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Exam: FMGE June 2024 Question Paper

Subject: Anaesthesia

Q. Which of the following inhalation agents has a blood-gas partition coefficient similar to nitrous oxide?

- A. Isoflurane
- B. Desflurane
- C. Sevoflurane
- D. Halothane

✅ *Correct Answer: 2*

🧠 Solution:
Correct Option: B) Desflurane Explanation: Desflurane Properties Desflurane is a fluorinated ether with high vapor pressure (681 mm Hg at 20°C) and very low blood solubility (λb/g 0.42), allowing rapid induction and emergence. It requires a special vaporizer (tec 6) for precise anesthetic control. {{caption_text}} Tec 6 Blood gas coefficient indicates speed of onset and recovery, solubility of inhalational agent in the blood. It is inversely proportional to speed of onset High B/G has a slow onset Low B/G has a fast onset Desflurane has similar blood-gas partition co-efficient similar to Nitrous oxide. Uses Desflurane is ideal for rapid induction and emergence due to its low blood solubility, but it is not suitable for inhalation induction due to its pungency and airway irritation. C/I It should be avoided in patients with severe hypovolemia, malignant hyperthermia, and intracranial hypertension. Systemic Effects Cardiovascular Desflurane decreases systemic vascular resistance and arterial blood pressure. It causes moderate increases in heart rate, central venous pressure, and pulmonary artery pressure, particularly during rapid concentration increases, which can be managed with fentanyl, esmolol, or clonidine. Respiratory Causes decreased tidal volume and increased respiratory rate. It is pungent and can cause airway irritation, making it unsuitable for inhalation induction. Hepatic Minimal metabolism and risk of anesthetic-induced hepatitis, with maintained hepatic oxygen delivery. Renal Minimal nephrotoxicity, but decreases in urine output and glomerular filtration occur with reduced cardiac output. Neuromuscular Desflurane causes a dose-dependent decrease in neuromuscular response, enhancing the effects of nondepolarizing neuromuscular blockers. Cerebral Increases cerebral blood flow (CBF), intracranial pressure, and cerebral blood volume but decreases cerebral oxygen consumption. CBF can be lowered through hyperventilation. Incorrect Options: Other incorrect options do not have blood gas partition co-efficient similar to nitrous oxide. Isoflurane (Option A): Most commonly used in CVS and CNS surgeries Cost-effective Sevoflurane (Option C): Induction agent of choice in children

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Second fastest-acting inhalational agent Halothane (Option D): Undergoes maximum metabolism in liver (20%) Most hepatotoxic- can cause halothane-induced hepatitis if given repeatedly

Q. In epidural anesthesia, which of the following layers is least likely to be punctured during the procedure?

- A. Arachnoid mater
- B. Ligamentum flavum
- C. Supraspinous
- D. Infraspinous

✅ *Correct Answer: 1*

🧠 Solution:
Correct Option: A) Arachnoid mater Explanation: It is least likely to be punctured in epidural anesthesia as it is not intended to be pierced. Order in which structures are pierced: Skin Subcutaneous fat Supraspinous ligament (Option C) Interspinous ligament (Option D) Ligamentum flavum (Option B)

Subject: Anatomy

Q. Identify the marked structure:

- A. Internal capsule
- B. Body of fornix
- C. Globus pallidus
- D. Lateral ventricle

✅ *Correct Answer: 1*

🧠 Solution:
Correct Answer: A) Internal capsule Explanation: Internal Capsule The internal capsule is a compact bundle of projection fibres that connects the cerebral cortex with subcortical centres such as the thalamus, brainstem, and spinal cord. It contains both afferent (sensory) fibres from the thalamus to the cortex and efferent (motor) fibres from the cortex to the cerebral peduncle and midbrain. INTERNAL CAPSULE: V-shaped projection fiber—angled laterally, present between thalamus and caudate nucleus medially and lentiform nucleus laterally. Parts of Internal Capsule: Anterior limb: Between caudate nucleus medially and lentiform nucleus laterally. Posterior limb: Between thalamus medially and lentiform nucleus laterally. Genu: Between anterior and posterior limb. Sublentiform: Present below the lentiform. Retrolentiform: Present behind lentiform. Lesion of Internal Capsule Occurs due to hemorrhage, leading to spastic paralysis (due to involvement of

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pyramidal and extrapyramidal fibers for the upper limb, trunk, and lower limb) and loss of sensations in the opposite half of the body. Most commonly involved artery – Charcot’s artery of cerebral hemorrhage (striate branches from middle cerebral artery). Lesions in the sublentiform and retrolentiform parts of the internal capsule lead to visual loss and auditory defects. (Option B, C, and D ruled out)

Q. Which muscle movements are related to the Abducens nerve?

- A. Lateral rectus
- B. Medial rectus
- C. Superior oblique
- D. Inferior oblique

✅ ***Correct Answer: 1***

🧠 Solution:
Correct Answer: A) Lateral rectus Explanation: The lateral rectus muscle is supplied by the Abducens nerve. Extraocular muscles Voluntary muscles Involuntary muscles Four recti muscles Superior rectus Inferior rectus Medial rectus Lateral rectus Two oblique muscles Superior oblique Inferior oblique Levator palpebrae superioris (1) Superior tarsal or Muller's muscle Inferior tarsal Orbitalis. Origin, insertion, and nerve supply of extraocular muscles: Origin Insertion Nerve supply (SO4, LR6) Recti Common annular tendon or tendinous ring of Zinn. (all recti have the same origin) Sclera little posterior to the limbus (corneoscleral junction) The average distance from Limbus is: Superior: 7.7 mm Inferior: 6.5 mm Medial: 5.5 mm Lateral: 6.9 mm Lateral rectus: Abducens nerve Rest all other recti: Oculomotor nerve (Option B) Superior oblique The undersurface of the lesser wing of the sphenoid Into the sclera behind the equator in the posterior superior quadrant of the eyeball. Trochlear nerve (Option C) Inferior oblique The orbital surface of the maxilla Into the sclera behind the equator in the posterior superior quadrant of the eyeball, a little below the superior oblique. Oculomotor nerve (Option D) Levator palpebrae superioris Orbital surface of the lesser wing of the sphenoid bone. Superior lamella: Anterior surface of the superior tarsus and skin of the upper eyelid. Inferior lamella: Upper margin of the superior tarsus and the superior conjunctival fornix. Actions of muscles on the eyeball: Mnemonic SIN- Superior rectus/ Superior oblique assist in INtorsion RAD- Rectus muscles help in ADduction Superior rectus (SR) Medial rectus (MR) Inferior rectus (IR) Lateral rectus (LR) Superior oblique (SO) Inferior oblique (IO) Elevation Adduction Intorsion Adduction Depression Adduction Extorsion Abduction Depression Abduction Intorsion Elevation Abduction Extorsion

Subject: Biochemistry

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

- A. Hyaluronic Acid
- B. Glucuronic Acid
- C. Gluconic Acid

- D. Glycolic Acid

✅ *Correct Answer: 2*

🧠 Solution:
Correct Answer: B) Glucuronic Acid Explanation Glucuronidation is a biochemical process in which a glucuronic acid molecule is attached to a substance, making it more water-soluble and easier to excrete. This process is essential for the detoxification and elimination of substances like bilirubin, drugs, and hormones in the liver. Synthetic Reaction Description Examples Glucuronidation Conjugation with glucuronic acid via UDP-glucuronosyl transferases (UGTs). Chloramphenicol, aspirin, paracetamol, morphine, bilirubin, steroid hormones, thyroxine. Acetylation Conjugation with acetyl CoA, mediated by N-acetyl transferases. Isoniazid, sulfonamides, hydralazine, dapsone, clonazepam. Methylation Methylation of amines and phenols by methyl transferases using methionine or cysteine as donors. Adrenaline, histamine, methyldopa, captopril, mercaptopurine. Sulfation Conjugation of phenols and steroids with sulfate by sulfotransferases (SULTs). Chloramphenicol, methyldopa, adrenal steroids. Glycine Conjugation Conjugation with glycine for drugs with carboxylic acid groups. Salicylates, nicotinic acid. Glutathione Conjugation Conjugation of reactive intermediates with glutathione via glutathione-S-transferases. Paracetamol (reactive intermediates), quinones, epoxides. Ribonucleoside Synthesis Conjugation for activation of purine and pyrimidine antimetabolites. Cancer chemotherapeutic agents. Hyaluronic Acid (Option A): Hyaluronic acid is a glycosaminoglycan involved in extracellular matrix formation and lubrication of joints. It does not play a role in hepatic conjugation processes. Gluconic Acid (Option C): Gluconic acid is a product of glucose oxidation and is not involved in the conjugation process in the liver. Glycolic Acid (Option D): Glycolic acid is an alpha-hydroxy acid commonly associated with skincare and is not involved in hepatic conjugation.

Q. A 7-year-old child of short stature presents with skin patches and learning difficulties. Diagnostic workup indicates a defect in DNA repair specifically related to double-strand breaks. What is the most likely diagnosis?

- A. Bloom Syndrome
- B. Xeroderma Pigmentosum
- C. Cockayne Syndrome
- D. Lynch Syndrome

✅ *Correct Answer: 1*

🧠 Solution:
Correct Answer: A) Bloom Syndrome Explanation Bloom Syndrome Bloom syndrome is caused by a defect in the BLM gene, which encodes a RecQ helicase essential for DNA repair, particularly double-strand break repair. Clinical Features: Physical: Short stature, narrow face, small jaw, large ears, and high-pitched voice. Skin: Red rash on sun-exposed areas (face,

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arms, hands) with dilated blood vessels; patches of lighter/darker skin. Development: Fertility and learning difficulties; growth and developmental delays. Infections: Frequent ear and lung infections. Comorbidities: Increased risk of diabetes and chronic obstructive pulmonary disease (COPD). Cancer Risk: Early-onset cancers, especially squamous cell skin cancer, leukemia, lymphoma, and gastrointestinal cancers. Xeroderma pigmentosum (Option B): It is an autosomal recessive disorder characterized by sun sensitivity, with approximately 50% of patients having acute burning on minimal sun exposure. UV radiation causes the cross-linking of pyrimidine residues, preventing normal DNA replication. Nucleotide excision repair (NER) prevents this DNA damage. Inherited loss-of-function mutations in any of these genes give rise to xeroderma pigmentosum. The onset of freckling (lentigines) on sun-exposed skin before age two years in most patients. At an early age, there is a significantly increased risk of sunlight-induced cutaneous neoplasms (basal cell carcinoma, squamous cell carcinoma, melanoma). Cockayne Syndrome (Option C): Cockayne syndrome is associated with defective transcription-coupled nucleotide excision repair, resulting in photosensitivity, growth failure, and neurodevelopmental abnormalities. Double-strand break repair is not affected. Lynch Syndrome (Option D): Lynch syndrome, also known as hereditary non-polyposis colorectal cancer (HNPCC), involves a defect in mismatch repair genes (MLH1, MSH2, MSH6, PMS2). It is not associated with childhood growth failure or learning difficulties.

Subject: Dermatology

Which of the following deficiencies causes follicular hyperkeratosis?

- A. Vitamin A
- B. Vitamin C
- C. Vitamin E
- D. Vitamin B6

✅ *Correct Answer: 1*

🧠 Solution:
Correct Answer: A) Vitamin A Explanation: Follicular hyperkeratosis is characterized by dry, rough skin with small, keratotic papules around hair follicles, often seen in Vitamin A deficiency. This occurs due to abnormal keratinization of epithelial cells. Vitamin A Deficiency Manifestations : 1) Ocular manifestations : Vitamin A deficiency is the most significant preventable cause of blindness, especially in children below 5 in developing countries. Early Signs: Loss of sensitivity to green light. Difficulty adapting to dim light. Night blindness. Prolonged Deficiency: Xerophthalmia: Dry, thick, keratinized conjunctiva and cornea. If untreated, it leads to corneal ulceration and ultimately results in blindness due to the formation of opaque scar tissue. WHO grading of xerophthalmia: XN Night blindness. X1 X1A: Conjunctival xerosis. X1B: Bitot spots. X2 Corneal xerosis. X3 X3A: Corneal ulceration, less than one-third. X3B: Corneal ulceration, more than one-third. XS

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Corneal scar. XF Xerophthalmic fundus. Bitot's Spots: Grayish-white triangular plaques firmly adherent to the conjunctiva. Keratomalacia: When xerophthalmia persists for a longer time, it progresses to keratomalacia (corneal softening). 2) Immune Function: Deficiency increases susceptibility to infections. Infection reduces retinol-binding protein synthesis, lowering vitamin A levels and impairing immune responses. 3) Skin and Mucous Membrane Lesions: Follicular Hyperkeratosis (Phrynoderma): Causes rough skin due to hyperkeratinization of the follicular epithelium. Keratinizing Metaplasia: Affects respiratory, gastrointestinal, and genitourinary tracts. Epithelium is atrophied. 4) Other General Manifestation : Growth retardation due to defective synthesis of chondroitin sulfate. Decreased protein synthesis. Incorrect Options: Vitamin C Deficiency (Option B): Causes scurvy, leading to corkscrew hairs, perifollicular hemorrhages, and poor wound healing, but not follicular hyperkeratosis. Vitamin E Deficiency (Option C): Causes neurological symptoms (ataxia, peripheral neuropathy, hemolytic anemia) but does not affect keratinization. Vitamin B6 Deficiency (Option D): Leads to cheilitis, glossitis, irritability, and neuropathy, but not follicular hyperkeratosis.

Q. What nutritional deficiency is commonly associated with a chronic alcoholic presenting with a pruritic, eczematous rash on the neck and dorsum of the hands?

- A. Vit B3
- B. Vit B1
- C. Vit D
- D. Vit C

✅ *Correct Answer: 1*

🧠 Solution:
Correct Answer: A) Vit B3 Explanation: The patient is a chronic alcoholic with a pruritic, eczematous rash on the neck and dorsum of the hands, which is characteristic of pellagra—a disease caused by niacin (Vitamin B3) deficiency. Pellagra is characterized by the classic triad of symptoms: Dermatitis Bright red erythema- in sun-exposed areas (face, ankles, feet) Casal’s necklace- ↑pigmentation around the neck Diarrhoea, and Dementia. {{caption_text}} Causes of pellagra : Dietary Deficiency- Maize and Sorghum based diet Impaired Tryptophan Metabolism Factors Affecting Tryptophan to Niacin Conversion: Vitamin B6 Deficiency Medications: Isoniazid (INH), OCPs Hormonal Influences: Estrogen metabolites hinder tryptophan metabolism. Genetic Disorders: Inherited conditions like Hartnup disease can impede tryptophan absorption in the intestines and reabsorption in the kidneys Carcinoid Syndrome Other Contributing Factors: Alcoholism: Interferes with nutrient absorption, including niacin and tryptophan. Malabsorption Syndromes Incorrect Options: Vitamin B1 (Thiamine) Deficiency (Option B): Leads to Beriberi (wet/dry) and Wernicke-Korsakoff syndrome, which primarily causes neurological and cardiac symptoms rather than a rash. Vitamin D Deficiency (Option C): Causes rickets in children and osteomalacia in adults, presenting with bone pain and muscle weakness, but no skin rash. Vitamin C Deficiency (Option D): Leads to scurvy, characterized

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by bleeding gums, petechiae, impaired wound healing, and corkscrew hairs, but not the photosensitive rash seen in pellagra.

Q. A 45-year-old patient presents with itchy, flat-topped, polygonal, violaceous papules on the inner wrists and flexors surfaces of the forearms. The lesions have a characteristic shiny surface and are arranged in a linear pattern. The patient denies any recent medication changes. What is the treatment?

- A. Topical steroids
- B. Antibiotics
- C. Immunosuppressants
- D. Anti-fungal

✅ *Correct Answer: 1*

🧠 Solution:
Correct Answer: A) Topical steroids Explanation: The patient's itchy, flat-topped, polygonal, violaceous papules on the inner wrists and flexor surfaces of the forearms are characteristic of Lichen Planus (LP). Lichen Planus: Clinical Features 6 P’s → Pruritic, Purple, Polygonal, Planar Papules & Plaques Mucosal involvement → Wickham striae (reticular white lines) Koebner phenomenon: This phenomenon refers to the development of lesions at sites of trauma to uninvolved skin Histology → Sawtooth infiltrate of lymphocytes at the dermal-epidermal junction Association → Hepatitis C Treatment Topical (First-line for mild cases) Corticosteroids (Clobetasol, Betamethasone) Calcineurin Inhibitors (Tacrolimus, Pimecrolimus) – for oral/genital LP Antihistamines – for pruritus relief Local anesthetics (Lidocaine gel) – for painful oral lesions Intralesional (For hypertrophic LP) Intralesional corticosteroids (Triamcinolone injections) Systemic (For severe, widespread, or refractory cases) Oral corticosteroids (Prednisolone) Dapsone Hydroxychloroquine (HCQS) Azathioprine, Mycophenolate mofetil (MMF) Phototherapy (For generalized LP, especially in children) Narrow-band UVB (NBUVB) phototherapy

Subject: ENT

Q. A 50-year-old male presents with right-sided serous otitis media and a history of cervical lymphadenopathy. The probable diagnosis is?

- A. Angiofibroma
- B. Nasopharyngeal cancer
- C. Adenoid hypertrophy
- D. Tonsillar abscess

✅ *Correct Answer: 2*

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🧠 Solution:
Correct Option: B) Nasopharyngeal cancer Explanation: The question clearly hints of the elderly age along with right-sided serous otitis media and cervical lymphadenopathy which helps in the diagnosis of nasopharyngeal carcinoma. Clinical features: Nasal Obstruction Discharge Denasal speech (rhinolalia clausa) Epistaxis Otologic Conductive hearing loss Serous or suppurative otitis media (Unilateral serous otitis media in adults is an important indicator) Tinnitus Dizziness due to Eustachian tube obstruction Ophthalmoneurologic Squint Diplopia (CN VI involvement) Ophthalmoplegia (CN III, IV, VI) Facial pain Reduced corneal reflex (CN V involvement) Exophthalmos Blindness (CN II) Jugular foramen syndrome with CN IX, X, and XI involvement Horner syndrome Cervical Nodal Metastases Lump of nodes between the angle of the jaw and mastoid, or along the spinal accessory in the posterior triangle Distant Metastases Common sites-bone, lung, and liver Common symptoms Cervical lymphadenopathy Hearing loss Nasal obstruction Epistaxis Cranial nerve palsies (CN VI most common) Headache Earache Neck pain Weight loss Incorrect Options: Angiofibroma (Option A): Angiofibroma is seen in the juvenile age group which eliminates the option. Adenoid hypertrophy (Option C): Adenoid hypertrophy is not associated with cervical lymphadenopathy Tonsillar abscess (Option D): This is an infection and not tumor to be associated with cervical lymphadenopathy

Q. A 22-year-old male with recurrent bleeding, presents with bowing of posterior maxillary wall on CECT. All are false except?

- A. Outgrown the blood supply
- B. Tumor vessels lack contractility
- C. Bleeding is from the adjacent invading blood vessels
- D. It lacks capsule

✅ ***Correct Answer: 2***

🧠 Solution:
Correct Options: B) Tumor vessels lack contractility Explanation: The anterior bowing of the posterior wall of the maxillary sinus is called the Holman-Miller Sign This is seen in Juvenile nasal angiofibroma This tumor bleeds excessively because the tumor lacks smooth muscle that can contract. Examination of Juvenile nasopharyngeal angiofibroma (JNA) Anterior Rhinoscopy Reveals a reddish-purple mass obstructing the nasal passages, often with blood-stained discharge. Posterior Rhinoscopy Visualizes a smooth or lobulated mass in the nasopharynx using a small mirror. Oral Examination Assesses for tumor extension into the oral cavity, possibly pushing the soft palate downwards. Neck Palpation Detects any enlarged lymph nodes, especially in the upper cervical region. Neurological Examination Assesses cranial nerve involvement, focusing on eye movements, facial sensation, and hearing. Digital palpation Caution, avoid digital palpation of the nasopharyngeal mass to prevent severe bleeding. Investigations of Juvenile nasopharyngeal angiofibroma (JNA) Contrast-Enhanced CT Scan Investigation of choice; shows tumor size, location, and bony involvement. Pathognomonic sign: Holman-Miller sign (bowing of maxillary wall). Magnetic Resonance Imaging (MRI) Evaluates soft tissue and intracranial extension, differentiates

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between extradural and intradural spread. (Option A ruled out) Digital Subtraction Angiography (DSA) Visualizes tumor vascularity, identifies feeding vessels and aids in preoperative embolization to reduce surgical blood loss. Nasopharyngoscopy Provides a direct view of the tumor, but biopsy is generally avoided due to high bleeding risk. (Option C ruled out) Audiometry Assesses hearing loss caused by Eustachian tube obstruction; establishes baseline and monitors post-treatment hearing. Biopsy Biopsy is contraindicated due to risk of profuse bleeding. Incorrect Options: Outgrown the blood supply (Option A): Outgrown the blood supply is a wrong statement because JNA is an extremely vascular tumor. Bleeding is from the adjacent invading vessels (Option C): JNA has its blood supply which is most commonly by the internal maxillary artery. It lacks capsule (Option D): Capsule is associated with the extension of the tumor and not bleeding.

Subject: Forensic Medicine

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

- A. McNaughton rule
- B. Durham's rule
- C. Currens rule
- D. Irresistible impulse test

✅ ***Correct Answer: 1***

🧠 Solution:
Correct Option: A) McNaughton rule Explanation:McNaughton Rule is a legal standard used to determine whether a defendant is criminally responsible if they were suffering from a severe mental illness at the time of the crime. McNaughten Rule: The key principle states that every person is presumed sane until proven otherwise. To establish a defence of insanity, it must be proven that the accused, at the time of the act, had a mental disease that prevented them from understanding the nature of the act or recognising it as wrong. Legal Test of Insanity (Right or Wrong Test): A person is not criminally responsible if they did not know the nature of their act or that it was wrong at the time of the crime. Requirements include: Evidence of a mental disease. The mental disease must be present at the time of the crime. The condition must be severe enough to prevent understanding that the act is wrong or illegal. Criminal responsibility of insane persons rules: Durham’s Rule (1954): An accused is not criminally responsible if their unlawful act results from a mental disease or defect. (Option B ruled out) Curren’s Rule (1964): An accused is not criminally responsible if, due to a mental disease or defect, they were unable to regulate their conduct according to the law at the time of the act. (Option C ruled out) American Law Institute Test (1970): A person is not responsible for criminal actions if, due to mental disease or defect, they lack adequate capacity to understand the wrongfulness of their actions or to conform to legal requirements. Brawner Rule (1972): Insanity determinations should be made by a jury, which has the discretion to decide the "insanity question." The Irresistible

Impulse: This rule posits that an individual may recognize an act as illegal but, due to mental impairment, cannot control their actions. For example, Lorena Bobbitt was acquitted in 1994 by arguing that an irresistible impulse led her to commit her crime. (Option D ruled out)

Q. Acute liver failure is a clinical feature of which of the following?

- A. OP poisoning
- B. Amanita Phalloides poisoning
- C. Belladonna poisoning
- D. Morphine poisoning

✅ *Correct Answer: 2*

🧠 Solution:
Correct Option: B) Amanita Phalloides poisoning Explanation: Amanita poisoning causes acute liver failure. It is a wild mushroom known as the death cap mushroom. Amanita poisoning presents with nausea, vomiting, diarrhea, enlarged and tender liver, jaundice, oliguria , mental confusion, convulsions and coma Early mushroom poisoning Late mushroom poisoning Hallucinogenic mushroom poisoning Species Inocybe Amanita phalloides Amanita muscaria Toxin Muscarine Amatoxin (Option A) Muscimol Symptoms Cholinergic symptoms (DUMBBELLS) Hepatotoxicity Hallucinations, seizures Treatment Atropine Thioctic acid Silibinin (hepatoprotective) Supportive treatment ATROPINE CONTRAINDICATED OP poisoning (Option A) presents with pinpoint pupils and diaphoresis, liver failure is not seen Belladonna poisoning (Option C) presents with tachycardia, hallucinations not liver failure Morphine poisoning (Option D) presents with respiratory depression and pinpoint pupils, liver failure is not seen

Q. A family died in a closed room that was full of smoke from a wood fire. Which of the following findings is likely to be seen on the body?

- A. Cherry red hypostasis
- B. Cyanosis
- C. Blackish discoloration
- D. Brown colored pigmentation

✅ *Correct Answer: 1*

🧠 Solution:
Correct Option: A) Cherry red hypostasis Explanation: In this scenario, a family died in a closed room full of smoke from a wood fire, which likely caused carbon monoxide (CO) poisoning. Cherry-red post-mortem staining is a hallmark sign of carbon monoxide (CO) poisoning. Postmortem Staining in Poisoning Cases Postmortem staining (Livor mortis) is the skin discoloration after death due to blood settling in dependent areas. The color of the staining can indicate certain types of poisoning: Poison Postmortem Staining Characteristics

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Opium (Option C ruled out) Purple or blackish staining Carbon monoxide (Option A) Cherry red discoloration (COHb > 30%) Hydrogen sulfide Greenish discoloration in tissues Datura Asphyxial signs (no specific color) Organochlorine/Kerosene Asphyxial signs (no specific color) Phosphates, aniline, and nitrites (Option D ruled out) Brown-colored pigmentation Carbon Monoxide Physical Appearance Odourless, colorless, non-irritating gas, lighter than air Sources of Poisoning Incomplete combustion of almost of fuel (wood, charcoal, gas, kerosene) Automobile exhaust Fires: A common cause of accidental CO poisoning resulting in mass deaths - large building (hotel, theatre, block of flats, etc.) in flames Paint remover (especially methylene chloride) Tobacco smoke Normal CO level in plasma 1 to 5 % 7 to 8 % in smokers Mode of Action 230 to 270 times greater affinity for hemoglobin than oxygen Leftward shift of the oxyhemoglobin dissociation curve Reduced arterial oxygen content Inactivating mitochondrial cytochrome oxidase - cellular respiration is interfered CO-induced brain injuries are common in basal ganglia, cerebral white matter, hippocampus, and cerebellum. Clinical Features Depends on the concentration of CO in the blood CO exposure during pregnancy is teratogenic Diagnosis Carboxyhemoglobin level (COHb) in blood Arterial blood gases Treatment Oxygen (100%) through a tight-fitting mask or endotracheal tube, until COHb falls to 15 to 20% Hyperbaric oxygen: Inhalation of oxygen at a pressure greater than 1 atmosphere absolute Autopsy Findings Cherry red (pink) color of skin, inner aspects of lips, nail beds, tongue, palms and soles Cutaneous bullae (skin blisters) in the calves, buttocks, wrists, and knees Cherry pink color of blood and tissues Firmer white matter of the brain Necrosis and cavitation of basal ganglia Cyanosis (Option B) is not appreciated in CO poisoning.

Subject: Gynaecology & Obstetrics

Q. A 27-year-old pregnant female in her first trimester presents to the OPD for a regular antenatal checkup. During blood type screening, potential ABO incompatibility is discussed. The healthcare provider explains that certain antibody types are less concerning than others during pregnancy. ABO incompatibility does not occur due to which antibody in her case?

- A. IgA
- B. IgG
- C. IgD
- D. IgM

✅ *Correct Answer: 4*

🧠 Solution:
Correct Answer D) IgM Explanation: The clinical scenario addresses maternal-fetal ABO incompatibility and antibody transfer across the placenta: IgM antibodies cannot cross the placenta due to their large molecular size Placental transfer is selective and depends on antibody structure. Only IgG antibodies can effectively cross the placenta ABO incompatibility occurs primarily through IgG-mediated hemolysis IgA (Option A): While IgA

antibodies are not known to cross the placenta, it is not the primary antibody class that's excluded from crossing the placenta. IgG (Option B): IgG is the only antibody that is known to cross the placenta, making it the primary concern in blood type incompatibility. IgD (Option C): IgD antibodies are not known to cross the placenta, it is not the primary antibody class that's excluded from crossing the placenta.

Q. Identify the option with the least risk of TOLAC (trial of labor after cesarean)?

- A. Classical C section
- B. Pre-eclampsia
- C. Low-segment transverse incision
- D. Breech presentation

✅ ***Correct Answer: 3***

🧠 Solution:
Correct Answer: C) Low-segment transverse incision Explanation: Low-segment transverse incision has the lowest risk for uterine rupture during trial of labor after cesarean (TOLAC). Incision location: Lower uterine segment Direction: Horizontal (transverse) Healing characteristics: Better wound healing Scar strength: Superior to classical incision Clinical Significance: Lower rupture risk during subsequent pregnancies Better healing due to less contractile portion of uterus Preferred technique for primary cesarean sections Favorable for future TOLAC Classical C section (Option A): This vertical incision through the contractile portion of the uterus carries a significantly higher risk of uterine rupture (4-9%) during TOLAC. The location and direction of this incision make it a contraindication for future vaginal delivery attempts. Pre-eclampsia (Option B): This is a medical condition that affects pregnancy but has no direct relationship to the type of uterine incision or TOLAC risk. Pre-eclampsia is a separate consideration in pregnancy management and doesn't inherently affect TOLAC decision-making. Breech presentation (Option D): This refers to fetal positioning and is not related to the type of uterine incision or its associated risks in TOLAC. While breech presentation may influence delivery decisions, it doesn't directly impact the risk of uterine rupture during TOLAC.

Q. Identify the given instrument?

- A. Graves vaginal speculum
- B. Cusco vaginal speculum
- C. Sims speculum
- D. Auvard speculum

✅ ***Correct Answer: 2***

🧠 Solution:
Correct Answer: B) Cusco vaginal speculum Explanation: The image shows a Cusco vaginal speculum, a commonly used instrument in gynecological examinations. Key Features: Design: Bivalve speculum with two symmetrical blades Material: Stainless steel Mechanism:

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Self-retaining with adjustable width Operation: Opens in an anterior-posterior direction Clinical Applications: Visualization of cervix Vaginal examination Pap smear collection IUD insertion Graves vaginal speculum (Option A): Has wider blades than Cusco Uses- Performing pelvic & cervical examinations Pap Smears Inserting IUCD Sims speculum (Option C): {{caption_text}} L-shaped design with one side longer than the other. Uses- Inspect cervix and vagina post-delivery Clean vagina following delivery Inspect for local causes of APH (bleeding) Used during D&E operations Collection of samples (blood, urine in VVF) Auvard speculum (Option D): Weighted speculum Self-retaining via weighted mechanism Uses- Posterior vaginal wall retraction during operations Used in anterior colporrhaphy Used in vaginal hysterectomy

Q. Which among the following hormones acts on post ovulatory endometrium?

- A. Luteinizing hormone
- B. Follicular stimulating hormone
- C. Progesterone
- D. Oestrogen

✅ ***Correct Answer: 3***

🧠 Solution:
Correct Answer: C) Progesterone Explanation: Progesterone is produced by the corpus luteum and plays a key role in preparing the endometrium for potential implantation during the post-ovulatory (luteal) phase of the menstrual cycle. Hormonal Actions: Promotes endometrial secretory changes Maintains endometrial thickness Essential for early pregnancy maintenance Luteinizing hormone (Option A): LH primarily triggers ovulation through the LH surge and supports corpus luteum formation. It does not directly act on the endometrium. LH's main role is in follicular development and ovulation. Follicular stimulating hormone (Option B): FSH is responsible for follicular development and estrogen production during the proliferative phase. It has no direct action on post-ovulatory endometrium. Its primary role occurs before ovulation in follicle development. Oestrogen (Option D): While estrogen is crucial for endometrial proliferation in the first half of the menstrual cycle, it is not the primary hormone acting on post-ovulatory endometrium. Estrogen's main effects occur during the proliferative phase, before ovulation.

Q. Identify the condition that is least likely to cause postmenopausal bleeding?

- A. Endometrial CA
- B. Granulosa cell tumor
- C. Genital tract trauma
- D. Ovarian follicular cyst

✅ ***Correct Answer: 4***

🧠 Solution:
Correct Answer: D) Ovarian follicular cyst Explanation: Ovarian follicular cysts are the least

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likely cause of postmenopausal bleeding among the given options. Endometrial CA (Option A): This is one of the most common causes of postmenopausal bleeding, accounting for approximately 10% of cases. Any postmenopausal bleeding must be evaluated to rule out endometrial cancer as it is often the first sign of the disease. Granulosa cell tumor (Option B): This is an estrogen-producing ovarian tumor that can cause endometrial hyperplasia and subsequent bleeding. The excess estrogen production stimulates the endometrium, potentially leading to irregular bleeding even in postmenopausal women. Genital tract trauma (Option C): While not as common as endometrial cancer, trauma to the genital tract can cause bleeding at any age. This may occur due to injury during intercourse, medical procedures, or other traumatic events to the genital area.

Subject: Medicine

Q. An 8-year-old child with a history of GTCS came with an episode of convulsions for more than 45 minutes. What will be the appropriate management for this patient?

- A. Lorazepam followed by levetiracetam
- B. Valproate followed by gabapentin
- C. Carbamazepine followed by lorazepam
- D. Levetiracetam followed by valproate

✅ ***Correct Answer: 1***

🧠 Solution:
Correct Answer: A) Lorazepam followed by levetiracetam Explanation: Status epilepticus (SE) is defined as continuous seizures or repetitive, discrete seizures with impaired consciousness lasting more than 30 minutes. They are generally of 2 types: Generalized convulsive status epilepticus (GCSE) GCSE is an emergency and must be treated immediately (e.g., persistent, generalized electrographic seizures, coma, and tonic-clonic movements). Nonconvulsive status epilepticus (NCSE) E.g., persistent absence seizures or focal seizures with confusion or partially impaired consciousness, and minimal motor abnormalities. In the case of impending and early SE, the standard protocol involves administering IV lorazepam 0.1 mg/kg followed by levetiracetam 20-30 mg/kg. For established and early refractory SE, the treatment progresses to Propofol 2 mg/kg IV followed by 2-10 mg/kg/hr with the addition of anticonvulsants like levetiracetam. Management of Status Epilepticus: Valproate followed by gabapentin (Option B): While valproate can be used in the treatment of GTCS, this combination is not the standard first-line treatment for status epilepticus. Gabapentin is typically used for chronic seizure management rather than acute status epilepticus. Carbamazepine followed by lorazepam (Option C): Carbamazepine is primarily used in the treatment of partial or focal seizures and is not appropriate for acute status epilepticus. Additionally, benzodiazepines should be administered first in status epilepticus, not after other anticonvulsants. Levetiracetam followed by valproate (Option D): This sequence is incorrect as benzodiazepines (lorazepam) should be the first-line treatment in early status epilepticus.

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Q. A patient having hypertension is on thiazides and is complaining of fatigue and hypokalemia. Which of the following drugs can prevent potassium loss?

- A. Furosemide
- B. Amiloride
- C. Acetazolamide
- D. Indapamide

✅ ***Correct Answer: 2***

🧠 Solution:
Correct Answer: B) Amiloride Explanation: Amiloride is a potassium-sparing diuretic that acts by inhibiting the epithelial sodium channel (ENaC) in the distal nephron. When used in combination with thiazide diuretics, it helps prevent hypokalemia while maintaining Thiazide’s antihypertensive efficacy. This combination approach is particularly useful in patients experiencing thiazide-induced hypokalemia. Amiloride works as a weak antihypertensive but is valuable for its potassium-sparing properties, though it should be used cautiously in patients with renal failure or hyperkalemia. Classification of Diuretics : Type Mechanism of action Examples Clinical uses Side effects Carbonic anhydrase inhibitors Inhibit carbonic anhydrase enzyme in the proximal tubule, decreasing bicarbonate reabsorption Acetazolamide, Methazolamide Glaucoma, Altitude sickness Metabolic acidosis, Hypokalemia Loop diuretics Inhibit the Na-K-2Cl symporter in the thick ascending loop of Henle Furosemide, Bumetanide Acute pulmonary edema, Chronic heart failure, Hypercalcemia Hypokalemia, Ototoxicity, Metabolic alkalosis, Hyperglycemia, Hyperuricemia Thiazide diuretics Inhibit sodium reabsorption in the distal convoluted tubule Hydrochlorothiazide, Chlorthalidone Hypertension, Edema Hypokalemia, Hyponatremia, Hyperglycemia Hyperuricemia Potassium-sparing Inhibit sodium channels in the distal nephron or block aldosterone receptors Spironolactone, Amiloride Heart failure, Hyperaldosteronism Hyperkalemia, Gynecomastia (for Spironolactone) Osmotic diuretics Increase osmolarity of the glomerular filtrate, inhibiting water reabsorption. Mannitol, Glycerin Cerebral oedema, Acute glaucoma Dehydration, Electrolyte imbalance Furosemide (Option A): This is a loop diuretic that actually increases potassium excretion and can worsen hypokalemia. It is primarily used in patients with reduced GFR, CHF, or conditions requiring significant sodium excretion. Acetazolamide (Option C): This carbonic anhydrase inhibitor is mainly used for treating glaucoma, altitude sickness, and periodic paralysis. It does not prevent potassium loss and can actually contribute to electrolyte imbalances. Indapamide (Option D): This thiazide-like diuretic, similar to traditional thiazides, can cause potassium depletion and would not help prevent hypokalemia. It shares the same mechanism of action and side effect profile as other thiazide diuretics.

Subject: Microbiology

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Q. A 6-month-old boy presents with recurrent bacterial and fungal infections, chronic diarrhea, and failure to thrive. He is diagnosed with severe combined immunodeficiency due to an autosomal recessive inheritance pattern. Which enzyme deficiency is responsible?

- A. Phosphomannose isomerase
- B. Ornithine transcarbamylase
- C. Hypoxanthine-guanine phosphoribosyltransferase
- D. Adenosine deaminase

✅ ***Correct Answer: 4***

🧠 Solution:
Correct Answer: D) Adenosine deaminase Explanation: The patient’s symptoms—recurrent bacterial and fungal infections, chronic diarrhea, and failure to thrive—are characteristic of Severe combined immunodeficiency (SCID). SCID is a condition where there is a severe deficiency in both T-cell and B-cell function, leading to an increased susceptibility to infections. One of the most common causes of SCID is a deficiency in adenosine deaminase (ADA), an enzyme involved in purine metabolism. A deficiency in ADA results in toxic accumulation of adenosine and deoxyadenosine, which primarily affects T-cells and B-cells, leading to immune dysfunction. Phosphomannose isomerase (Option A): A deficiency in this enzyme leads to congenital disorders of glycosylation, which can present with developmental delay, but it is not associated with SCID. Ornithine transcarbamylase (Option B): This enzyme deficiency leads to urea cycle disorders, specifically hyperammonemia, which does not cause SCID or the described immune symptoms. Hypoxanthine-guanine phosphoribosyltransferase (HGPRT) (Option C): A deficiency in HGPRT causes Lesch-Nyhan syndrome, characterized by neurological and behavioral problems, gout, and kidney stones, but not SCID.

Q. A 10-year-old boy is brought to the ED after being stung by a bee while playing outside. Within minutes of the sting, he developed shock, respiratory failure, and vascular collapse. What type of hypersensitivity reaction is most likely responsible?

- A. IgG-mediated reaction
- B. IgA-mediated hypersensitivity
- C. IgE-mediated reaction
- D. T cell-mediated response

✅ ***Correct Answer: 3***

🧠 Solution:
Correct Answer: C) IgE-mediated reaction Explanation: The symptoms described—shock, respiratory failure, and vascular collapse—occur within minutes of a bee sting, which is a classic presentation of an allergic reaction triggered by IgE-mediated hypersensitivity (also known as Type I hypersensitivity). This reaction is commonly referred to as anaphylaxis. Type I Hypersensitivity (Early), is an immediate reaction triggered by IgE-mediated mast cell degranulation, causing symptoms like hives,

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swelling, and respiratory distress within minutes of allergen exposure. Other options describe features inconsistent with her presentation and typical of delayed hypersensitivity types (I (Delayed), III, and IV), which have different mechanisms and symptom timelines. Type I hypersensitivity reaction phases and its features: Phase Timing Mechanism Clinical Features Early Phase Seconds to minutes Mast cell/basophil degranulation: IgE cross-linking leads to the release of histamine and other mediators. Skin: Urticaria (hives), itching (pruritus), erythema (redness), localized angioedema (swelling around lips, eyes) Respiratory: Bronchoconstriction leading to wheezing, shortness of breath, chest tightness, sneezing, nasal congestion (allergic rhinitis) Cardiovascular: Vasodilation and hypotension (drop in blood pressure), dizziness, syncope (fainting) Gastrointestinal: Nausea, vomiting, abdominal pain, diarrhea due to smooth muscle contraction Systemic Reaction: Anaphylaxis in severe cases, with generalized urticaria, angioedema, severe hypotension, and respiratory distress (life-threatening) Late Phase 4–12 hours, peaks at 24–48 hours, lasting up to days Inflammatory cell recruitment: Cytokines/chemokines attract eosinophils, neutrophils, and macrophages, causing sustained inflammation. Skin: Persistent redness, swelling, intense itching, and development of an eczema-like rash (seen in atopic dermatitis) Respiratory: Recurrent bronchoconstriction, prolonged wheezing, coughing, chest tightness, mucus production, and airway hyperresponsiveness (chronic asthma exacerbation) Eyes: Persistent redness and irritation in conjunctiva (allergic conjunctivitis) Chronic Changes: In prolonged or recurrent reactions, there may be tissue remodeling, fibrosis, and thickening of affected areas (e.g., airways in asthma, skin in chronic dermatitis) Types of hypersensitivity reactions and their features: Type Mechanism Clinical Features Onset Type I Early IgE-mediated mast cell degranulation Hives, swelling, respiratory distress Immediate (minutes) Type I Delayed IgE-mediated mast cell degranulation Wheezing, chest tightness, localized itching Hours to days Type II Antibody-mediated cell destruction Hemolytic anemia, thrombocytopenia Delayed (hours to days) Type III Immune complex deposition Joint pain, fever, vasculitis Delayed (hours to days) Type IV T-cell mediated response (Option D ruled out) Skin rash, contact dermatitis Delayed (48-72 hours) {{caption_text}} IgG-mediated reaction (Option A): This is typical of Type II hypersensitivity reactions (such as hemolytic anemia), which involve antibody binding to antigens on cells or tissues, leading to cell destruction. It is not associated with anaphylaxis. IgA-mediated hypersensitivity (Option B): This is involved in Type III hypersensitivity (e.g., in conditions like immune complex disease), where antibody-antigen complexes form and cause inflammation, but it is not the cause of anaphylaxis.

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Subject: Ophthalmology

Q. A 32-year-old patient presents with blurred vision, photophobia, and mild ocular pain. Examination reveals aqueous flares and keratic precipitates in the anterior chamber. What is the likely diagnosis?

- A. Intermediate uveitis
- B. Posterior uveitis
- C. Toxoplasma uveitis

- D. Iridocyclitis

✅ *Correct Answer: 4*

🧠 Solution:
Correct Answer: D) Iridocyclitis Explanation: Type of Uveitis Signs Anterior (Option D) Granulomatous iridocyclitis, iris nodules, large mutton fat KPs, anterior chamber cells and flare, posterior synechiae Intermediate (Option A) Vitreous cells, snowball opacities, snowbanking Posterior (Option B) Choroidal and retinal granulomas, cystoid macular edema, periphlebitis retinae with candle wax droppings appearance Peripheral Multifocal Chorioretinitis Small, punched-out atrophic spots, highly suggestive of sarcoidosis Uveoparotid Fever (Heerfordt’s Syndrome) Bilateral granulomatous panuveitis, painful parotid gland enlargement, cranial nerve palsies, skin rashes, fever, malaise Toxoplasma uveitis (Option C): Definitive host: Cat; Intermediate host: Human Ocular features: granulomatous or non-granulomatous uveitis Primarily it is posterior uveitis and spreads to anterior

Q. Optic nerve glioma is seen in?

- A. NF-1
- B. Tuberous sclerosis
- C. NF-2
- D. Schwannoma

✅ *Correct Answer: 1*

🧠 Solution:
Correct Answer: A) NF-1 Explanation:Optic nerve gliomas usually present with proptosis, visual loss, and optic nerve swelling, but not typically with leukocoria or an intraocular mass with calcification. Various conditions other than retinoblastoma, which present as leukocoria are collectively called pseudoglioma. Differential diagnosis of Retinoblastoma Leukocoria Congenital cataract Inflammatory deposits in vitreous following a plastic cyclitis or choroiditis, Coloboma of the choroid, Retinopathy of prematurity Persistent hyperplastic primary vitreous Toxocara endophthalmitis Exudative retinopathy of Coats Endophytic retinoblastoma Tuberous sclerosis Neurofibromatosis-1 (Option A) Astrocytoma Exophytic Retinoblastoma Exudative retinopathy of Coats Options B, C, and D are incorrect. Optic nerve glioma is not associated with these conditions.

Subject: Orthopaedics

Q. A patient experienced a fall onto an outstretched hand, and an X-ray revealed a fracture of the first metacarpophalangeal (MCP) joint with accompanying subluxation. Define this type of fracture.

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- A. Bennett’s fracture
- B. Scaphoid fracture
- C. Reverse Colle’s fracture
- D. Colle’s fracture

✅ *Correct Answer: 1*

🧠 Solution:
Correct Option: A) Bennett’s fracture Explanation: Bennett’s fracture is an oblique intra-articular fracture dislocation at the base of the first metacarpal bone (the thumb). Bennett fracture: Oblique intra-articular fracture (2 part) of the base of the first metacarpal with subluxation of the metacarpal. It is caused by a longitudinal force applied to the thumb. Treatment: Closed reduction and percutaneous K-wire fixation Open reduction and internal fixation {{caption_text}} {{caption_text}} Scaphoid (Options B) occurs from a fall on a dorsiflexed hand, typically affecting the waist of the scaphoid, and is characterised by pain and tenderness in the anatomical snuff box (the scaphoid fossa). Reverse Colle’s fracture (Options C) involves a fracture at the distal end of the radius. Colle’s fracture (Options D) is due to fracture of radius and presents with Dinner-fork deformity

Q. A 17-year-old boy presents to the clinic complaining of a painless lump on the lateral aspect of his left knee. The radiograph of the patient is shown below. Which of the following is the most likely diagnosis?

- A. Enchondroma
- B. Osteosarcoma
- C. Osteomyelitis
- D. Osteochondroma

✅ *Correct Answer: 4*

🧠 Solution:
Correct Option: D) Osteochondroma Explanation: Osteochondroma, also known as exostosis, is characterized by an exophytic growth from the bone. This type of growth appears as a cauliflower-like structure in imaging studies. Osteochondroma: Benign cartilaginous neoplasms arising from physeal cartilage beneath the periosteum. Growth via enchondral ossification, similar to normal bone development. More common in males, usually appearing during adolescence. Affects long bones, especially the femur and humerus. Clinical Presentation Usually presents as a painless mass. Symptoms may include: Formation of a bursa due to friction. Activity-related discomfort. Rare symptoms: Neuropathic pain from nerve compression. Sudden pain due to fracture. Factors affecting malignant transformation: Larger lesions with thicker cartilage caps (especially >1.5 cm). More common in trunk lesions, and rare in extremities. Suspicious changes in size or pain after skeletal maturity in MO patients. Radiographic Appearance Bony protuberance with

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well-defined borders. Key radiographic features: Cortex flaring into the osteochondroma. (Option B) Thin outer cortex with inner cancellous structure. Pedunculated (cauliflower-like summit) or broad sessile base. Pedunculated lesions point away from the joint toward the diaphysis. {{caption_text}} MRI findings: Cartilaginous cap thickness, generally thicker in children and thins with age. {{caption_text}} {{caption_text}} Enchondroma (Options A) presents with Asymmetric limb shortening, Swelling of fingers/toes and impaired movement of interphalangeal joints Osteosarcoma (Options B) Sun-rays appearance is typically seen in osteosarcoma. Osteomyelitis (Options D) shows periosteal new bone formation (periosteal reaction) by 7-10 days

Q. Identify the type of fracture in a patient who sustained a road traffic accident resulting in fractures of both the tibia and fibula.

- A. Bumper Fracture
- B. Patella sleeve fracture
- C. Depressed skull fracture
- D. Cervical fracture

✅ ***Correct Answer: 1***

🧠 Solution:
Correct Option: A) Bumper fracture Explanation: A bumper fracture refers specifically to a lateral tibial plateau fracture, which commonly occurs in road traffic accidents. This type of fracture often involves both the tibia and fibula. Classification of Tibial Plateau Fracture The tibial plateau refers to the proximal tibial surface, which comprises the medial and lateral articular surfaces of the respective tibial condyles. Lateral tibial plateau fractures are the most common. Mechanism of Injury The main mechanism of injury is a varus or valgus force, with or without axial load. Young Adults: Road traffic accidents, leading to split fractures (high ligament injury risk). Elderly: Trivial falls, causing depression or split depression fractures (associated with osteoporosis) (low ligament injury risk). Classification (Schatzker) Type I: Lateral plateau split fracture (young adults). Type II: Lateral plateau split depression (young adults). Type III: Lateral plateau pure depression (elderly). Type IV: Medial plateau fracture. Type V: Bicondylar fracture. Type VI: Dissociation of metaphysis and diaphysis. Clinical Features Knee swelling due to hemarthrosis. Inability to bear weight Reduce range of knee movements Compartment syndrome (earliest sign: stretch pain). Imaging X-ray: Initial fracture detection. {{caption_text}} {{caption_text}} {{caption_text}} CT with 3D Reconstruction: Gold standard. MRI: To assess ligament injuries. Management Non-surgical: Stable fractures with minimal displacement. Surgical (ORIF): For displaced fractures or significant depression. Ligament reconstruction if needed. Patella sleeve fracture (Options B) This injury generally occurs from direct trauma to the front of the knee or from a fall, and while possible in road traffic accidents, it is less likely in this case where the deformity and mechanism suggest lateral tibial plateau involvement. Depressed skull fracture (Options C) Typically caused by small objects impacting the skull at high velocity. Cervical fracture (Options D) do not involve fracture of both tibia and fibula.

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Subject: PSM

Q. Rukmini is attending the village health nutrition and sanitation program day. How frequently is this conducted?

- A. Every month
- B. Every week
- C. Every 14 days
- D. Every 3 months

✅ *Correct Answer: 1*

🧠 Solution:
Correct Option: A) Every month Explanation: The Village Health Nutrition and Sanitation Day (VHND) is scheduled to take place once every month, preferably on Wednesdays. In cases where certain villages have been missed, the VHND can be organized on any other day within the same month to ensure uniformity. The Anganwadi Center (AWC) is designated as the central location for hosting the VHND, serving as a hub for service provision under various health programs such as RCH-II and NHM. During the VHND, community health workers like ASHAs and AWWs mobilize villagers, with a particular focus on women and children, to gather at the nearest AWC. At the event, villagers have the opportunity to receive basic health services, and gain valuable information on preventive and promotive healthcare practices.

Q. Arrange the order of the Disaster management cycle

- A. Impact-response-rehabilitation-mitigation
- B. Rehabilitation-response-impact-mitigation
- C. Response-disaster-rehabilitation-mitigation
- D. Impact-mitigation-response-rehabilitation

✅ *Correct Answer: 1*

🧠 Solution:
Correct Option: A) Impact-response-rehabilitation-mitigation Disaster management cycle: The three fundamental aspects of disaster management: Disaster impact: Involves disaster response and relief. Disaster preparedness: It is the proper equipment of the country to manage disasters. Disaster mitigation: Preventing the hazard from becoming a disaster.

Q. The needle with the syringe is disposed of in which container?

- A. Yellow
- B. Red
- C. Blue
- D. White

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✅ *Correct Answer: 4*

🧠 Solution:
Correct Option: D) White Explanation: Needle with a syringe/syringes with fixed needles should be disposed of in a white puncture proof, tamper-proof bag/container. Colour Type of waste Example of waste Treatment and disposal Yellow (Option A) Human anatomical waste. Animal anatomical waste. Soiled waste. Discarded or expired medicine. Microbiology, biotechnology and other clinical laboratory waste. Chemical waste. Chemical liquid waste. Placenta. Post-operative body parts. Plaster of Paris (POP). Pathological waste. Cotton waste. Dressing materials. Beddings. Body fluid contaminated paper and cloth. Face mask, cap, shoe cover and head cover. Cytotoxic, expired and discarded medicines. Microbiology and biotechnology lab waste. Blood bag Vacutainers with blood Incineration. Plasma pyrolysis. Deep burial. Red (Option B) Contaminated waste that is recyclable. Syringe without needles. Fixed needle syringes with their needle cut. IVset. Catheters. Gloves (soiled or unsoiled). Urine bag. Dialysis kit. IVbottles. Tubing's. Bottles. Vacutainers with needle cut. Vacutainers without blood. ELISA plate and vials not containing blood samples. Autoclaving or microwaving/ hydroclaving followed by shredding or mutilation and waste set to registered recyclers or for energy recovery/road making. Plastic waste should not be sent to landfill sites. White (Option D) Waste Sharps Needles Syringes with fixed needles Blades Scalpers Trocar cannula Insulin pen needle Puncture proof , Leak proof, Tamper proof containers Autoclaving or dry heat sterilization followed by shredding or mutilation or encapsulation in metal container or cement concrete Or sent for final disposal to iron foundries or sanitary landfill or designated concrete waste sharp pit Blue (Option C) Glassware or metallic body implants. Includes broken or discarded glass and metallic objects that are contaminated. Glass: Broken glass. Ampoules. Lab slide Metals: Nails. Metallic body implants. Scissors. Artificial pacemakers. Cardboard boxes with blue coloured marking or blue coloured puncture- proof and tamper-proof containers. Disinfection (cleaning with detergent and soaking in sodium hypochlorite) or autoclaving or microwaving or hydroclaving and then sent for recycling.

Q. Which of the following is not a part of the global hunger index?

- A. U5MR
- B. Malnutrition
- C. Inadequate food supply
- D. Infant mortality rate

✅ *Correct Answer: 4*

🧠 Solution:
Correct Option: D) Infant mortality rate Explanation: The Global Hunger Index (GHI) does not include the Infant mortality rate. It measures three dimensions of hunger: Food availability (Option C), Child's nutritional status (Option B) and Child mortality due to undernutrition It includes three equally weighted indicators: The proportion of people who

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are food energy-deficient (FAO estimates) Prevalence of underweight children under 5 years (WHO data) Mortality rate of children under 5 years (UNICEF reports) (Option A)

Q. Iron absorption is decreased in which of the following?

- A. Amla
- B. Sprouting
- C. Tea
- D. Lemon

✅ *Correct Answer: 3*

🧠 Solution:
Correct Option: C) Tea Tannin in tea interferes with iron absorption. Sources rich in iron: Two types: haem-iron and non-haem iron. Haem iron Haem iron is better absorbed than non-haem iron. Found in liver, meat, poultry, and fish. Promotes absorption of non-haem iron in plant foods eaten concurrently. Non-Haem iron: It is found in plant-based foods such as cereals, green leafy vegetables, legumes, nuts, oilseeds, jaggery, and dried fruits. Additional Iron Sources: Cooking in iron vessels can significantly contribute to dietary iron in some areas. Iron Content in Milk: Low in all mammalian species. Breast milk contains less than 0.2 mg/dL but has good bioavailability. Bioavailability and Absorption Inhibitors: Non-haem iron absorption is hindered by phytates, oxalates, carbonates, phosphates, and dietary fibre. Foods like milk, eggs, and tea also inhibit iron absorption. Indian vegetarian diets often contain high levels of these inhibitors (e.g., phytates in bran, phosphates in egg yolk, tannin in tea, and oxalates in vegetables). Incorrect Options: Amla (Option A): Vitamin C in Amla is the promoter of iron absorption Sprouts (Option B): Sprouting promotes iron absorption. Lemon (Option D): Vitamin C in Lemon is the promoter of iron absorption

Subject: Pathology

Q. Which of the following is the investigation of choice for CML?

- A. LAP score
- B. FISH
- C. Karyotyping
- D. Reciprocal translocation

✅ *Correct Answer: 2*

🧠 Solution:
Correct Answer: B) FISH Explanation: Fluorescence in situ hybridisation (FISH) is the choice of investigation for detecting the Philadelphia chromosome in CML. It makes a cytogenetic analysis of the Philadelphia chromosome. The presence of the Philadelphia chromosome, resulting from the reciprocal translocation between chromosomes 9 and 22 [t(9;22)(q34;q11)], or detection of the BCR-ABL1 fusion gene on mRNA, confirms the diagnosis of CML. Diagnosis of Chronic Myeloid Leukemia (CML) CBC Normal RBC +

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Elevated TLC + Elevated platelets Peripheral smear Left shift with predominant segmented neutrophils, myelocytes, and metamyelocytes. College girl/garden party appearance: Due to non-uniform appearance (every cell appears different). {{caption_text}} Bone marrow aspirate Increased Myeloid: Erythroid ratio. Dwarf megakaryocytes. Sea blue histiocytes (blue-coloured cytoplasm) Pseudo Gaucher cells {{caption_text}} The image shows Pseudo-Gaucher cells NAP (Neutrophil Alkaline Phosphatase)/LAP score (Leukocyte Alkaline Phosphatase) (Option A ruled out) Decreased FISH (IOC) (Option B) Confirms t(9:22) translocation. Analysis to quantify Philadelphia chromosome-positive cells. Estimates the tumour load. {{caption_text}} The image shows BCR-ABL gene fusion (red + green) in fluorescence in-situ hybridisation (FISH; the ABL gene is red, and the BCR gene is green). PCR To quantify BCR-ABL-1 It can be a false negative or false positive False negative: Early part of the disease Karyotyping (Option C) examines chromosomes to detect abnormalities like Down syndrome or the Philadelphia chromosome in CML. While it can identify chromosomal abnormalities, it is less sensitive than FISH for detecting the Philadelphia chromosome. Reciprocal translocation (Option D) is a chromosomal abnormality where segments of two chromosomes are exchanged, such as the Philadelphia chromosome in CML. It results in the BCR-ABL fusion gene, detectable by FISH or karyotyping, but is not an independent diagnostic test.

Q. A 5-year-old child presents with a lesion in the right eye. Histopathology reveals the presence of Flexner-Wintersteiner rosettes. What is the likely diagnosis?

- A. Retinoblastoma
- B. Optic nerve glioma
- C. Rhabdomyosarcoma
- D. Ocular melanoma

✅ ***Correct Answer: 1***

🧠 Solution:
Correct Answer: A) Retinoblastoma Explanation: The presence of a lesion in the right eye and histopathological findings of Flexner-Wintersteiner rosettes strongly suggest a diagnosis of Retinoblastoma. Retinoblastoma It is caused by the inactivation of both alleles of the RB1 tumour suppressor gene. Types Heritable (germline): It frequently leads to bilateral retinoblastoma and is caused by a germline mutation in the RB1 gene in all cells, followed by a somatic mutation in the retinal cells. Affected individuals are also at increased risk for developing non-ocular tumours, such as osteosarcoma. Non-heritable (sporadic): This form typically presents as a unilateral tumour and results from two somatic mutations in the retinal cells occurring after embryonic development, without a germline mutation. It is not inherited and does not carry an increased risk of developing non-ocular tumours. Clinical features Occurs in young children, usually before 5 years of age (most common ocular neoplasm in children). Leukocoria: White pupillary reflex (most common presenting sign of retinoblastoma). Strabismus Painful red eye Poor vision Asymptomatic Fundus

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examination A white, elevated mass in the retina is characteristic of retinoblastoma Genetic testing RB1 gene mutation on chromosome 13q14 Histopathology Flexner-Wintersteiner rosettes (highly specific): These are composed of an ‘empty’ lumen surrounded by columnar cells. Homer-Wright rosettes: These are pseudo-rosettes and consist of cells surrounding a central lumen made up of their processes. Undifferentiated tumour cells. Areas of necrosis and calcification. {{caption_text}} Optic nerve glioma (Option B) is a benign tumour that arises from the glial cells of the optic nerve. It is most commonly seen in children and is often associated with neurofibromatosis type 1. Symptoms may include vision loss, proptosis, and visual field defects. It typically occurs along the optic nerve and does not exhibit Flexner-Wintersteiner rosettes. Rhabdomyosarcoma (Option C) is a malignant soft tissue sarcoma that originates from skeletal muscle cells or their precursors. It is most common in children and can occur in various locations, including the head and neck, genitourinary tract, and extremities. Symptoms depend on the tumour's location but often include a painless mass or swelling. It affects the eye but does not show these characteristic rosettes. Ocular melanoma (Option D) is a rare malignant tumour that develops in the pigment-producing cells (melanocytes) of the eye, most commonly in the choroid (part of the eye's vascular layer). It is more common in adults and can lead to symptoms like vision changes, dark spots in the field of vision, and proptosis.

Q. Which among the following is the least radiosensitive cell?

- A. Monocytes
- B. Platelets
- C. Lymphocytes
- D. Neutrophils

✅ ***Correct Answer: 2***

🧠 Solution:
Correct Answer: B) Platelets Explanation: Among the given options, platelets are the least radiosensitive cells. Radiosensitivity refers to the susceptibility of cells or tissues to the effects of radiation. Cells with higher rates of proliferation and less differentiation tend to be more radiosensitive because they are actively dividing and thus more vulnerable to the damaging effects of radiation. Platelets are the least radiosensitive as they do not divide actively. Order of Radiosensitivity: Lymphocytes > neutrophils ~ monocytes > platelets

Q. Which HLA is associated with Reiter syndrome?

- A. HLA-DR3
- B. HLA-B27
- C. HLA-DQ8
- D. HLA- DR4

✅ ***Correct Answer: 2***

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🧠 Solution:
Correct Answer: B) HLA-B27 Explanation: Reiter Syndrome (also known as Reactive Arthritis) is associated with HLA-B27. It is defined by the triad of: Arthritis Nongonococcal urethritis or cervicitis Conjunctivitis Etiology: It occurs days to weeks after genitourinary (Chlamydia) or gastrointestinal (Shigella, Salmonella, Yersinia, Campylobacter, and Clostrdioides difficile) infections. HIV-positive patients may also be affected. Clinical features: Onset: Acute Enthesitis, oligoarthritis and/or spinal inflammation. Lower limb joints and entheses are predominantly affected. Systemic disturbances like fever and weight loss. Achilles insertional enthesitis/tendonitis or plantar fasciitis may also be present. The first attack of arthritis is usually self-limiting, but recurrent or chronic arthritis can develop. Low back pain and stiffness (due to enthesitis and osteitis) Sacroiliitis Extra-articular features: Circinate balanitis: Starts as vesicles on the coronal margin of the prepuce and glans penis, later rupturing to form superficial erosions with minimal surrounding erythema, some coalescing to give a circular pattern. Keratoderma blennorrhagica: Begins as discrete waxy, yellow-brown vesico-papules with desquamating margins, occasionally coalescing to form large crusty plaques on the palms and soles of the feet. Pustular psoriasis Nail dystrophy with subungual hyperkeratosis Mouth ulcers Conjunctivitis Uveitis HLA-DR3 (Option A) is associated with autoimmune diseases such as Systemic Lupus Erythematosus (SLE), Type 1 diabetes, and Graves' disease, but it is not linked to Reiter's Syndrome (Reactive Arthritis), which is specifically associated with HLA-B27. HLA-DQ8 (Option C) is associated with Celiac disease and some autoimmune disorders, such as Type 1 diabetes, but it is not linked to Reiter's Syndrome. HLA-DR4 (Option D) is associated with autoimmune conditions such as Rheumatoid Arthritis (RA) and Type 1 diabetes.

Subject: Pediatrics

Q. A child with diarrhea was eager to drink, and the skin pinch went back slowly. Which of the following categories is the child classified into as per IMNCI?

- A. Pink
- B. Yellow
- C. Green
- D. None

✅ *Correct Answer: 2*

🧠 Solution:
Correct Answer: B) Yellow Explanation: The clinical manifestations indicate some dehydration according to IMNCI (Integrated Management of Neonatal and Childhood Illness) classification. IMNCI uses a color-coded classification system where “eagerness to drink (indicating thirst)” and “slow skin pinch return” are characteristic findings in the "some dehydration" category. Assessment of Dehydration Parameters: Parameters No Dehydration (Green) (Option C)

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Some Dehydration (Yellow) (Option B) Severe Dehydration (Pink) (Option A) Sensorium Well alert Restless, irritable Lethargic, floppy Eyes Normal Sunken Very sunken Tears Present Absent Absent Mucosa Moist Dry Very dry Thirst Drinks normally Thirsty, drinks eagerly Drinks poorly/unable Skin pinch Goes back quickly Goes back slowly (<2 sec) Goes back very slowly (>2 sec) Pink (Option A): This category indicates severe dehydration with features like lethargy, very sunken eyes, and very slow skin pinch return (>2 seconds), none of which are present in this case. Severe dehydration requires immediate IV fluid therapy. Green (Option C): This indicates no dehydration, where children drink normally and skin pinch returns immediately. The child's eagerness to drink and slow skin pinch return are inconsistent with this category. None (Option D): This is incorrect as the child's symptoms clearly fit into the established IMNCI classification system.

Q. Anencephaly occurs due to the inability of the neural tube to close at which week of intrauterine life?

- A. 3rd week
- B. 4th week
- C. 5th week
- D. 2nd week

✅ *Correct Answer: 2*

🧠 Solution:
Correct Answer: B) 4th week Explanation: Anencephaly is a severe neural tube defect that occurs at the 4th week of gestation due to failure of closure of the rostral neuropore Results in absence of: Scalp Cranial bones Meninges Rudimentary brain tissue is exposed to the external environment which is incompatible with life. Anencephaly is a severe neural tube defect characterized by the partial or complete absence of the brain and cranial vault, resulting from the failure of neural tube closure during early fetal development. During labor, it may present with face presentation or shoulder dystocia. Prenatal ultrasound shows the absence of the cranial vault, exposed brain tissue, and the "frog eye sign," characterised by a flattened head with prominent, bulging orbits. {{caption_text}} {{caption_text}} 3rd week (Option A): At this stage, neurulation has just begun, and the neural tube formation is still in its early phases. The critical closure of the rostral neuropore has not yet started at this point in development. 5th week (Option C): By this time, neural tube closure should have already been completed. 2nd week (Option D): This is too early in development as neurulation has not yet begun. The embryo is still in the process of gastrulation during this period.

Q. Conjunctival xerosis is caused by which vitamin deficiency?

- A. Vitamin A
- B. Vitamin K
- C. Vitamin C
- D. Vitamin D

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✅ *Correct Answer: 1*

🧠 Solution:
Correct Answer: A) Vitamin A Explanation: Conjunctival xerosis (drying of conjunctiva) is the earliest sign of vitamin A deficiency. WHO Grading of eye signs of vitamin A deficiency (VAD) in children Grade Eye Sign XN Night blindness X1A Conjunctival xerosis X1B Bitot's spots X2 Corneal xerosis X3A Corneal ulcer covering less than 1/3 of the cornea X3B Corneal ulcer covering at least 1/3 of the cornea XS Corneal scarring Management of Vit A deficiency Standard Oral Treatment Children <6 months: 50,000 IU Children 6-12 months: 100,000 IU Children >1 year: 200,000 IU Administration Schedule Initial dose Repeat same dose next day Final dose 4 weeks later Parenteral Administration(For severe malabsorption or persistent vomiting) Children <6 months: 75% of oral dose Children ≥6 months: 50% of oral dose Ocular Emergencies Corneal clouding: Immediate parenteral administration of 50,000-100,000 IU (15-30 mg retinol) Keratomalacia: Antibiotic drops/ointment and eye padding Vitamin K (Option B): This vitamin is essential for blood clotting, and its deficiency results in bleeding manifestations such as easy bruising and mucocutaneous bleeding. It notably causes hemorrhagic disease in newborns, but it is not associated with ocular surface changes. Vitamin C (Option C): Deficiency leads to scurvy, characterized by gum bleeding, scorbutic rosary, and painful pseudo paralysis. Vitamin D (Option D): This vitamin primarily affects bone metabolism, and its deficiency leads to rickets in children. It does not have any direct effects on the conjunctiva or other ocular structures.

Subject: Pharmacology

Q. A patient was given an antipsychotic drug, haloperidol and the patient developed acute dystonia. Which is the next best step?

- A. Give Benztropine
- B. Change to clozapine
- C. Give Fluphenazine
- D. Increase dose of haloperidol

✅ *Correct Answer: 1*

🧠 Solution:
Correct Answer: A) Give Benztropine Explanation: Acute muscle dystonia is the first extrapyramidal symptom caused by antipsychotics. It is characterised by brief or prolonged muscle contractions causing abnormal movements or postures, such as oculogyric crises (upward eye rolling), tongue protrusion, trismus, torticollis (neck muscle twisting), laryngeal-pharyngeal dystonias, and dystonic postures of the limbs and trunk. Anticholinergic drugs like Benztropine, Diphenhydramine, Benzhexol and Promethazine can

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be used for treatment. Extrapyramidal Symptoms Condition Onset Treatment Acute muscle Dystonia Within 1-5 days of starting antipsychotic Administering antiparkinsonian agents such as diphenhydramine or benztropine intramuscularly. Parkinsonism Within 1 month Benzhexol and benztropine (NOT Levodopa) Akathisia (Most common EPS) 5–60 days Anti-anxiety medications DOC: Propranolol (C/I: Asthma) Diazepam Rabbit Syndrome Months or years Antiparkinsonian agents. Amantadine is preferred due to less adverse cognitive effects. Tardive Dyskinesia Late-onset adverse effects (after months or years) Occurs due to D2 receptor supersensitivity and can be permanent, even after discontinuing antipsychotic medication. Stop AP drugs & start Clozapine. If symptoms persist, add Dopamine depleters (VMAT2 inhibitors) Valbenazine Tetrabenazine: DOC for Huntington's disease. Change to clozapine (Option B): Clozapine is an atypical antipsychotic with a lower risk of extrapyramidal side effects (EPS), but switching to clozapine would not be the immediate treatment for acute dystonia. It should be considered for long-term management in patients who experience severe side effects with other antipsychotics, but it is not an emergency treatment for acute dystonia. Give Fluphenazine (Option C): Fluphenazine is another first-generation antipsychotic (similar to haloperidol). It may worsen extrapyramidal side effects, including acute dystonia. Therefore, it should not be given to a patient experiencing dystonia. Increase dose of haloperidol (Option D): Increasing the dose of haloperidol would worsen the dystonic symptoms and is not appropriate in the setting of acute dystonia.

Q. A group of people are travelling to the mountains, and a girl starts complaining of mountain sickness. What is the drug of choice?

- A. Promethazine
- B. Acetazolamide
- C. Dimenhydrinate
- D. Thiazide

✅ ***Correct Answer: 2***

🧠 Solution:
Correct Answer: B) Acetazolamide Explanation: The drug of choice for preventing and treating acute mountain sickness is acetazolamide. It is a carbonic anhydrase inhibitor that acts on PCT and leads to Na+/HCO3- excretion in urine. In Mountain sickness (acute mountain sickness or AMS), at high altitudes, lower oxygen levels lead to hyperventilation, which causes CO2 washout and respiratory alkalosis (alkaline blood suppresses CNS). Symptoms include headache, nausea, dizziness, fatigue, and shortness of breath. When Acetazolamide is taken, it produces metabolic acidosis and reduces hyperventilation. Promethazine (Option A) is an antihistamine commonly used for motion sickness, nausea, and vertigo. While it can relieve nausea and dizziness associated with mountain sickness, it does not address the underlying acclimatisation issues that cause AMS. Dimenhydrinate (Option C) is another antihistamine used for motion sickness and nausea. Like promethazine, it helps with symptoms but does not prevent or treat the root cause of mountain sickness. Thiazide (Option D) diuretics are primarily used for managing

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hypertension and edema. They are not used for mountain sickness and have no role in altitude adaptation.

Subject: Physiology

Q. Which of the following oxygen-sensitive channels is present in peripheral chemoreceptors?

- A. K+
- B. Na+
- C. Ca++
- D. Cl-

✅ ***Correct Answer: 1***

🧠 Solution:
Correct Answer: A) Potassium (K+) Explanation: The ion primarily involved in the function of O_2-sensitive channels in peripheral chemoreceptors is Potassium (K^+). These channels play a crucial role in oxygen sensing within the carotid bodies, which are the main chemoreceptor sites for detecting changes in blood oxygen levels. When oxygen levels drop, the O_2-sensitive potassium channels close, leading to cell depolarization and the subsequent release of neurotransmitters that signal the brain to increase respiration and blood pressure to maintain oxygen homeostasis Sodium (Na^+) (Option B): is not directly involved in the O2-sensitive channels. They play a different role in other cellular processes but are not the key ions for oxygen sensitivity in peripheral chemoreceptors. Calcium (Ca++) (Option C): is not directly involved in the O2-sensitive channels. Chloride (Cl^-) (Option D): does not play a direct role in the functioning of O2-sensitive channels in peripheral chemoreceptors.

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

- A. Chloride
- B. Sodium
- C. Potassium
- D. Calcium

✅ ***Correct Answer: 1***

🧠 Solution:
Correct Answer: A) Chloride Explanation: The CFTR (Cystic Fibrosis Transmembrane Conductance Regulator) gene codes for a chloride ion channel. Mutations in this gene lead to a defective CFTR protein, which disrupts chloride ion transport across cell membranes, contributing to the symptoms of cystic fibrosis. Pathophysiology: CFTR Function: Encodes an ATP-gated chloride (Cl−) channel Lungs and GI Tract: Secretes Cl− Sweat Glands: Reabsorbs Cl− Mutation Effects: ΔF508 Mutation: Leads to misfolding of the CFTR protein Protein Misfolding: Results in improper trafficking and retention of the protein in the rough endoplasmic reticulum (RER) Outcome: Protein is absent from the cell

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membrane Consequences of CFTR Dysfunction: Decreased Cl− Secretion: Reduced Cl− and H2O secretion into the lumen Compensatory Mechanisms: Increased Na+ reabsorption via epithelial sodium channels (ENaC) Increased H2O reabsorption Result: Abnormally thick mucus secreted in the lungs and GI tract Sweat Glands: Defective Cl− reabsorption Increased Na+ reabsorption leads to a more negative transepithelial potential difference

Subject: Psychiatry

Q. Atypical antipsychotic with the least metabolic side effects?

- A. Haloperidol
- B. Risperidone
- C. Ziprasidone
- D. Quetiapine

✅ *Correct Answer: 3*

🧠 Solution:
Correct Answer: C) Ziprasidone Explanation: Among the given options, Ziprasidone has the least metabolic side effects, with minimal impact outside the CNS, no significant weight gain, and no sustained prolactin elevation. Ziprasidone Class Atypical antipsychotic / 2nd generation antipsychotics Mechanism of action D2 and 5HT2A receptor antagonists Uses Schizophrenia Bipolar I disorder Acute treatment: Monotherapy of manic or mixed episodes Maintenance treatment: Adjunct to lithium or valproate. Adverse effects Most common side effects are somnolence, headache, dizziness, nausea, and lightheadedness. Prolongation of the QTc complex Less extrapyramidal side effects, hyperprolactinemia and more metabolic side effects. Haloperidol (Option A) is a first-generation antipsychotic (typical antipsychotic) effective for managing psychosis but is known for a higher risk of extrapyramidal symptoms (EPS) such as dystonia, akathisia, and tardive dyskinesia. Risperidone (Option B) is an atypical antipsychotic known for causing more extrapyramidal symptoms and hyperprolactinemia, as well as an increased stroke risk. It is used to treat schizophrenia, autism, acute mania, and bipolar disorder. It has more metabolic side effects than ziprasidone. Quetiapine (Option D) is an atypical antipsychotic approved for schizophrenia, unipolar depression, acute mania, and bipolar disorder. Its adverse effects include somnolence, headache, dizziness, constipation, weight gain, and elevated plasma triglycerides and cholesterol.

Q. What is the diagnosis for a patient who believes their bodily sensations or movements are controlled or influenced by an external agency?

- A. Delusion of nihilism
- B. Delusion of reference
- C. Othello syndrome
- D. Somatic passivity

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✅ *Correct Answer: 4*

🧠 Solution:
Correct Answer: D) Somatic passivity Explanation: Somatic Passivity (also known as Thought Alienation or Passivity Phenomenon) is the diagnosis of a patient who believes their bodily sensations or movements are controlled or influenced by an external agency. It is one of the hallmark symptoms of Schizophrenia. Schizophrenia’s First Rank Symptoms: Category Symptom Description Thought Alienation Phenomenon Thought Insertion A belief that others are placing thoughts into the patient’s mind. Thought Withdrawal A belief that thoughts are being removed from the patient’s mind. Thought Broadcasting A belief that others can know or access the patient’s thoughts. Made Phenomenon Made Volition A belief that actions are controlled by an external force. Made Affect A belief that external forces are altering the patient's emotions. Made Impulses Sudden urges or impulses that are perceived as implanted by others. Auditory Hallucinations Voices Arguing/Discussing The patient hears voices discussing or arguing about them, often in the third person. Example: The patient hears two voices arguing, one saying, “He’s a failure,” and the other replying, “No, he’s not.” Voices Commenting The patient hears a voice providing commentary on their actions, usually in the third person. Example: While cooking, a patient hears a voice say, “She’s burning the food,” reflecting their actions. Audible Thoughts The patient hears their own thoughts spoken aloud by a voice. Example: A patient thinks, “I need to go to the store,” and immediately hears a voice say the same phrase. Somatic Passivity Physical sensations are perceived as imposed by external agents. Example: A patient feels a burning sensation in their arm and believes it is caused by invisible rays from a satellite. Delusional Perception A normal perception is interpreted with a delusional belief Example: A patient sees a red car parked outside and believes it indicates the police are monitoring them for criminal activity. Delusion of nihilism (Option A) refers to the delusion where an individual denies the existence of their body, mind, loved ones, or the world, claiming they have no intelligence, that parts of their body are absent, or even believing they are dead or that the world has ended. It is seen in disorders such as schizophrenia and depression. Delusion of reference (Option B) is a condition in which the patient believes that someone is talking about him or spying on him. Othello syndrome (Option C) or Delusion of infidelity/ jealousy refers to a condition in which the patient believes that the partner or spouse is having an affair even though that is not true. Prolonged alcohol use is linked to this condition.

Subject: Radiology

Q. Which among the following is most radiosensitive?

- A. Testis
- B. Bone

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- C. Nerve
- D. Muscle

✅ *Correct Answer: 1*

🧠 Solution:
Correct Answer: A) Testis Explanation: Radiosensitivity refers to the susceptibility of tissues or cells to damage from ionizing radiation. It is influenced by the Law of Bergonié and Tribondeau, which states that rapidly dividing, undifferentiated cells are more sensitive to radiation. Testis: Highly radiosensitive due to the presence of rapidly dividing spermatogonia in the germinal epithelium. Even low doses of radiation can impair spermatogenesis, making it the most radiosensitive tissue among the options. According to the Law of Bergonie: The more the cells are rapidly dividing, the more they are sensitive to radiation. M-phase (dividing phase) is the most radiosensitive phase S-phase (Synthesizing phase) is the most radioresistant phase Most radiosensitive tissue in the body is Bone marrow (rapidly dividing). Most radioresistant tissue in the body is neurons (non-dividing). Most radiosensitive cells in the blood are lymphocytes. The most radioresistant cell in the blood is the platelet. The most radioresistant organ in the body is the vagina. Bone (Option B): Bones, especially mature ones, are relatively radioresistant due to low mitotic activity. Nerve (Option C): Nerve cells are highly differentiated and do not undergo cell division, making them radioresistant. Muscle (Option D): Muscle cells are also highly differentiated and have low mitotic activity, making them radioresistant like nerve tissue.

Q. Radioisotope used in PET-CT scan?

- A. 18F-FDG
- B. Iodine
- C. Radium
- D. Cesium-131

✅ *Correct Answer: 1*

🧠 Solution:
Correct Answer: A) 18F-FDG Explanation: 18F-FDG (Fluorodeoxyglucose) is the most commonly used radiotracer in PET-CT scans. It is a glucose analog labeled with the radioactive isotope Fluorine-18. It accumulates in tissues with high glucose metabolism, such as cancer cells, inflammation, or infection, making it highly useful for diagnosing and staging cancers, monitoring treatment response, and detecting recurrent disease. Fluorodeoxyglucose (FDG) positron-emission tomography (PET-FDG) Uptake of 18F-FDG (Analogue of endogenous glucose) in large quantities by cancer cells as compared to normal cells Application: Quantification of tumor metabolic activity Diagnosis (lung cancer) and Staging of cancer Assessing distant metastasis More sensitive in primary lung and oesophageal cancer metastatic disease Assessment of response to treatment A decrease in FDG uptake after chemotherapy indicates that the tumor is responding to treatment Routine

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surveillance following treatment- not commonly preferred. {{caption_text}} Not useful in the following situations: High Glycolytic Metabolism tissues: Central nervous system tumors. Inflammation vs. Cancer: Both conditions exhibit increased glucose metabolism. Movement disorders Coronary blood flow Warburg Effect Cancer cells prefer glycolysis over oxidative phosphorylation, even in the presence of oxygen. This leads to increased glucose uptake and lactate production, common in many cancers. 18F-fluorodeoxyglucose (18F-FDG), a glucose analog used in PET imaging, helps study this effect. Mechanisms of 18F-FDG Accumulation Mechanism Description Aerobic Glycolysis Cancer cells rely heavily on glycolysis, increasing glucose and 18F-FDG uptake, even with oxygen. Transport & Trapping GLUT-1 transporters mediate glucose entry. 18F-FDG is phosphorylated and trapped inside cells. Tumor Heterogeneity Differences in tumor subtype, size, and microvasculature affect 18F-FDG uptake. Clinical Implications of 18F-FDG Implication Details Prognostic Indicator Higher 18F-FDG uptake correlates with worse prognosis (e.g., shorter DFS in invasive ductal carcinoma). Reverse Warburg Effect Cancer-associated fibroblasts (CAFs) increase glycolysis in tumor cells via metabolic coupling. Treatment Monitoring PET imaging tracks changes in 18F-FDG uptake, reflecting therapy responses targeting glycolysis or mitochondria. Iodine (Option B): Radioactive iodine (e.g., I-131 or I-123) is mainly used in thyroid imaging and treatment of thyroid disorders Radium (Option C): Radium-223 is used in the treatment of bone metastases (e.g., in prostate cancer) Cesium-131 (Option D): Cesium-131 is used in brachytherapy for localized radiation delivery (e.g., in prostate cancer)

Q. Ideal thickness of lead aprons to be worn by workers working in radiology department?

- A. 0.5mm
- B. 1mm
- C. 0.75mm
- D. 2mm

✅ ***Correct Answer: 1***

🧠 Solution:
Correct Answer: A) 0.5mm Explanation: Lead aprons are used to protect from the radiation received during an invetigation The lead apron protects us from the scattered radiation that comes from the patient The minimum thickness of the lead apron recommended is 0.25 mm according to the Indian guidelines. 0.5 mm according to international guidelines In India, most commonly 0.5 mm thickness is preferred. Key Points on Lead Aprons and Radiation Protection Purpose of Lead Aprons: Used to protect healthcare workers and others from scattered radiation during medical investigations. Scatter radiation primarily arises from the patient and is caused by the Compton effect. Materials Used: Traditional lead aprons are heavy. Lightweight, lead-free aprons are now made using antimony and bismuth. Material Properties: Radiation shielding materials must have a high atomic weight to block high-energy radiation effectively. Thickness Guidelines: Indian Guidelines: Minimum lead thickness is 0.25 mm, with 0.5 mm preferred for better protection. International Guidelines: Recommend 0.5 mm lead thickness. Additional Protective Equipment: Lead gloves: Protect

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hands during procedures like fluoroscopy. Thyroid shields: Protect the thyroid gland, especially during radiation exposure. Radiation-Induced Thyroid Cancer: Papillary carcinoma is the most common thyroid cancer associated with radiation exposure.

Subject: Surgery

Q. A 40-year-old man presents with gynecomastia. Ultrasound reveals a 1 cm solid mass within the body of the testis. Serum testosterone is 600 ng/dL, and estradiol is 35 pg/mL. What is the most likely diagnosis?

- A. Spermatocytic tumor
- B. Sertoli cell tumor
- C. Granulosa cell tumor
- D. Leydig cell tumor

✅ ***Correct Answer: 4***

🧠 Solution:
Correct Answer: D) Leydig cell tumor Explanation: Leydig cell tumors are the most likely diagnosis in this case. These tumors often present with gynecomastia due to the production of estrogens, as they secrete both testosterone and estrogen. The patient's elevated serum sex hormones suggests Leydig cell tumors. Sex cord-stromal tumours have two major subtypes: Leydig cell and Sertoli cell tumour. Leydig cell tumour Sertoli cell tumour Hormonal involvement It often involves androgens, oestrogens, and corticosteroids. Hormonally silent. Conditions associated with Klinefelter syndrome. Cryptorchidism. Renal cell carcinoma. Carney complex. Peutz-Jeghers syndrome. Familial adenomatous polyposis. Malignancy 10% (in adults) 10% Gross Circumscribed nodules, usually < 5 cm in diameter. They have a distinctive golden brown, homogeneous appearance on cut surfaces. Firm, small nodules with a homogeneous grey-white to yellow cut surface. Histology The tumour cells resemble their normal counterparts. They are large in size and have round or polygonal cell outlines, abundant granular eosinophilic cytoplasm, and a round central nucleus. The cytoplasm frequently contains lipid droplets, vacuoles, or lipofuscin pigment and, most characteristically, rod-shaped Reinke crystalloids (25% of the tumours). The tumour cells are arranged in distinctive trabeculae that tend to form cord-like structures and tubules. Image {{caption_text}} {{caption_text}} Incorrect Options: Spermatocytic tumors (Option A) are typically benign and present with a painless testicular mass. They are usually diagnosed in older men (over 50 years of age) and are characterised by a slow-growing mass & do not secrete any hormones. Sertoli cell tumours (Option B) mostly present as painless testicular masses. They are hormonally silent but sometimes produce estrogen & are less commonly associated with elevated estradiol levels compared to Leydig cell tumors. The presence of gynaecomastia along with increased testosterone makes Leydig cell tumour more likely. Granulosa cell tumours (Option C) are more commonly seen in females and are extremely rare in males. They usually present as slow-growing and non-functioning testicular mass.

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Q. Which of the following is not an indication for splenectomy?

- A. Iatrogenic splenic trauma
- B. Thrombocytopenia
- C. Hairy cell leukemia
- D. Bone marrow failure

✅ *Correct Answer: 4*

🧠 Solution:
Correct Answer: D) Bone marrow failure Explanation: Bone marrow failure (Option D) is not typically an indication for splenectomy. Bone marrow failure syndromes like aplastic anemia, myelodysplastic syndromes, or other causes of bone marrow suppression usually require treatment to support bone marrow function (e.g., transfusions, medications, or stem cell transplantation), rather than removal of the spleen Indications for Splenecomy: Hodgkin Lymphoma & Non-Hodgkin Lymphoma Hairy Cell Leukemia (Option C) CLL & CML Splenic Marginal Zone Lymphoma Metastatic Splenic Tumors Splenic Cysts (True and Pseudocysts) Splenic Abscess Angiosarcoma (Hemangiosarcoma) Lymphangioma and Lymphangiosarcoma Traumatic Splenic Rupture (Option A) Hypersplenism (due to various hematologic conditions) Non-Hematologic Primary Tumors (e.g., splenic hemangiomas) Immune Thrombocytopenia (ITP) (Option B) Hereditary Spherocytosis & Elliptocytosis Pyruvate Kinase Deficiency (PKD) Glucose-6-phosphate dehydrogenase Deficiency (G6PD) Sickle Cell Disease Thalassemia Acute Splenic Sequestration Crisis (in sickle cell disease or sickle-beta thalassemia)

Q. A patient underwent surgery for pilonidal sinus, which type of flap is used in this surgery?

- A. Rhomboid flap
- B. Advanced flap
- C. Rotational flap
- D. Free flap

✅ *Correct Answer: 1*

🧠 Solution:
Correct Answer: A) Rhomboid flap Explanation: The Rhomboid flap is often used in pilonidal sinus surgery, especially when excision of the sinus results in a defect that requires tissue advancement to close. This flap allows for tension-free closure and ensures the area is adequately covered, helping to prevent recurrence of the sinus. Pilonidal sinuses are found in the natal cleft (the groove at the top of the buttocks), consisting of one or more skin openings connected to a subcutaneous track lined with granulation tissue, often containing hair. Acquired Condition: Pilonidal sinuses are now considered acquired rather than congenital. Causes: Friction and shearing forces between the skin folds can cause loose hairs to penetrate the skin. Movement of the skin folds may create suction, pulling hair into the skin and forming a chronically infected track, which can develop secondary tracks with

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discharging openings. Clinical Presentation: Demographics: More common in men, typically presenting after puberty and before age 40, prevalent in individuals with dark, coarse hair. Symptoms: Intermittent pain, swelling, and discharge at the base of the spine. History of recurring abscesses, which may burst spontaneously or require incision. Treatment Options: Treatment Type Description Conservative Treatment For mild cases: cleaning, hair removal, and hygiene maintenance. Cauterization with silver nitrate or laser in less complex cases. Acute Abscess Treatment Drainage through a small longitudinal incision over the abscess. Thorough cleaning of the abscess cavity to remove granulation tissue and hair. Surgical Treatment Procedures include: Laying open sinus tracks (with/without marsupialisation) Complete excision (with/without primary closure) Off-midline closure techniques (Limberg, Z-plasty, Karydakis procedures). Bascom Procedure: Lateral incision to clean the sinus cavity, excise midline pits, and leave lateral wounds open to heal secondarily. Flap Procedures: Used if initial treatments fail or if the sinus recurs. Pilonidal sinus excision and repair by rhomboid flap: {{caption_text}} Off-midline closures are associated with lower recurrence rates and faster healing than midline closures.

Q. Which of the following structures does not form the boundary of Hesselbac's triangle?

- A. Inferior epigastric artery
- B. Vas deferens
- C. Rectus abdominis
- D. Inguinal ligament

✅ ***Correct Answer: 2***

🧠 Solution:
Correct Answer: B) Vas deferens Explanation: The vas deferens do not form a boundary of Hesselbach's triangle. It passes through the inguinal canal and is located posterior to the inguinal ligament, but it is not part of the triangle's boundaries. Hesselbach’s Triangle: A weak spot in the abdominal wall, where direct inguinal hernias occur. Covered only by the transversalis fascia and external oblique aponeurosis. Susceptible to herniation, especially in elderly patients or those with increased abdominal pressure. Boundaries: Lateral border: Inferior epigastric vessels (Option A) Medial border: Rectus abdominis muscle (Option C) Inferior border: Inguinal ligament (Poupart’s ligament) (Option D)

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

- A. Femoral nerve
- B. Genitofemoral nerve
- C. Obturator nerve
- D. Ilioinguinal nerve

✅ ***Correct Answer: 4***

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🧠 Solution:
Correct Answer: D) Ilioinguinal nerve Explanation: The most commonly injured nerve during open inguinal hernia surgery is the ilioinguinal nerve, often leading to chronic pain as a complication. The most common nerve injured in: Open repair: Ilio-inguinal > Iliohypogastric > Genital branch of Genitofemoral nerve. Laparoscopy: Lateral Cutaneous nerve of thigh > Genito-femoral nerve. Landmarks in Laparoscopic Surgery: Triangle of Doom: Injury to Iliac vessels Triangle of Pain: Injury to Nerves causing postoperative pain Complications of Surgery: Immediate Complications: Bleeding/Hematoma: From subcutaneous or inferior epigastric vessels. Urinary Retention: May require catheterization. Femoral Nerve Blockade Early Postoperative Issues (within the first week): Pain, Bruising, Swelling: Common. Seroma Formation: Often resolves spontaneously; may need aspiration. Wound Infection: Less frequent; routine antibiotics not recommended. Testicular Infarction: Damage to the testicular artery during dissection or repair. Long-term Concerns: Chronic Pain: Nerve Injury: Damage to nerves such as the ilioinguinal or iliohypogastric nerves during surgery. Nerve Irritation: Chronic irritation by suture material or mesh. Psychological Factors Hernia Recurrence: Inadequate repair or weakness in the abdominal wall; mesh-related issues may also contribute.

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