nucleosomes
- C. Lysosomes
- D. Ribosomes

✓ **Correct Answer: 1**

🧠 **Solution:**

Correct Answer: A) Peroxisomes Explanation Zellweger syndrome is a peroxisomal biogenesis disorder caused by mutations in PEX genes. It results in defective peroxisome formation, leading to an inability to metabolize very long-chain fatty acids (VLCFAs) and plasmalogens. Clinical features include hypotonia, seizures, hepatomegaly, and craniofacial abnormalities. Zellweger Spectrum Disorder Rare autosomal recessive disorder with defective peroxisome biogenesis affecting VLCFA metabolism. Includes Zellweger syndrome, neonatal adrenoleukodystrophy, infantile Refsum disease, and rhizomelic chondrodysplasia punctata. Etiology Caused by mutations in PEX genes encoding peroxins, primarily PEX1/PEX6 Functional peroxisomal disturbances: Zellweger spectrum: Generalized peroxisomal dysfunction. Adrenoleukodystrophy: Mutations in ABCD1, impacting VLCFA transport. Rhizomelic chondrodysplasia punctata: Multiple enzymatic defects.

Pathophysiology Peroxisomes: Membrane-bound organelles with >50 enzymes for fatty acid metabolism, abundant in liver/kidney. Mutated PEX genes disrupt peroxisome formation, leading to VLCFA accumulation, reduced steroid biosynthesis, and neuronal damage. Major abnormalities: Brain: Demyelination, neuronal injury. Liver: Fibrosis. Kidney: Cortical cysts. Clinical Features Multisystem involvement with severity depending on age of onset: Neonatal-Infantile: Hypotonia, feeding issues, seizures, facial dysmorphism, ocular and hearing abnormalities, hepatomegaly. Childhood: Developmental delay, FTT, hepatic dysfunction, adrenal insufficiency, neuroregression. Adolescent-Adult: Neuroregression, ataxia, neuropathy, adrenal insufficiency, leukodystrophy. Diagnosis Initial: Clinical features + elevated VLCFA on newborn screening. Biochemical tests: Elevated VLCFA, bile acid intermediates, and phytanic/pristanic acid; reduced plasmalogens. Genetic testing: Confirms PEX mutations. Prenatal diagnosis and genetic counseling recommended. Management No cure; supportive care focuses on improving quality of life. Therapies: Docosahexaenoic acid Lorenzo oil: Reduces VLCFA but doesn't halt disease progression. Cholic acid: Approved for hepatic dysfunction. Supportive Measures: Hearing aids for hearing loss. Ophthalmologic care for vision issues. Antiepileptics for seizures. Vitamin supplementation: Fat-soluble vitamins (A, D, E, K). Cortisone for adrenal insufficiency. Gastrostomy for feeding difficulties. Nucleosomes (Option B): Disorders involving nucleosomes are linked to chromatin remodeling or epigenetic regulation, not Zellweger syndrome. Lysosomes (Option C): Lysosomal storage diseases (e.g., Tay-Sachs disease, Gaucher disease) result from enzyme deficiencies affecting lysosomal function. Zellweger syndrome does not involve lysosomes. Ribosomes (Option D): Diseases involving ribosomes include ribosomopathies like Diamond-Blackfan anemia, which are unrelated to Zellweger syndrome.

Q. A 3-month-old baby presents with severe hepatomegaly, cataracts in both eyes, lethargy, and hypotonia. Based on these symptoms, which enzyme deficiency is most likely involved?

- A. Galactokinase
- B. Hepatic Kinase
- C. Hepatic Glucose-6-Phosphatase
- D. Galactose-1-Phosphate Uridyl Transferase

 **Correct Answer: 4**

 **Solution:**

Correct Answer: D) Galactose-1-Phosphate Uridyl Transferase Explanation

Galactose-1-Phosphate Uridyl Transferase deficiency causes classic galactosemia, a severe metabolic disorder characterized by hepatomegaly, cataracts, lethargy, and hypotonia due to the accumulation of toxic metabolites like galactose-1-phosphate and galactitol.

Galactosemia Enzyme Deficiency Galactose-1-phosphate uridylyltransferase (GALT) - Classical type Galactokinase- benign disease with only oil drop cataract. (Option A ruled out)

Epimerase- SNHL + symptoms of classical type (Low galactose-based diet can be given which is contraindicated in the classical type) Pathophysiology Accumulation of galactose-1-phosphate (toxic causing jaundice, and liver damage) Inability to metabolize galactose from milk Damage to liver, kidney, and brain Clinical Features Hepatic: Jaundice, hepatomegaly GI: Vomiting, diarrhea, failure to thrive CNS: Seizures, intellectual disability Eyes: Oil drop cataracts Increased risk of E. coli sepsis Diagnosis Reducing substance in urine (positive) (Positive Benedict test but negative glucose oxidase test) Direct enzyme (GALT) assay Genetic testing (Perinatal diagnosis is possible) Management Lactose-free diet Breast Milk contraindicated Soy-based or elemental formulas Calcium supplementation Hepatic Glucose-6-Phosphatase (Option C): Deficiency of it causes glycogen storage disease type I (Von Gierke disease), which presents with hepatomegaly, hypoglycemia, and lactic acidosis. Cataracts are not a feature of this condition.

Subject: Dermatology

Q. A child with a sore throat starts developing skin lesions as in the image below. Which of the following is the diagnosis?

- A. Guttate psoriasis
- B. Pustular psoriasis
- C. Erythrodermic
- D. Inverse psoriasis

 **Correct Answer: 1**

 **Solution:**

Correct Answer: A) Guttate psoriasis Explanation: The image given above is of Guttate psoriasis It is commonly seen in children. It is usually preceded by streptococcal infection Small, erythematous, scaly plaques on the trunk which gives raindrop-like appearance are seen Treatment: Antibiotics (penicillin, amoxicillin) Pustular Psoriasis (Option B): Pustular psoriasis (a type of unstable psoriasis) characterized by the presence of multiple sterile, non-infectious pus-filled blisters on erythematous skin, forming a characteristic ‘Lakes of pus’ appearance. `{{caption_text}}` Erythrodermic Psoriasis (Option C): It is another variant of unstable psoriasis that presents with erythema and scales covering more than 90% of the body surface. `{{caption_text}}` Inverse Psoriasis (Option D): Affects intertriginous areas (axilla, groin, inframammary folds) and presents with shiny, erythematous plaques without scaling, unlike guttate psoriasis. `{{caption_text}}`

Q. A female patient presents to the OPD with complaints of recurrent lesions on lips as shown below, which is associated with fever. Which of the following is the characteristic feature seen in Tzanck smear?

- A. Handerson patterson bodies

- B. Multinucleated giant cells
- C. Owl eye appearance
- D. Acantholytic cells

 **Correct Answer: 2**

 **Solution:**

Correct Answer: B) Multinucleated giant cells Explanation: The image given in the question is of Herpes labialis which is caused by Herpes simplex virus. Fever is one of the predisposing factor of Herpes labialis It is also called cold sore. It is usually present on the vermillion border of the lips. Smear is taken from the base of the vesicle Multinucleated giant cells and Acantholytic cells are present on Tzanck smear Herpes labialis/cold sore: Reactivation of latent infection in trigeminal ganglion, causing asymptomatic shedding or clinically evident recurrent disease. Causative organism: HSV-1 & HSV-2. Features: Painful and pruritic lesions. Fever is often present, which subsides in 3-5 days. The initial vesicular lesions become pustular and then crusted before healing in 7-10 days without scarring. Can be associated with itching or burning before the development of lesions. Recurrent herpetic lesions are vesicular and ulcerative and tend to occur in the same region. Treatment: First line Acyclovir (topical/oral) Hydrocolloid dressing Topical penciclovir Second line Long-term prophylactic acyclovir Third line IV acyclovir Penciclovir Foscarnet IV cidofovir Topical imiquimod Handerson patterson bodies (Option A): Handerson patterson bodies is a histologic finding seen in Molluscum contagiosum. Owl eye appearance (Option C): refers to basophilic intranuclear inclusions surrounded by a clear halo, characteristic of Cytomegalovirus (CMV) infection. Acanthosis (Option D): Acanthosis is a histopathological finding seen in Chronic eczema.

Subject: ENT

A patient with a history of trauma presents with hearing loss. A High-Resolution Computed Tomography (HRCT) scan was performed. Which of the following structures is not typically visualized on HRCT?

- A. Cochlea
- B. Vestibule
- C. Semicircular canal
- D. Organ of Corti

 **Correct Answer: 4**

 **Solution:**

Correct Option: D) Organ of Corti Explanation: HRCT of temporal bone is a specialized

imaging technique used to obtain detailed images of the bones and air-filled spaces within the ear. The organ of Corti is a neurosensory epithelium responsible for hearing present on the basilar membrane in scala media and it is difficult to identify it on HRCT. Incorrect Options: Options A, B & C: The cochlea, Vestibule, and Semicircular canals are bony structures and can be visualized on HRCT.

What is the most commonly used test for newborn hearing screening?

- A. Otoacoustic Emissions (OAE)
- B. Brainstem Evoked Response Audiometry (BERA)
- C. Pure Tone Audiometry (PTA)
- D. Tympanometry

 **Correct Answer: 1**

 **Solution:**

Correct Option: A) Otoacoustic emissions (OAE) Explanation: OAE is the best and most commonly used test for newborn hearing screening. Brainstem Evoked Response Audiometry (BERA) is used to confirm hearing loss in infants and only in neonates who have failed OAE. Uses of OAE: They are used as a screening test for neonates, uncooperative or mentally challenged individuals. Differentiate between cochlear and retrocochlear hearing loss. Helpful in early detection of noise-induced hearing loss. Incorrect Options: Options B, C & D: Brainstem Evoked Response Audiometry (BERA), Pure Tone Audiometry (PTA), and Tympanometry are not the most commonly used tests for newborn hearing screening.

Q. Which structure is most commonly involved in the compression of the anterior ethmoid nerve, leading to Sluder's neuralgia?

- A. Superior turbinate
- B. Middle turbinate
- C. Inferior turbinate
- D. Nasal septum

 **Correct Answer: 2**

 **Solution:**

Correct Option: B) Middle turbinate Explanation: Middle turbinate, more than the inferior turbinate, is the most commonly involved structure in the compression of the anterior ethmoid nerve leading to anterior ethmoid neuralgia (Sluder's neuralgia). Incorrect Options: Options A, C & D: Superior turbinate, inferior turbinate, and nasal septum are not the most commonly involved structures in the compression of anterior ethmoid nerve.

Subject: Forensic Medicine

Q. During measurement of a rifled barrel weapon, the caliber depends on?

- A. Distance between two opposite lands
- B. Distance between two opposite grooves
- C. Number of lead pellets
- D. Mass and velocity

 **Correct Answer: 1**

 Solution:

Correct Option: A) Distance between two opposite lands Explanation: In forensic ballistics, "caliber" refers to the diameter of a rifled firearm's barrel, specifically measured between opposing lands. This measurement, typically expressed in inches or millimetres, is crucial for linking a bullet to a specific firearm. Rifled Firearms: Rifled firearms have a bore characterised by a series of grooves that spiral along the barrel's length. These grooves (Option B), known as "rifling," alternate with raised areas called "lands." The caliber is determined by measuring the distance between these lands. (Option A) The direction of rifling can be either right (clockwise) or left (counter-clockwise), with most handguns featuring a right-hand twist. As the bullet travels through the barrel, it engages with the lands and grooves, imparting a spin that stabilises its flight and leaves distinctive markings on the bullet, which serve as identifiers for the firearm. Number of lead pellets (Option C) Bore or Gauge: It is used for smooth bore weapons. The number of balls/pellets of equal size/weight made from 1 pound lead (454g) 12 bore = 12 balls Mass and velocity (Option D) of a projectile fired from a rifled barrel weapon are important factors in its performance, they are not used directly to determine the caliber of the weapon

Q. During the forensic examination of semen from a rape victim, the identification of distinctive yellow needle-like crystals raises attention. What is the specific test employed to ascertain the presence of sperm?

- A. Barberio test
- B. Acid phosphatase test
- C. Papanicolaou smear
- D. Florence test

 **Correct Answer: 1**

 Solution:

Correct Option: A) Barberio test Explanation: Barberio test, indicated by the presence of yellow needle-shaped crystals, is used to identify the seminal fluid in this condition. The Barberio test specifically detects Spermine, a compound derived from the prostate, and is used to identify seminal fluid. Test Name Substance Detected Result Reagent Used Mnemonic Notes Barberio Test Spermine Yellow needle-shaped crystals of Spermine Picrate Picric acid Barbar picks your hair with a needle Detects Spermine from the prostate; confirms the presence of seminal fluid. Florence Test Choline Dark brown rhombic crystals of Choline iodide KI (Potassium Iodide) Florence has 'C', C for Choline It detects choline from the seminal vesicle and is used to identify seminal fluid. Florence Test (Option D): This test detects choline and produces different crystal formations (dark brown rhombic crystals). Acid phosphatase test (Option B) can be used to detect seminal fluid, as acid phosphatase is present in high concentrations in semen. The test does not involve the formation of yellow needle-like crystals. Papanicolaou smear (Option C) commonly known as a Pap smear, is a screening test used to detect cervical cancer and abnormalities in cervical cells.

Subject: Gynaecology & Obstetrics

Q. For how long is exclusive breastfeeding recommended?

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

 **Correct Answer: 2**

 Solution:

Correct Answer: B) 6 months Explanation: The recommended duration for exclusive breastfeeding is 6 months. Exclusive Breastfeeding: Only breast milk for the first 6 months No additional food or drinks Exceptions: oral rehydration solutions, drops/syrups of vitamins, minerals, or medicines Provides optimal nutrition and health benefits to infant 3 months (Option A): While three months of exclusive breastfeeding provides some benefits, it is insufficient for optimal infant development. According to protocol, continuing exclusive breastfeeding for a full six months is recommended. Nine months (Option C): By nine months, infants should already be receiving complementary foods alongside breast milk. Exclusive breastfeeding at this stage would not meet the growing nutritional needs of the developing infant. Twelve months (Option D): Although breastfeeding can continue for 12 months or longer, exclusive breastfeeding should not extend beyond six month. At this stage, infants require additional nutrients from complementary foods while continuing to receive breast milk.

Q. Which of the following is the correct definition of postpartum pyrexia?

- A. After 24 hours, temperature ≥ 100.4 degrees Fahrenheit
- B. After 6 hours, temperature ≥ 100.4 degrees Fahrenheit
- C. After 3 hours, temperature ≥ 100.4 degrees Fahrenheit
- D. After 12 hours, temperature ≥ 100.4 degrees Fahrenheit

 **Correct Answer: 1**

 **Solution:**

Correct Answer: A) After 24 hours, temperature ≥ 100.4 degrees Fahrenheit Explanation: Postpartum pyrexia, also known as puerperal fever, occurs after delivery and has specific diagnostic criteria. Definition: Temperature $\geq 100.4^{\circ}\text{F}$ (38°C) Occurs between first to tenth day postpartum Must be present on at least two occasions First 24 hours postpartum are excluded Clinical Significance: Important marker for postpartum infections Requires careful monitoring and evaluation Early detection prevents serious complications Option B (After 6 hours), Option C (After 3 hours), and Option D (After 12 hours) are incorrect as the first 24 hours postpartum must be excluded when defining postpartum pyrexia.

Q. A 32-year-old woman presents with intermenstrual bleeding following the insertion of an intrauterine device (IUD). She reports no other complications. What is the most appropriate initial management step?

- A. Remove the IUD
- B. Reassure the patient and observe
- C. Perform a pelvic ultrasound
- D. Prescribe hormonal therapy

 **Correct Answer: 2**

 **Solution:**

Correct Answer: B) Reassure the patient and observe Explanation: Intermenstrual bleeding is a common side effect following IUD insertion. It occurs due to the body's adjustment to the device and can persist for a few cycles. Management includes: Reassurance and observation as the first-line approach Tranexamic acid or NSAIDs can be used during the first few cycles to manage bleeding if needed Remove the IUD (Option A): Removal is generally not necessary unless there are additional signs of complications such as severe pain, abnormal discharge, or evidence of infection. Perform a pelvic ultrasound (Option C): While ultrasound might be considered if there are additional symptoms or concerns, it is not

routinely needed solely for intermenstrual bleeding following IUD insertion. Prescribe hormonal therapy (Option D): Hormonal therapy is not the first-line treatment for intermenstrual bleeding after IUD insertion. The primary approach is to observe and manage symptoms conservatively unless there are indications for further intervention.

Subject: Medicine

Q.. A 46-year-old male presents to the outpatient department with a history of lower back pain and painful urination. Upon investigation, he is found to have normocytic normochromic anemia and hypercalcemia. Serum protein electrophoresis reveals an M-spike in the gamma region. Which of the following tests is most appropriate to confirm the diagnosis of multiple myeloma?

- A. Liver function test
- B. Bence Jones protein in urine
- C. Urine albumin-to-creatinine ratio (UACR) test
- D. Heat and acetic acid test

 **Correct Answer: 2**

 **Solution:**

Correct Answer: B) Bence Jones protein in urine Explanation: Clinical features of CRAB (hypercalcemia, renal dysfunction, anemia, and bone lesions), along with the presence of an Gamma region M spike in serum electrophoresis, point towards the diagnosis of Multiple myeloma. Investigations of Multiple myeloma: Hematological Analysis: It may reveal anemia; ESR is usually elevated. Rare cases of plasma cell leukemia with high plasma cell counts >2000 plasma cells/ μ L. Serum calcium and urea nitrogen may be elevated. Serum alkaline phosphatase is usually normal. Peripheral smear: Rouleaux formation A/G ratio: Decreased Increased level of β_2 microglobulin. Decreased albumin Renal function test: Increased serum creatinine and uric acid. Imaging: Chest and bone radiographs: Lytic lesions/diffuse osteopenia MRI: Extent of bone marrow infiltration and cord or root compression in patients with pain syndrome PET/CT: Assess bone damage, extramedullary sites of the disease Anion gap: $(\text{Na}^+ + \text{K}^+) - (\text{Cl}^- + \text{HCO}_3^-)$: Decreased Serum or urine electrophoresis: M spike Serum light chain assay: Increased Immunofixation: Detects subtypes of light chain. 24-hour urine specimen: Bence Jones protein (serum-free light chains) excretion Fat pad biopsy: To detect amyloid deposits Flow cytometry: CD 138+ (bone marrow plasma cells) FISH: Done to detect chromosomal abnormalities Chromosome 17 deletion and translocation leads to poor prognosis. Bone marrow biopsy: Plasmacytosis $>10\%$ Liver function test (Option A): While liver function tests may be abnormal in some patients with multiple myeloma, they are not specific or diagnostic for the condition. LFTs are more useful in assessing liver involvement or complications. Urine

albumin-to-creatinine ratio (Option C): This test assesses kidney function and proteinuria but is not specific for multiple myeloma. While renal function may be affected in myeloma, UACR doesn't detect the characteristic Bence Jones proteins. Heat and acetic acid test (Option D): This is an outdated test that is not used in modern diagnosis of multiple myeloma. Current diagnostic methods are more sensitive and specific.

Q. A young woman presents with recurrent headaches, easy bruising, and episodes of visual blurring. Her platelet count is elevated, while her red blood cell (RBC) and white blood cell (WBC) counts are normal. What is the most likely diagnosis?

- A. Essential Thrombocytosis
- B. Polycythemia Vera
- C. Chronic Myeloid Leukemia (CML)
- D. Acute Myeloid Leukemia (AML)

 **Correct Answer: 1**

 **Solution:**

Correct Answer: A) Essential Thrombocytosis
Explanation: The clinical manifestations indicate Essential Thrombocytosis, a myeloproliferative neoplasm characterized by an isolated elevation in platelet count. The patient presents with classic symptoms including headaches, easy bruising, and visual disturbances, along with the key diagnostic finding of elevated platelets with normal RBC and WBC counts. This condition results from abnormal proliferation of megakaryocytes in the bone marrow, leading to excessive platelet production.

Essential Thrombocytosis Definition
Clonal myeloproliferative disorder
Characterized by increased platelet production
Abnormal megakaryocyte proliferation

Genetics
JAK2 V617F mutation (50-60% of cases)
CALR mutations (type 1 and 2)
MPL mutations

Lab Findings
Platelet count $>450,000/\mu\text{L}$
Increased bone marrow megakaryocytes
Normal RBC and WBC Count

Clinical Features
Often asymptomatic
Thrombotic events (arterial & venous)
Erythromelalgia
Ocular migraines & visual disturbances
TIAs
Spontaneous bleeding & easy bruising

Diagnostic Criteria
Platelet count $>450,000/\mu\text{L}$
Bone marrow showing megakaryocyte proliferation
Not meeting WHO criteria for other myeloid neoplasms
Presence of JAK2, CALR, or MPL mutation

Complications
Thrombosis (major cause of morbidity)
Hemorrhage (especially with counts $>1\text{ million}/\mu\text{L}$)
Progression to myelofibrosis
Small risk of leukemic transformation

Treatment
Low-dose aspirin for thrombosis prevention
Hydroxyurea for high-risk patients
Anagrelide for cytoreduction
Plateletpheresis for severe cases

Polycythemia Vera (Option B)
presents with elevated levels of all three blood cell lines—RBCs, WBCs, and platelets. The normal RBC count in this case makes this diagnosis unlikely. Patients typically present with ruddy complexion, pruritus, and thrombotic complications.

Chronic Myeloid Leukemia (Option C)
typically shows elevation in granulocytes and often an increase in platelets as

well. The presence of normal WBC count makes CML an unlikely diagnosis, as it characteristically presents with marked leukocytosis. Acute Myeloid Leukemia (Option D) typically presents with abnormal levels of blood cells and can show varying counts of WBCs, RBCs, and platelets. The normal blood counts except for platelets make AML less likely, as it usually presents with cytopenias and blast cells in the peripheral blood.

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

- A. 24-hour urinary catecholamines
- B. Serum calcitonin levels
- C. Serum chromogranin A
- D. Urinary 5-hydroxyindoleacetic acid

 **Correct Answer: 4**

 **Solution:**

Correct Answer: D) Urinary 5-hydroxyindoleacetic acid Explanation: The clinical manifestations indicate that carcinoid tumors are neuroendocrine tumors that secrete serotonin, which is metabolized to 5-HIAA and excreted in urine. Diagnosis of Carcinoid Syndrome Diagnostic Method Details 5-HIAA Urine Test Primary diagnostic test 24-hour urine collection Measures serotonin metabolites Can be challenging if patient is consuming serotonin-rich foods (e.g., salmon, eggs) Somatostatin Scintigraphy Also known as OctreoScan Can confirm presence of somatostatin receptors Helps in tumor localization Used to predict response to somatostatin analogue therapy 68Ga-DOTATATE PET Scan More sensitive imaging technique Uses radioactive gallium-68 Helps predict response to treatment Particularly useful for NET imaging Chromogranin A Blood test biomarker Elevated in metastatic disease Should be interpreted with caution in patients with renal dysfunction, patients taking PPIs Not diagnostic alone, but helpful in monitoring Clinical Symptoms Flushing episodes (2-5 mins) Diarrhea Wheezing Heart valve problems Abdominal pain Telangiectasia 24-hour urinary catecholamines (Option A): This test is used to diagnose pheochromocytoma and other catecholamine-secreting tumors, not carcinoid tumors. Catecholamines are not characteristic of carcinoid syndrome. Serum calcitonin levels (Option B): This test is used to diagnose medullary thyroid carcinoma, which is a different type of neuroendocrine tumor. Calcitonin is unlikely to be elevated in carcinoid syndrome. Serum chromogranin A (Option C): While chromogranin A can be elevated in some neuroendocrine tumors, it is not specific for carcinoid tumors and is not the diagnostic test of choice. It may be used as a supplementary marker but not for primary diagnosis.

Subject: Microbiology

Q. Which of the following microorganisms is likely responsible for causing bilateral infiltrates in an HIV-positive patient?

- A. Cryptococcus
- B. Histoplasmosis
- C. Pneumocystis Jirovecii
- D. Aspergillus

 **Correct Answer: 3**

 **Solution:**

Correct Answer: C) Pneumocystis Jirovecii Explanation: In HIV-positive patients, particularly those with a weakened immune system (low CD4 count), Pneumocystis jirovecii is a common cause of bilateral infiltrates in the lungs, leading to Pneumocystis pneumonia (PCP). PCP is a fungal infection that often presents with symptoms like shortness of breath, cough, and fever, and it typically affects both lungs (bilateral infiltrates). Pneumocystis jirovecii Morphology Trophozoite - thin-walled, irregularly shaped, 1-5 μm in size Precyst - an intermediate stage of the sexual phase, 5-8 μm in size Cyst - thick-walled, spherical, containing up to 8 intracystic bodies and up to 8 μm in size Risk factors HIV: $\text{CD4} < 200$ Primary immunodeficiency states Transplant recipients Hematological malignancies Clinical features Transmitted by respiratory droplets and is asymptomatic in immunocompetent individuals. In immunocompromised patients, life-threatening pneumonia develops. PCP - Pneumocystis Carinii pneumonia Dyspnoea Dry cough Fever Weight loss B/L interstitial pneumonia causing bilateral infiltrates Diagnosis GMS / Giemsa stain- mc used Giemsa, toluidine blue, methenamine silver, and calcofluor white stains can demonstrate trophozoites - cyst wall is black with a methenamine silver stain. {{caption_text}} {{caption_text}} Crushed Ping Pong ball (also called Helmet/Hat or Cup and Saucer appearance). The β -d-glucan test has proven to be quite useful for rapid diagnosis of Pneumocystis pneumonia with a high degree of sensitivity and specificity. Treatment The cornerstone for both prevention and treatment is trimethoprim-sulfamethoxazole. Alternative therapies have been used in AIDS patients; they include pentamidine, trimethoprim-dapsone, clindamycin-primaquine, atovaquone, and trimetrexate. Incorrect Options: Cryptococcus (Option A): This fungal infection can cause meningitis or pulmonary issues in immunocompromised patients but typically presents with a more localized infection rather than bilateral infiltrates. Histoplasmosis (Option B): While it is a fungal infection common in HIV patients, it typically causes granulomas or localized lung infiltrates, not usually bilateral infiltrates. Aspergillus (Option D): This fungus can cause lung infections, but it is more likely to cause invasive aspergillosis, which typically presents with a single, more focal lesion rather than bilateral infiltrates.

Q. A patient presents with a history of watery diarrhea and vomiting. The pathogen exhibited darting motility. Which is the best selective media for the involved pathogen?

- A. Nutrient media
- B. TCBS
- C. Cetrimide agar
- D. Potassium Tellurite Agar

 **Correct Answer: 2**

 **Solution:**

Correct Answer: B) TCBS Explanation: Given the clinical presentation of watery diarrhea and vomiting, the most likely pathogen involved is *Vibrio cholerae* or another species of the *Vibrio* genus, which are known to cause gastroenteritis and are characterized by darting motility under the microscope. TCBS agar is a selective culture medium specifically designed for isolating *Vibrio* species, including *Vibrio cholerae*. It allows for the growth of alkaline-tolerant bacteria and inhibits the growth of most other enteric bacteria. Colonies of *Vibrio cholerae* typically appear as yellow on this medium due to sucrose fermentation, making this method highly specific for confirming the diagnosis. Diagnosis of *Vibrio cholerae* Specimen Collection: Preferred Specimen: Stool (mucus flakes) Alternative: Rectal swab if stool is not available Enrichment broth : selenite F broth and alkaline peptone water Transport Media: VR (Venkatraman Ramakrishnan) media - specific transport media for *V. cholera* Cary-Blair medium Microscopy: Morphology: Comma or curved-shaped, reddish Gram-negative bacilli Appearance: Fish-in-stream appearance Motility: Demonstrated by dark field or phase contrast microscopy showing darting motility Culture: Culture Media and Colony Characteristics: MacConkey Agar: Colorless colonies that may later turn pink due to late fermentation of lactose Blood Agar: Green colonies indicating hemolysis Nutrient Agar: Translucent, round discs with a bluish tinge under transmitted light Gelatin Stab: Infundibuliform (funnel-shaped) or napiform (turnip-shaped) liquefaction Selective Media: Thiosulfate-Citrate-Bile Salts-Sucrose (TCBS) Agar: (Option B) Differentiates between sucrose fermenters (like *Vibrio cholerae*) and non-sucrose fermenters (such as *Vibrio parahaemolyticus*). *Vibrio cholerae* produces yellow colonies due to sucrose fermentation. {{caption_text}} Biochemical Reactions: Fermentation: Glucose and sucrose Indole Test: Positive Nitrate Reduction: Nitrates are reduced to nitrites Cholera Red Reaction: Due to nitroso-indole formation Catalase: Positive Oxidase: Positive String Test: A loopful of growth mixed with 0.5% deoxycholate results in string formation Serological Tests (Not useful for diagnosis) Indirect Hemagglutination Complement- Dependent Vibriocidal Antibody Test Treatment: Rehydration: Oral Rehydration Solution (ORS) Intravenous (IV) fluids Antibiotics: Secondary treatment Incorrect Options: Nutrient media (Option A): This is a general-purpose medium and is not selective, so it wouldn't be the best choice for isolating *Vibrio* species. Cetrimide agar (Option C): This medium is selective for

Pseudomonas aeruginosa, not *Vibrio* species. Potassium Tellurite Agar (Option D): This is typically used for isolating *Corynebacterium diphtheriae*, not for *Vibrio*.

Q. Which blood is transfused in a patient with a Bombay blood group?

- A. A
- B. B
- C. AB
- D. O negative

 **Correct Answer: 4**

 **Solution:**

Correct Answer: D) O negative Explanation: The Bombay blood group (hh) is a rare blood type in which the individual lacks the H antigen, which is a precursor for the A and B antigens on red blood cells. This means that a person with the Bombay blood group cannot receive blood from individuals with the typical ABO blood groups (A, B, AB, or O) since their immune system will recognize the A, B, and H antigens as foreign and mount an immune response. Because of this, only O negative blood (which lacks A, B, and H antigens) is compatible for transfusion to a person with the Bombay blood group. **Incorrect Options: A, B, and AB blood (Option A, B, & C):** These all contain the A, B, or both antigens, which a person with the Bombay blood group would react against due to the absence of the H antigen, leading to severe transfusion reactions.

Subject: Ophthalmology

Q. Which nerve defect causes lagophthalmos?

- A. 7th nerve
- B. 6th nerve
- C. 4th nerve
- D. 5th nerve

 **Correct Answer: 1**

 **Solution:**

Correct Answer: A) 7th nerve Explanation: Lagophthalmos is the inability to close the eye. It is a feature of 7th nerve palsy. Neuroparalytic keratitis can occur due to seventh nerve palsy, resulting in lagophthalmos from affected orbicularis oculi and leading to exposure keratitis Bell's palsy: Description Most common cause of facial palsy Characterized by idiopathic, LMN facial paralysis of acute onset Most commonly the Labyrinthine segment of

the facial nerve is involved. Males and females are equally affected. Aetiology Idiopathic: Most common cause Viral Infection: HSV && Herpes zoster Vascular Ischemia Hereditary: Positive family history in 6-8% Autoimmune Risk Factors More common in diabetics (due to angiopathy) and pregnant women (due to fluid retention). Clinical Features Sudden onset of facial paralysis with inability to close the eye (Bell's phenomenon) (Option A), asymmetry of the face, epiphora, drooping mouth, and dribbling of saliva. Associated symptoms may include ear pain, noise intolerance (stapedial paralysis), or loss of taste (chorda tympani involvement). Diagnosis Diagnosis is made by excluding other causes of peripheral facial paralysis. Treatment General: Reassurance, pain relief, eye protection and physiotherapy Medical: Prednisolone 60 mg per day for 5 days then reduced by 10 mg per day (for a total treatment time of 10 days) and 50 mg per day (in two divided doses) for 10 days, Acyclovir Surgical: Nerve decompression Prognosis 85%-90% of patients fully recover Incomplete resolution are mainly seen in recurrent/late recovery cases Incorrect Options: 6th nerve (Option B) leads to lateral rectus muscle paralysis, causing impaired abduction. 4th nerve (Option C) affects the superior oblique muscle, resulting in vertical diplopia. 5th nerve (Option D) is responsible for facial sensation and corneal reflex, but not eyelid closure.

Q. Which nerve innervates the lateral rectus muscle?

- A. Sixth nerve
- B. Seventh nerve
- C. Third nerve
- D. Fourth nerve

 **Correct Answer: 1**

 Solution:

Correct Answer: A) Sixth nerve Explanation: Nerves of the eye: Optic nerve (CN II) Purely sensory Senses the incoming light and image displayed on retina Oculomotor nerve (CN III) (Option C) Innervates majority of the extraocular muscles Motor innervation to the superior rectus muscle, medial rectus muscle, inferior rectus muscle, inferior oblique muscle, levator palpebrae superioris muscle, ciliary muscle, and the sphincter muscle. Trochlear nerve (CN IV) (Option D) Motor innervation to the superior oblique muscle Trigeminal Nerve (CN V) Ophthalmic branch of the trigeminal nerve provides sensory innervation to the eye Afferent part of corneal and lacrimation reflex Abducens Nerve (CN VI) (Option A) Motor innervation to the lateral rectus muscle Facial Nerve (CN VII) Motor innervation of the orbicularis oculi muscle Efferent part of corneal and lacrimation reflex Sympathetic Nervous System Long ciliary nerves: Innervates the pupillary dilator muscles causing mydriasis Parasympathetic nervous system Short ciliary nerves: Innervates the sphincter pupillae muscles causing miosis 7th CN palsy (Option D) This nerve innervates facial muscles, not extraocular muscles.

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

- A. VA $\leq$ 3/60
- B. VA $\leq$ 6/60
- C. VA $\geq$ 3/60
- D. VA $\geq$ 6/60

 **Correct Answer: 1**

 Solution:

Correct Answer: A) VA $\leq$ 3/60 Explanation: NPCB Classification of Visual Impairment The National Programme for Control of Blindness (NPCB) in India defines blindness as “visual acuity of $\leq$ 3/60 in a better eye with best possible correction” and central visual field $\leq$ 10 degrees. The NPCB further categorizes visual impairment as: Classification Visual Acuity Visual Impairment Visual acuity of less than 6/18 in the better eye with available correction Low Vision Visual acuity of less than 6/18 to 6/60 Economic Blindness Visual acuity of less than 6/60 to 3/60 Social Blindness Visual acuity of less than 3/60 to 1/60 Manifest Blindness Visual acuity of less than 1/60 to the perception of light Absolute Blindness No perception of light WHO Classification of Visual Impairment The World Health Organization (WHO) defines blindness as “visual acuity of less than 3/60 (Snellen) or its equivalent” (Option A) The International Classification of Disease 11 (2018) classifies vision impairment into distance and near-presenting vision impairment Classification Visual Acuity Mild Distance Vision Impairment Presenting visual acuity worse than 6/12 Moderate Distance Vision Impairment Presenting visual acuity worse than 6/18 Severe Distance Vision Impairment Presenting visual acuity worse than 6/60 Blindness Presenting visual acuity worse than 3/60 Near Vision Impairment Presenting near vision acuity worse than N6 or M0.8 at 40 cm with existing correction Option B,C and D are incorrect.

Subject: Orthopaedics

Q. The diagnosis in a patient who is unable to do internal and external rotation of the hip is?

- A. Femur head fracture
- B. Acetabular fractures
- C. Dislocation of hip
- D. Pelvis fracture

 **Correct Answer: 3**

 Solution:

Correct Option: C) Dislocation of the hip Explanation: The attitude of the lower limb in the dislocation of the hip is flexed, adducted and fully internally rotated which makes it impossible for further internal or external rotation of the hip. Posterior dislocation of hip Anterior dislocation of hip Mechanism of injury: Caused by force along the femoral shaft with the hip flexed (e.g., dashboard injury in motor accidents). Mechanism of injury: Rare injury that occurs with forced abduction and external rotation. Clinical Features: History of trauma. Pain, swelling. Deformity: flexion, adduction, internal rotation. Shortening of the leg. Femoral head is palpable in the gluteal region. Radiological Features: Femoral head displaced from the acetabulum. The thigh is internally rotated, the lesser trochanter is not seen, and Shenton's line is broken. May require a CT scan for associated fractures. Clinical features: The limb appears externally rotated. Possible lengthening of the affected limb The femoral head is palpable in the groin. Femur Head Fracture (Option A) may affect hip movement, it doesn't specifically cause a loss of both internal and external rotation as prominently as a dislocation Acetabular Fractures (Option B) may not result in an absolute inability to perform internal and external rotation unless they are associated with significant displacement or damage to the surrounding structures. Pelvic Fracture (Option D) does not typically cause a complete loss of internal and external rotation of the hip, unless there is concurrent injury to the hip joint itself.

Subject: PSM

Q. In the context of a new onset of a morbid disease, how does the change in incidence affect the prevalence of the disease?

- A. Prevalence is not related to incidence
- B. Incidence will increase, and prevalence will decrease
- C. Incidence and prevalence will increase
- D. Prevalence will increase with a decrease in the incidence

 **Correct Answer: 3**

 Solution:

Correct Option C- Incidence and prevalence will increase: When a new morbid disease appears, the number of new cases (incidence) will increase. As a result, more individuals will have the disease at any given time, contributing to an increase in prevalence. Incorrect Options: Options A, B, and D are incorrect, as explained above.

Q860001. Calculate relative risk for the given situation: Exposed to malaria Not exposed to malaria Vaccinated 6 94 Non-vaccinated 12 88

- A. 0.5
- B. 2
- C. 1.5
- D. 1.7

✓ **Correct Answer: 1**

🧠 Solution:

Correct Option A- 0.5 Explanation: Relative risk = Incidence in Vaccinated / Incidence in Non-Vaccinated
Relative risk (RR): Incidence in Vaccinated (Exposed to Malaria): Number of vaccinated individuals exposed: 6 Total vaccinated individuals: 6 (exposed) + 94 (not exposed) = 100
Incidence in vaccinated = $6/100 = 0.06$ (or 60/1000)
Incidence in Non-Vaccinated (Exposed to Malaria): Number of non-vaccinated individuals exposed: 12
Total non-vaccinated individuals: 12 (exposed) + 88 (not exposed) = 100
Incidence in non-vaccinated = $12/100 = 0.12$ (or 120/1000)
Relative Risk (RR): $RR = \text{Incidence in Vaccinated} / \text{Incidence in Non-Vaccinated}$
 $RR = 0.06 / 0.12 = 0.5$

Q859981. A gym owner observes that individuals who drink iced tea during their workouts tend to lose more weight. What is the nature of this relationship?

- A. Spurious
- B. Relative
- C. Direct
- D. Indirect

✓ **Correct Answer: 4**

🧠 Solution:

Correct Option D - Indirect Explanation: In this case, weight loss (outcome) is not directly caused by drinking iced tea (independent variable). A third factor could influence both, like the workout itself. Also, these individuals might be more health-conscious overall, engage in more vigorous workouts, or follow a better diet, which facilitates their weight loss.
Types of Association: Type of Association Description
Spurious (Option A) An association that appears to be present but is actually due to chance or an error in data. If the gym owner's observation was spurious, it would mean that the association between iced tea consumption and weight loss is completely false and exists due to some error in observation or data collection.
Indirect (Option D) An association in which a third variable (known as the confounding variable) causes both the predictor and the outcome.
Direct (Causal) (Option C) An association where the predictor directly influences the outcome. If the relationship between iced tea consumption and weight loss were direct, it would mean that drinking iced tea itself leads to weight loss. However, it is unlikely that drinking iced tea

alone would have a direct effect on weight loss. a. One-to-One causal A direct causal link between a single predictor and a single outcome. b. Multifactorial An association involving multiple factors contributing to the outcome. Relative (Option B): This would imply a comparison between two things, but doesn't directly address the relationship type.

Q859982. A study was conducted in 3 states to measure the mean blood pressure in each community. Health workers were assigned to visit each house in the 3 communities. The mean blood pressure of each community was then compared. What is the study design called?

- A. Case-control
- B. Cross-sectional
- C. Cohort
- D. Ecological study

 **Correct Answer: 2**

 **Solution:**

Correct Option: B) Cross sectional A cross-sectional study involves observing a defined population at a single point in time or over a short period. In this scenario, health workers measured the mean blood pressure of each community at one point in time, making it a cross-sectional study. Cross-sectional studies: Observations are done only once in the population. Carried over a given point of time or period of time. This helps to find out the existence of both old and new cases (Prevalence rate). This does not help to study the natural history of the disease and the risk factors. This is not time-consuming, not difficult, and cheap. Incorrect Options: Case-control (Option A): A case-control study compares individuals who have a specific condition (cases) with individuals who do not have the condition (controls). Cohort (Option C): A cohort study follows a group of people over time to see how their exposures affect their outcomes. Ecological study (Option D): An ecological study examines the relationships between exposure and outcome at the population or group level rather than the individual level.

Q859980. Which of the following is a technology-based surveillance system for tuberculosis (TB) in India?

- A. Nikshay
- B. Nischay
- C. Dots99
- D. DOTS

 **Correct Answer: 1**

 Solution:

Correct Option A - Nikshay Nikshay is a web-based solution for monitoring the Revised National Tuberculosis Control Program (RNTCP) and the National Tuberculosis Elimination Program (NTEP) in India. It is a Health Management Information System (HMIS) - an online software for reporting & compliance with treatment. Incorrect Options: Nischay (Option B): Nischay Kits are home-based UPT testing kits provided free by Asha DOTS 99 (Option C): DOTS 99 is a toll-free number written below anti-TB tablets to ensure the continuity of the treatment. The patients in the continuation phase are expected to call the Toll-free number when they take the medicine. DOTS (Option D): Directly Observed Treatment Short course involves the direct observation of patients taking their TB medication during the intensive phase by a healthcare worker.

Q859983. Wasting in a child is assessed by which of the following measures?

- A. Weight-for-height
- B. Weight-for-age
- C. Height-for-weight
- D. Height-for-age

 **Correct Answer: 1**

 Solution:

Correct Option A- Weight-for-height Explanation: Weight-for-height is a key indicator used to assess wasting in a child. Wasting refers to a child who has a low weight compared to their height, indicating acute undernutrition. Weight-for-height assesses acute malnutrition (wasting). Height-for-age assesses chronic malnutrition (stunting). Weight-for-age is an overall indicator but does not differentiate between acute and chronic malnutrition, making it less specific for either. Head circumference is a general indicator that can reflect both acute and chronic malnutrition, but it's not the primary marker for either. Incorrect Options: Options B, C, and D are not the key indicators for wasting.

Q859979. For what population size is an urban Primary Health Centre (PHC) typically intended?

- A. 1 per 50,000
- B. 1 per 100,000
- C. 1 per 250,000
- D. 1 per 200,000

 **Correct Answer: 1**

 Solution:

Correct Option A - 1 per 50,000 An urban Primary Health Centre (U-PHC) is designed to cater to a population of around 50,000 people. Type of primary health centre Plain population Hilly & tribal population Rural PHC 1 per 30,000 1 per 20,000 Urban PHC 1 per 50,000 - Multispeciality UPHC/Polyclinic 1 per 2-3 lakh - Incorrect Options: Options B, C & D: A U-PHC is not intended for such a large population as it might not effectively serve the healthcare needs of the population.

Q. What were the goals for Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) by 2023?

- A. 70/30
- B. 30/70
- C. 100/30
- D. 30/100

 **Correct Answer: 1**

 Solution:

Correct Option A - 70/30 The goal for MMR and IMR by 2023: Maternal Mortality Rate (MMR): Reduce to less than 70 per 100,000 live births. Infant Mortality Rate (IMR): Reduce to less than 30 per 1,000 live births.

Q. Which of the following is the vector responsible for transmitting Orientia tsutsugamushi?

- A. Mite
- B. Tick
- C. Louse
- D. Flea

 **Correct Answer: 1**

 Solution:

Correct Option A- Mite The vector responsible for transmitting Orientia tsutsugamushi, the causative agent of scrub typhus, is the Trombiculid mite, specifically the larval stage. Incorrect Options: Options B, C, and D are not responsible for transmitting Orientia tsutsugamushi.

Q. What is the WHO definition of blindness?

- A. 6/60
- B. 3/60
- C. 6/18
- D. 1/60

✓ **Correct Answer: 2**

🧠 Solution:

Correct Option B- 3/60 Explanation: The World Health Organization (WHO) defines blindness as a visual acuity of less than 3/60 in the better eye with the best possible correction. Distance vision impairment (WHO): Mild – visual acuity worse than 6/12 Moderate – visual acuity worse than 6/18 (Option C) Severe – visual acuity worse than 6/60 (Option A) Blindness – visual acuity worse than 3/60 (Option B) 1/60 (Option D): 1/60 is not the specific cut-off point defined by the WHO for blindness.

Q. In a population with a total of 4050 births, there are 50 stillbirths, 50 neonatal deaths within the first 7 days, and 150 deaths between 8 and 28 days of life. What is the Neonatal Mortality Rate (NMR) for this population?

- A. 12.5
- B. 50
- C. 49.4
- D. 62.5

✓ **Correct Answer: 2**

🧠 Solution:

Correct Option B- 50 Explanation: Neonatal Mortality Rate (NMR) measures the number of deaths of infants within the first 28 days of life per 1000 live births. It is calculated as, Neonatal Mortality Rate (NMR) = (No. of deaths of children (neonates) 0 – 28 days of life / live births) x 1000) Calculate Live Births: Live births = Total births - stillbirths Live births = 4050 - 50 = 4000 Determine the Total Number of Neonatal Deaths: Neonatal deaths include deaths within the first 7 days and between 8 and 28 days. Total neonatal deaths = 50 (deaths within the first 7 days) + 150 (deaths between 8 and 28 days) = 200 Calculate NMR: NMR = (200/4000) x 1000 = 50

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

- A. > 10 mg/L
- B. > 6 mg/L

- C. > 3 mg/L
- D. > 1.5 mg/L

✓ **Correct Answer: 1**

🧠 Solution:

Correct Option A- > 10 mg/L Explanation: Crippling fluorosis is a severe form of skeletal fluorosis that results in significant disability. It typically occurs when the fluoride concentration in drinking water exceeds 10 mg/L. Fluoride (mg/L) Effects Less than 0.5 Dental cavities 0.5–1.0 Protection against dental cavities. Good for bone and teeth. 1.5–3.0 Dental fluorosis 3.0–10 Skeletal fluorosis 10 or more Crippling skeletal fluorosis and severe osteosclerosis Drinking Water Quality Aspect Recommended Value Microbiological Aspects Coliform Bacteria (E. coli) 0 coliforms per 100ml of potable water Chemical Properties Chlorides Maximum: 600 mg/L Hardness 100-300 mg/L Total Dissolved Solids (TDS) Less than 600 mg/L (good), permissible up to 1000 mg/L Lead 0.01 mg/L Fluoride 0.5-0.8 mg/L Nitrate < 50 mg/L Physical Properties Turbidity Up to 5 NTU (Nephelometric Turbidity Unit) Color Up to 15 TCU (True Color Unit) or 5 Hazen units

Q. The Anemia Mukht Bharat program aims to address anemia across India through targeted interventions. Which statement accurately describes its administration of Iron and Folic Acid (IFA) supplementation?

- A. IFA is provided during the 2nd trimester of pregnancy and continues during lactation for up to 6 months
- B. IFA supplementation is administered solely during pregnancy
- C. A 100-day course of IFA supplementation is sufficient
- D. Administering IFA during the 1st trimester is adequate.

✓ **Correct Answer: 1**

🧠 Solution:

Correct Option A- IFA is provided during the 2nd trimester of pregnancy and continues during lactation for up to 6 months The Anemia Mukht Bharat program includes comprehensive IFA supplementation that begins during the 2nd trimester of pregnancy and continues through lactation for up to 6 months. Weekly Iron Folic Acid Supplementation: 5-9 year children: Weekly 1 IFA - 45 mg. of Fe + 400 mcg. of folic acid, sugar coated - pink color. Biannual deworming with one tablet of Albendazole tablet 400 mg done during the National Deworming days once in 6 months (10 of Aug and 10 of Feb of every year) Adolescent boys and girls - weekly 1 IFA - containing 100 mg Fe and 500 mcg of folic acid and biannual deworming with 1 tablet of 400 mg Albendazole. Pregnant women: starts in 2nd trimester of pregnancy and continues through lactation for up to 6 months. Incorrect Options: Options

B, C, and D are incorrect as IFA is provided during the 2nd trimester of pregnancy and continues during lactation for up to 6 months.

Subject: Pathology

Q. Which of the following organs is a primary lymphoid organ?

- A. Lymph node
- B. Spleen
- C. Thymus
- D. MALT

 **Correct Answer: 3**

 Solution:

Correct Answer: C) Thymus Explanation: The thymus is a primary lymphoid organ. Lymphoid Organs are structures involved in the production, maturation, and storage of immune cells, essential for the immune system to detect and respond to pathogens. They are classified as: Primary lymphoid organ (Development and maturation of T and B lymphocytes) Secondary lymphoid organ (Site of adaptive immune responses to antigens) Primary Lymphoid Organs Secondary Lymphoid Organs Bone Marrow: Origin of all blood cells from pluripotent hematopoietic stem cells (a process called hematopoiesis). Hematopoiesis shifts to bone marrow from the liver after fetal life, eventually confined to axial bones after puberty. Progenitor T and B cells develop in bone marrow; B cells mature here, while T cell progenitors migrate to the thymus. Lymph Nodes: (Option A ruled out) Filter antigens and activate T and B cells. Structured into cortex (B cell area), paracortex (T cell area), and medulla (rich in plasma cells). Spleen: (Option B ruled out) Largest secondary lymphoid organ, involved in filtering blood-borne antigens. Contains white pulp (T and B cells) and red pulp (site of RBC destruction). Thymus: (Option C) Site of T cell proliferation and maturation. Developed from the third/fourth pharyngeal pouch in embryonic life. Active during childhood, decreases in size after puberty. Thymic hormones (e.g., thymulin, thymopoietin) help attract and mature T cells. Central tolerance occurs here, removing self-reactive T cells to prevent autoimmunity. Mucosa-associated Lymphoid Tissue (MALT): (Option D ruled out) Located in mucosal sites (intestine, respiratory, urogenital tracts) to protect against pathogens. Includes loose clusters of lymphoid cells and organised structures (e.g., tonsils, Peyer's patches in intestines).

Q. A 35-year-old patient presents with colicky abdominal pain, joint pain, and palpable purpura. Urinalysis shows only red blood cells with no other significant findings. Which of the following is the likely diagnosis?

- A. IgA vasculitis
- B. Granulomatosis with polyangiitis
- C. Microscopic polyangiitis
- D. Behçet's disease

✓ **Correct Answer: 1**

🧠 **Solution:**

Correct Answer: A) IgA vasculitis Explanation: The scenario of colicky abdominal pain, joint pain, palpable purpura, and hematuria without proteinuria suggests Henoch-Schönlein Purpura (IgA Vasculitis). It is an IgA-mediated small vessel vasculitis characterized by inflammation of small blood vessels. The exact cause of HSP is unclear, but it is thought to involve an abnormal immune response, where IgA immune complexes deposit in blood vessel walls, causing inflammation and damage. It is more common in children but can occur in adults. It is characterized by Henoch Schonlein purpura (palpable purpura) Purpuric rash in lower limbs Abdominal pain Arthralgia Renal (hematuria) It is associated with elevated serum IgA levels. Urinalysis: The presence of red blood cells cast in urine. Granulomatosis with polyangiitis (GPA) (Option B), also known as Wegener's granulomatosis, is an autoimmune condition that primarily affects the small- to medium-sized blood vessels, leading to granulomatous inflammation and necrosis. It involves respiratory symptoms and renal issues, while Henoch-Schönlein Purpura (HSP) is more likely here due to abdominal pain, joint pain, and palpable purpura, which are hallmark features of HSP with IgA deposition. Microscopic polyangiitis (MPA) (Option C) is a small-vessel vasculitis primarily affecting the kidneys and lungs, often presenting with rapidly progressive glomerulonephritis and pulmonary symptoms like hemoptysis, along with ANCA positivity. Behçet's disease (Option D) is a systemic vasculitis that presents with oral and genital ulcers, ocular involvement, and skin lesions like erythema nodosum.

Subject: Pediatrics

Q. What condition is likely in a newborn presenting with dry, rough skin, a big tongue and rough hair?

- A. Congenital hypothyroidism
- B. Prader-Willi syndrome
- C. Edward syndrome
- D. Galactosemia

✓ **Correct Answer: 1**

 Solution:

Correct Answer: A) Congenital hypothyroidism Explanation: Congenital hypothyroidism (also known as cretinism) presents with: Dry, rough skin Macroglossia (an enlarged, protruding tongue) Rough hair Congenital Hypothyroidism Clinical features Usually birth weight & length is normal Wide open anterior fontanelle Delayed closure of anterior fontanelle Prolonged physiological jaundice- Early sign (it is due to delayed maturation of glucuronide conjugation) Myxedematous facies: Large, protruded tongue (Macroglossia) Cold intolerance Hypotonia Rough skin and Rough hair Constipation Abdominal distension Umbilical hernia In Untreated Cases: Delayed development Intellectual disability Delayed dentition Short stature Delayed puberty Delayed bone maturation X-ray findings in congenital hypothyroidism: Absence of distal femoral and proximal tibial epiphysis at birth Punctate epiphyseal dysgenesis Deformity or breaking of the 12th thoracic or 1st or 2nd lumbar vertebrae X-ray image of skull- large fontanelle and wide sutures Screening: Universal newborn screening for congenital hypothyroidism At birth, with umbilical cord blood Heel prick: dried blood spots, sample collected beyond 48 hrs or 48-72hrs Should not be done in first 1-2 days, to avoid TSH surge Most sensitive approach- check for T4 and TSH both ASH's first strategy: Initial TSH screening using dried blood spot If TSH>20mIU/L, recheck Obtain a venous blood sample to check T4 and TSH levels if TSH remains elevated. Treatment Oral levothyroxine (early morning with empty stomach for older children; and for newborns, it is to be given at a fixed time). The dose is higher in the earlier age group and as the babies grow the dose reduces. Newborn- 10-15mg/kg/day Children- 2-4mg/kg/day Incorrect Options: Prader-Willi syndrome (Option B): This genetic disorder presents with poor feeding and hypotonia in infancy, followed by excessive eating and obesity in early childhood. It is also associated with intellectual disability & hypogonadism. It does not typically present with the skin, tongue, and hair changes. Edward syndrome (Option C): This chromosomal disorder (trisomy 18) presents with distinctive features, including rocker-bottom feet, overlapping fingers, cardiac anomalies, kidney malformations and microcephaly. The described skin and tongue manifestations are not typical features. Galactosemia (Option D): Galactosemia is characterized by jaundice, hepatomegaly, diarrhea, and vomiting. It does not cause the characteristic skin, tongue, and hair changes.

Q. What is the likely age of a child who can ride a tricycle, walk up stairs with alternate steps, but cannot hop?

- A. 2.5 years
- B. 3.5 years
- C. 4.5 years
- D. 5.5 years

 **Correct Answer: 2**

 Solution:

Correct Answer: B) 3.5 years Explanation: The clinical scenario indicates a child at 3.5 years of age based on the developmental milestones described. At this age, children typically achieve the ability to ride a tricycle and climb stairs with alternating feet, while hopping skills are still developing. At 3 years, a child goes upstairs with alternating feet & downstairs with 2 per step and rides a tricycle. A child hops at 4 years and goes downstairs with alternating feet. Since the child described cannot hop, they are likely younger than 4 years old. So, the developmental age of the child is more than 3 years and less than 4 years. Incorrect Options: 2.5 years (Option A): At 2.5 years, children usually go upstairs and downstairs with two feet per step but can not ride a tricycle. 4.5 years (Option C): By 4.5 years, children should be able to hop and go up and down stairs with alternating feet. 5.5 years (Option D): At 5.5 years, children should be able to skip and stand on one leg for more than 10 seconds. Also, hopping skills are well developed.

Q. What is the daily fluid requirement for a 3-day-old baby with a birth weight of 1500 grams?

- A. 100-110 ml/kg/day
- B. 80-90 ml/kg/day
- C. 120-130 ml/kg/day
- D. 130-150 ml/kg/day

 **Correct Answer: 2**

 Solution:

Correct Answer: B) 80-90 ml/kg/day Explanation: The fluid requirement of a baby weighing 1500gm or more is: Day 1: 60ml/kg/day Day 2: Increase it by 10-15 ml/kg/day) = 70-75 ml/kg/day Day 3: Increase it by 10-15 ml/kg/day) = 80-90 ml/kg/day Daily fluid requirements Birth Weight Day 1 2-6 7 & Beyond <1500 gm 80 ml/kg/day Increase daily by 10-15 ml/kg/day 150 ml/kg/day >1500 gm 60 ml/kg/day Increase daily by 10-15 ml/kg/day 150 ml/kg/day

Q. What could be the possible diagnosis for a newborn exhibiting weak lower limb pulses and strong upper limb pulses?

- A. TGA
- B. COA
- C. TOF
- D. Ebstein anomaly

 **Correct Answer: 2**

 Solution:

Correct Answer: B) COA Explanation: The clinical manifestations indicate Coarctation of Aorta (COA), a congenital narrowing of the aorta typically occurring just distal to the left subclavian artery at the insertion of the ductus arteriosus. Coarctation of the Aorta is characterized by weak femoral pulses (lower limb pulses) and strong upper limb pulses. There is a disparity in pulsation and BP in the arms and legs. This is referred to as Radio-femoral delay. Coarctation of the Aorta Definition Constrictions of the aorta of varying degrees at any point from the transverse arch to the iliac bifurcation. Clinical presentation: Differential cyanosis Heart failure in severe cases Weakness or pain/ Claudication (or both) in the legs after exercise Radio-femoral delay: Disparity in pulsation and BP in the arms and legs Systolic or continuous murmurs are heard over the left and right sides of the chest laterally and posteriorly due to collateral blood flow. Investigation: Chest x-ray: The arrows indicate rib notching and the yellow line shows the site of coarctation Enlarged left subclavian artery produces a prominent shadow in the left superior mediastinum. Notching of the inferior border of the ribs from pressure erosion by enlarged collateral vessels (Common in late childhood after 1st decade of life) Descending aorta has an area of post-stenotic dilation. ECG, echocardiography, colour Doppler, CT, and MRI. Treatment: Infusion of prostaglandin E1 to reopen the ductus and reestablish adequate lower-extremity blood flow. Surgical repair Incorrect Options: Transposition of Great Arteries (TGA) (Option A) is a congenital heart defect where the aorta arises from the right ventricle, and the pulmonary artery arises from the left ventricle. It presents with early cyanosis and circulatory compromise but does not typically cause differential pulses between the upper and lower extremities. Tetralogy of Fallot (TOF) (Option C): While TOF causes cyanosis and may have associated heart failure, it does not cause differential pulses between the upper and lower extremities. TOF is characterized by ventricular septal defect, overriding aorta, pulmonary stenosis and right ventricular hypertrophy. Ebstein anomaly (Option D): This condition involves abnormal positioning of the tricuspid valve and right heart dysfunction but does not cause differential pulses.

Q. At what age does the transfer of one object to another hand happen?

- A. 4 months
- B. 9 months
- C. 7 months
- D. 12 months

 **Correct Answer: 3**

 Solution:

Correct Answer: C) 7 months Explanation: Transfer of objects between hands is an important fine motor milestone in infant development. Transfer of objects from one hand to

another is a fine motor skill It appears at 7 months of age Represents development of hand coordination Part of neurological development

Subject: Pharmacology

Q. What is the mechanism of action of Ethosuximide?

- A. Enhances GABAergic inhibition
- B. Inhibits calcium channels in thalamic neurons
- C. Blocks sodium channels
- D. Increases serotonin levels

 **Correct Answer: 2**

 Solution:

Correct Answer: B) Inhibits calcium channels in thalamic neurons Explanation: Ethosuximide blocks T-type calcium channels in the thalamus and prevents the firing of action potential to the cortex. By inhibiting these channels, ethosuximide reduces neuronal excitability in the thalamus and helps prevent these abnormal brain wave patterns, thereby controlling the seizures. It is the drug of choice in typical absence seizures. Incorrect Options: Enhances GABAergic inhibition (Option A): Drugs like benzodiazepines (e.g., diazepam) and barbiturates enhance GABAergic inhibition by increasing GABA receptor activity. Ethosuximide does not primarily act on GABA receptors. Blocks sodium channels (Option C): Sodium channel blockers (e.g., phenytoin, carbamazepine) are effective for other types of seizures, but ethosuximide does not primarily work by blocking sodium channels. Increases serotonin levels (Option D): Some antidepressants and antipsychotics modulate serotonin levels, but ethosuximide's mechanism of action is not related to increasing serotonin.

Q. What is the primary mechanism of action of methotrexate?

- A. Inhibits DNA synthesis by blocking thymidylate synthase
- B. Inhibits dihydrofolate reductase, leading to decreased DNA synthesis
- C. Inhibits RNA synthesis by blocking RNA polymerase
- D. Interferes with microtubule formation during cell division

 **Correct Answer: 2**

 Solution:

Correct Answer: B) Inhibits dihydrofolate reductase, leading to decreased DNA synthesis Explanation: Methotrexate is an antimetabolite and antifolate drug that primarily inhibits

the enzyme dihydrofolate reductase (DHFR). DHFR is responsible for converting dihydrofolate (DHF) into tetrahydrofolate (THF). THF is essential for the synthesis of purine nucleotides and thymidylate, which are crucial for DNA synthesis and repair. (Option A) By inhibiting DHFR, methotrexate decreases the production of THF, leading to a reduction in DNA synthesis. Inhibits RNA synthesis by blocking RNA polymerase (Option C): Methotrexate does not inhibit RNA polymerase directly. It primarily affects DNA synthesis by inhibiting DHFR. Interferes with microtubule formation during cell division (Option D): This mechanism is associated with drugs like taxanes and vinca alkaloids, which disrupt microtubule dynamics and mitosis. Methotrexate does not work through this mechanism.

Subject: Physiology

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

- A. 125 ml/min
- B. 200 ml/min
- C. 100 ml/min
- D. 150 ml/min

 **Correct Answer: 1**

 **Solution:**

Correct Answer: A) 125 ml/min Explanation: This is the typical GFR for a healthy adult. GFR measures how well the kidneys are filtering blood. A rate of 125 ml/min reflects optimal kidney function and is considered normal. Glomerular Filtration Rate: GFR is the rate at which plasma is filtered by the glomeruli in the kidneys. It is a key indicator of kidney function, as it shows how efficiently the kidneys are filtering wastes from the blood. The normal GFR range is around 90-120 ml/min/1.73 m²; for most adults, but 125 ml/min is considered the standard average for a healthy individual. The formula to calculate GFR is: $GFR = \text{Net Filtration Pressure (NFP)} \times \text{Filtration Coefficient (Kf)}$ Net Filtration Pressure (NFP) is determined by the difference between the hydrostatic pressure in the glomerular capillaries and the opposing pressures in the Bowman's capsule and the colloid osmotic pressure of the blood. Filtration Coefficient (Kf) depends on the surface area and permeability of the glomerular capillaries. Factors affecting GFR include: Renal Blood Flow: Increased blood flow boosts GFR, while decreased blood flow reduces it. Hydrostatic and Osmotic Pressures: High glomerular capillary pressure increases GFR, whereas high pressure in Bowman's capsule or elevated colloid osmotic pressure decreases it. Constriction of Afferent and Efferent Arterioles: Constriction of afferent arterioles reduces GFR, while constriction of efferent arterioles can increase GFR. Hormonal and Neural Controls: Various hormones like angiotensin II and conditions like sympathetic nervous system activation can modulate GFR by affecting blood flow and pressure within the kidneys.

Q. What renal function is represented by the formula UV/P ?

- A. Filtration
- B. Tubular Secretion
- C. Tubular Reabsorption
- D. Clearance

 **Correct Answer: 4**

 **Solution:**

Correct Answer: D) Clearance Explanation: The formula UV/P , where U is the concentration of a substance in the urine, V is the urine flow rate, and P is the concentration of the substance in the plasma, represents the renal clearance of that substance. It quantifies the volume of plasma from which the substance is completely removed per unit time. Clearance measures the volume of plasma completely cleared of a substance by the kidneys per minute (mL/min), reflecting renal excretory efficiency. It is essential for evaluating kidney function, including filtration, reabsorption, and secretion processes. To calculate the clearance rate (Cs) of the substance, use the formula: Clearance Formula: $(Cs) = (Us \times V) / Ps$ Us: Urine concentration of the substance V: Urine flow rate Ps: Plasma concentration of the substance Types of Clearance Measurements: Inulin Clearance Used to measure Glomerular Filtration Rate (GFR) as it is freely filtered but not reabsorbed or secreted. Not ideal for routine use due to intravenous administration. Creatinine Clearance Estimates GFR using creatinine, which is primarily filtered by the glomeruli. Slightly inaccurate due to tubular secretion, but practical for clinical settings. PAH Clearance Estimates Renal Plasma Flow (RPF). PAH is cleared through both glomerular filtration and tubular secretion. Correction for PAH extraction ratio improves accuracy. Filtration (Option A): This process refers to the initial filtration of blood through the glomerulus to form filtrate. The formula does not measure this process directly. Tubular Secretion (Option B): This is the process by which substances are actively transported from the blood into the renal tubules. The formula does not specifically measure tubular secretion. Tubular Reabsorption (Option C): This refers to the process of reabsorbing substances from the renal tubules back into the blood. The formula does not measure reabsorption directly.

Subject: Psychiatry

Q860139. What is the medical term for a person who fears seeing tall buildings and looking down from heights?

- A. Agoraphobia
- B. Acrophobia
- C. Claustrophobia

- D. Nomophobia

✓ **Correct Answer: 2**

🧠 Solution:

Correct Answer: B) Acrophobia Explanation: Acrophobia is referred to as an intense fear of heights, often leading to anxiety and panic when in high places or even when thinking about being at a height. The term "phobia" is used when fear is limited to a specific object, situation, or idea. Phobias are linked to physical symptoms of anxiety and a tendency to avoid the feared stimulus. Incorrect Options: Agoraphobia (Option A) is a fear of entering open or crowded places or being in places where escape might be difficult. Those affected often avoid crowded areas, public transport, or being far from home, and in severe cases, may avoid leaving home altogether. Claustrophobia (Option C) is the intense fear of enclosed or small spaces. These individuals may experience anxiety, panic, and discomfort when in places like elevators, tunnels, or crowded rooms. Nomophobia (Option D) is a fear or anxiety of being without a mobile phone or losing access to it. People often experience distress when they cannot use their phone due to factors like low battery, lack of signal, or being without it.

Q. A mother presented her daughter with complaints that she has started behaving weirdly about her food habits for the last few months. She eats a lot of burgers in one go, and then she vomits it out. Her BMI is 27. What is the most probable diagnosis?

- A. Anorexia nervosa
- B. Binge eating disorder
- C. Bulimia nervosa
- D. OCD

✓ **Correct Answer: 3**

🧠 Solution:

Correct Answer: C) Bulimia nervosa Explanation: The patient exhibits binge eating followed by vomiting, which is characteristic of Bulimia nervosa (eating disorder). Bulimia Nervosa (eating disorder) Age of Onset Late adolescence and young adulthood (8-21 years). Features Binge Eating Episodes: Recurring episodes of binge eating, occurring at least weekly for the last 3 months. Compensatory Behaviors: Purging behaviours (self-induced vomiting, laxative abuse, diuretics), excessive exercise, fasting. BMI: Often normal or slightly overweight (compared to anorexia nervosa). Gender prevalence: More common in females than males. Physical signs Appear due to repeated purging. Parotitis or (parotid gland hypertrophy (may see increased serum amylase) Enamel erosion (from vomiting) Dental caries Mallory-Weiss syndrome (esophageal tears). Russell's Sign (callus on knuckles:

Due to self-induced vomiting, the knuckles get injured by the teeth. {{caption_text}}

Treatment Cognitive Behavioral Therapy (CBT): First-line treatment focuses on modifying distorted thoughts and behaviours related to eating and body image. Nutritional Rehabilitation: Aimed at restoring healthy eating patterns and addressing nutritional deficiencies. Antidepressants Fluoxetine: Most effective medication for reducing binge-eating episodes and associated symptoms. Topiramate: This can be effective in suppressing binge eating but not as commonly used as fluoxetine. Bupropion: Contraindicated due to an increased risk of seizures, especially in patients with eating disorders. Evidence indicates that CBT and medications (particularly fluoxetine) are the most effective combination. Incorrect Options: Anorexia nervosa (Option A) involves an intense fear of gaining weight and a distorted body image, as seen in the patient's anxiety over gaining a few pounds. It also includes behaviours like binge eating followed by purging, such as self-induced vomiting, but with a decreased BMI. Binge eating disorder (Option B) does not involve purging behaviours and is characterised by episodes of eating large quantities of food without compensatory actions. OCD (Obsessive Compulsive Disorder) (Option D) is not an eating disorder. It is characterised by persistent, unwanted thoughts (obsessions) and repetitive behaviours (compulsions) performed to reduce anxiety. Individuals often feel compelled to engage in these actions despite recognising them as irrational.

Subject: Radiology

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

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

 **Correct Answer: 2**

 **Solution:**

Correct Answer: B) Prostate cancer Explanation: The Ga-68 PSMA PET scan is specifically designed to detect prostate cancer. PSMA stands for Prostate-Specific Membrane Antigen, which is a protein highly expressed on the surface of prostate cancer cells. The PET scan utilizes a radiotracer labeled with Gallium-68 to target and visualize these PSMA proteins, thus providing detailed imaging of prostate cancer. Advancements in Prostate Cancer Diagnosis: Prostate Cancer Statistics: Second most common cancer in men and the sixth leading cause of cancer-related death globally. Early detection leads to a cure rate of over 90%. Role of Molecular Imaging: Essential for individualized diagnosis and treatment of prostate cancer. Utilizes modalities like PET, SPECT, MRI, CT, ultrasound, and bioluminescence for non-invasive cellular and molecular imaging. Limitations of 18F-FDG

PET: Not routinely used for early-stage prostate cancer due to its low metabolic activity in prostate cancer cells. Advancement with Ga-68 PSMA Imaging: A groundbreaking tool in nuclear medicine for managing metastatic prostate cancer, gaining global recognition. Ga-68 PSMA PET scan is a highly sensitive imaging modality primarily used for the detection and management of prostate cancer. It utilizes a radiotracer labeled with Gallium-68 that binds to Prostate-Specific Membrane Antigen (PSMA), which is overexpressed in prostate cancer cells. Lung cancer (Option A): Imaging for lung cancer usually involves CT, PET-CT with FDG, or biopsy for diagnosis. Colon cancer (Option C): FDG PET-CT is used for staging and recurrence detection in colorectal cancer. Liver cancer (Option D): Diagnosis of liver cancer (e.g., HCC) relies on imaging modalities like multiphase CT or MRI; PET-CT may play a secondary role.

Subject: Surgery

Q860167. A 35-year-old woman, 10 years after mastectomy, notices gradual swelling and heaviness in her right upper limb without pain. On examination, bluish nodules on the skin with no infections are noted. What is the most likely cause of her symptoms?

- A. Lymphangiosarcoma
- B. Thoracic outlet syndrome
- C. Chronic venous insufficiency
- D. Recurrent breast cancer

 **Correct Answer: 1**

 Solution:

Correct Answer: A) Lymphangiosarcoma Explanation: Lymphangiosarcoma is the most likely cause of these symptoms, especially in a patient with a history of mastectomy. This condition, also known as Stewart-Treves syndrome, can develop years after mastectomy due to long-standing lymphedema, which is a consequence of lymphatic obstruction.

Complications of mastectomy: Complications Explanations Lymphedema Swelling is caused by the accumulation of lymph fluid in the arm or chest wall due to the removal of lymph nodes. (After MRM and axillary dissection) Wound infection/Flap necrosis Postoperative infections where blackening of suture line is seen (flap necrosis), if necrosed site not removed, leads to wound infection Post-Mastectomy Pain Syndrome Chronic pain in the chest or upper arm due to nerve damage or scar tissue formation. Nerve Injuries Long thoracic nerve- injury leads to winging of the scapula Thoracodorsal nerve Lymphangiosarcoma Stewart-Treves syndrome - Cancerous growth in the lymphatic vessels, often associated with long-standing lymphedema. After an average of 10.5 years following MRM and radiotherapy, the patient develops angiosarcoma Thoracic Outlet Syndrome (Option B) is characterised by symptoms such as pain, paraesthesia, oedema, cyanosis, cold extremities, and weakness in the hands. Chronic Venous Insufficiency (Option C) typically

presents with postural discomfort, varicose veins, oedema, skin pigmentation, induration, dermatitis, lipodermatosclerosis, and ulceration. Recurrent Breast Cancer (Option D) usually presents with a palpable lump, nipple retraction, swelling of lymph nodes, and signs of metastasis.

Q. A patient presents with calf pain while walking a certain distance. The pain is severe enough that he must stop and rest before continuing. According to Boyd's grading, which of the following grades best describes this condition?

- A. Grade 1
- B. Grade 2
- C. Grade 3
- D. Grade 4

 **Correct Answer: 3**

 Solution:

Correct Answer: C) Grade 3 Explanation: Grade III is characterised by pain that persists during walking, and the patient has to stop and rest to relieve the pain. Boyd's classification of intermittent claudication: Grade Description Grade I Pain develops after walking a certain distance (claudication distance). The pain subsides due to increased blood flow and collateral circulation. Grade II Pain persists even while continuing to walk, but the patient can still walk with effort. Grade III Patient must stop and rest to relieve the pain; walking becomes significantly impaired. Grade IV Patient experiences rest pain, and the pain persists even at rest, indicating severe arterial disease.

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