MDCAT (DUHS entry test, Code B — Green) — 2022 · Solved Past Paper

Body: Dow University of Health Sciences (DUHS) · **Post:** MDCAT (DUHS entry test, Code B — Green) · **Year:** 2022 · **Questions:** 200 in the original paper — **198 solved and verified**, 2 excluded as defective (Q56, Q86) · **Price:** Free

> **How to use this paper:** each question shows the stem, the four options, and the correct answer. Click “Why each option?” under a question to see all four options explained — one question teaches four topics. General Knowledge answers are as of the 2022 sitting.

Source note: educationinkarachi.net reproduction of the DUHS MDCAT 2022 paper (Code B, Green), with every answer taken from the OFFICIAL DUHS MDCAT-2022 answer key (Code-B column); the official key confirms 192/200 answers, six official-key errors were corrected with cited evidence (Q4, Q9, Q35, Q71, Q74, Q157) and two questions have no correct option at all (DEFECTIVE-excluded Q56, Q86). Exam held Sunday 13 November 2022. Code B (Green) is the same sitting as Codes A (Yellow), C (White), D (Blue) and E (Pink) — the same 200 questions in a different order. Five options A–E throughout. Subject split: Biology Q1–68, Chemistry Q69–122, Physics Q123–176, English Q177–191, Logical Reasoning Q192–200. Time allowed 3 hours 30 minutes. Answers verified independently against reference facts, worked derivations and targeted sources, never from the printed key alone. Decisions by the assistant under the owner's 8 Nov 2026 delegation.

Question 1 Hepatitis cause

Hepatitis is caused by:

- A. Protozoans
- B. Algae

- D. Fungi
- E. Virus ✓ **Correct answer**

A. wrong: hepatitis is caused by a virus, not by protozoans.

B. wrong: hepatitis is caused by a virus, not by algae.

C. wrong: hepatitis is caused by a virus, not by bacteria.

D. wrong: hepatitis is caused by a virus, not by fungi.

E. correct: hepatitis is caused by hepatitis viruses (A, B, C, D and E).

Question 2 Syphilis cause

Syphilis is caused by a bacteria called as:

- A. Bacilli
- B. Trichomonas
- C. Neisseria gonorrhea
- D. Genital herpes
- E. Treponema palladium ✓ **Correct answer**

A. wrong: syphilis is caused by Treponema pallidum (printed 'palladium' in the paper), not by bacilli in general.

B. wrong: Trichomonas causes trichomoniasis, not syphilis.

C. wrong: Neisseria gonorrhoeae causes gonorrhoea, not syphilis.

D. wrong: genital herpes is caused by herpes simplex virus, not by the syphilis bacterium.

E. correct: syphilis is caused by the bacterium Treponema pallidum (printed 'palladium' in the paper).

3 Vestigial pelvic girdle evidence

Presence of remnant of pelvic girdle in whale and snake although they never have legs, shows evidence from:

- A. Biochemical evidence
- B. Paleontology
- C. Vestigial organs ✓ **Correct answer**
- D. Embryology
- E. Taxonomy

A. wrong: the remnant pelvic girdle is a vestigial structure, not biochemical evidence.

B. wrong: paleontology is the study of fossils, not the evidence from vestigial organs.

C. correct: the remnant pelvic girdle in whales and snakes, which never have legs, is evidence from vestigial organs.

D. wrong: embryology is the study of embryos, not the evidence from vestigial organs.

E. wrong: taxonomy is classification, not the evidence from vestigial organs.

Question 4 Photosynthetic bacteria liberate — official key error corrected

Photosynthetic bacteria liberate:

- A. CO_2
- B. H_2S
- C. Sulphur ✓ **Correct answer**
- D. Hydrogen
- E. O_2

A. wrong: photosynthetic bacteria consume CO_2, they do not liberate it.

B. wrong: H_2S is the electron donor the bacteria use, not what they liberate — the official

ists B, which is wrong.

C. correct: photosynthetic (purple sulphur) bacteria use H_2S as electron donor and liberate elemental sulphur ($CO_2 + H_2S \rightarrow$ sugars + water + sulphur).

D. wrong: photosynthetic bacteria do not liberate hydrogen.

E. wrong: anoxygenic photosynthetic bacteria do not liberate oxygen. (Official-key error: official Code-B key B corrected to C; decided by assistant under owner's 8 Nov 2026 delegation.)

Question 5 Plasma membrane nature

Plasma membrane is:

- A. Permeable
- B. Selective permeable ✓ **Correct answer**
- C. impermeable
- D. Sub permeable
- E. Non permeable

A. wrong: the plasma membrane is not freely permeable to everything.

B. correct: the plasma membrane is selectively permeable — it allows some substances through and blocks others.

C. wrong: the plasma membrane allows substances to pass, so it is not impermeable.

D. wrong: there is no 'sub permeable' property of the plasma membrane.

E. wrong: the plasma membrane is selectively permeable, not non-permeable.

Question 6 Water content of living organisms

Water is the most abundant compound in living organism its amount varies from:

- A. 30% to 60%

- C. 10% to 20%
- D. 70% to 90% ✓ **Correct answer**
- E. 40% to 50%

A. wrong: the water content of living organisms varies from about 70% to 90%.

B. wrong: the water content of living organisms varies from about 70% to 90%.

C. wrong: the water content of living organisms varies from about 70% to 90%.

D. correct: water is the most abundant compound in living organisms, making up about 70% to 90% of their mass.

E. wrong: the water content of living organisms varies from about 70% to 90%.

Question 7 Second heart sound phase

The phase in which bicuspid and tricuspid valves open & semilunar valve close which produces a 2nd heart sound (dub or dup). This the phase is known as:

- A. Atrial diastole
- B. Ventricular diastole ✓ **Correct answer**
- C. Ventricular systole
- D. Contraction of heart
- E. Systole

A. wrong: the second heart sound (dub) is produced when the semilunar valves close at the start of ventricular diastole.

B. correct: the bicuspid and tricuspid valves open and the semilunar valves close at the start of ventricular diastole, producing the second heart sound (dub).

C. wrong: during ventricular systole the semilunar valves are open, not closed.

D. wrong: the second heart sound marks the start of ventricular diastole, not contraction.

e second heart sound is produced at the start of diastole, not systole.

Question 8 Independent assortment phenotypic ratio

Phenotypic ratio of law of independent assortment of genes:

- A. 9 : 7
- B. 13 : 3
- C. 9 : 3 : 3 : 1 ✓ **Correct answer**
- D. 15 : 1
- E. 12 : 3 : 1

A. wrong: 9:7 is a modified dihybrid ratio, not the independent assortment ratio.

B. wrong: 13:3 is a modified dihybrid ratio, not the independent assortment ratio.

C. correct: the phenotypic ratio of a dihybrid cross under the law of independent assortment is 9:3:3:1.

D. wrong: 15:1 is a modified dihybrid ratio, not the independent assortment ratio.

E. wrong: 12:3:1 is a modified dihybrid ratio, not the independent assortment ratio.

Question 9 Triose and glycerol synthesis — official key error corrected

Triose and glycerol is used in the synthesis of:

- A. Carbohydrate
- B. Protein
- C. Lipid ✓ **Correct answer**
- D. Fatty acid
- E. Phospholipid

A. wrong: triose and glycerol are used in the synthesis of lipids, not carbohydrates.

ose and glycerol are used in the synthesis of lipids, not proteins.

C. correct: triose (as dihydroxyacetone phosphate) gives glycerol, the backbone to which fatty acids are esterified to form lipids (triglycerides).

D. wrong: fatty acids are synthesised from acetyl-CoA, not from triose and glycerol — the official Code-B key lists D, which is wrong.

E. wrong: phospholipids are a type of lipid, but the general product of triose and glycerol is lipid. (Official-key error: official Code-B key D corrected to C; decided by assistant under owner's 8 Nov 2026 delegation.)

Question 10 Inhibitors of nervous-system enzymes

They are inhibitors of key enzymes in the nervous system:

- A. Calcium and Potassium
- B. Substrate and activators
- C. Hexokinase and glucose
- D. Magnesium and manganese
- E. Pesticides DDT and parathione ✓ **Correct answer**

A. wrong: calcium and potassium are not inhibitors of key nervous-system enzymes.

B. wrong: substrates and activators are not inhibitors of nervous-system enzymes.

C. wrong: hexokinase and glucose are not inhibitors of nervous-system enzymes.

D. wrong: magnesium and manganese are not inhibitors of nervous-system enzymes.

E. correct: the pesticides DDT and parathion (printed 'parathione' in the paper) inhibit key enzymes of the nervous system (acetylcholinesterase).

Question 11 Apical dominance hormone

Plant hormone associated with apical dominance is:

in ✓ **Correct answer**

- B. Gibberellin
- C. Cytokinin
- D. Ethene
- E. Abscisic acid

A. correct: auxin, produced at the shoot tip, suppresses lateral bud growth — this is apical dominance.

B. wrong: gibberellins promote stem elongation, they do not cause apical dominance.

C. wrong: cytokinins promote lateral bud growth, opposing apical dominance.

D. wrong: ethene (ethylene) promotes fruit ripening, it does not cause apical dominance.

E. wrong: abscisic acid promotes dormancy and stomatal closure, it does not cause apical dominance.

Question 12 Bolus enters esophagus not trachea

Bolus enters the esophagus not the trachea due to presence of:

- A. Roof palate
- B. Mouth
- C. Epiglottis ✓ **Correct answer**
- D. Buccal cavity
- E. Tongue

A. wrong: the roof of the mouth does not prevent food entering the trachea.

B. wrong: the mouth does not prevent food entering the trachea.

C. correct: the epiglottis covers the glottis during swallowing, so the bolus enters the esophagus and not the trachea.

D. wrong: the buccal cavity does not prevent food entering the trachea.

e tongue pushes the bolus back, but it is the epiglottis that closes the trachea.

Question 13 Net ATP at end of glycolysis

Net ATP produced at the end of glycolysis:

- A. 2 ATP ✓ **Correct answer**
- B. 4 ATP
- C. 6 ATP
- D. 3 ATP
- E. 8 ATP

A. correct: glycolysis produces 4 ATP but uses 2, so the net gain is 2 ATP.

B. wrong: 4 ATP are formed in glycolysis, but 2 are consumed, so the net gain is 2 ATP.

C. wrong: the net ATP gain of glycolysis is 2 ATP, not 6.

D. wrong: the net ATP gain of glycolysis is 2 ATP, not 3.

E. wrong: the net ATP gain of glycolysis is 2 ATP, not 8.

Question 14 Turbellaria, Trematoda, Cestoda phylum

Class turbellaria, Trematoda, Cestoda belongs to phylum:

- A. Echinodermata
- B. Porifera
- C. Aschelminthes
- D. Cnidaria
- E. Platyhelminthes ✓ **Correct answer**

A. wrong: Turbellaria, Trematoda and Cestoda are flatworms, not echinoderms.

B. wrong: Turbellaria, Trematoda and Cestoda are flatworms, not sponges.

C. wrong: Turbellaria, Trematoda and Cestoda are flatworms, not roundworms.

rbellaria, Trematoda and Cestoda are flatworms, not cnidarians.

E. correct: Turbellaria, Trematoda and Cestoda are classes of the phylum Platyhelminthes (flatworms).

Question 15 Spikelet inflorescence family

Spikelet inflorescence is the characteristic of family:

- A. Solanaceae
- B. Rosaceae
- C. Fabceae
- D. Poaceae ✓ **Correct answer**
- E. Mimosaceae

A. wrong: Solanaceae (potato family) does not have spikelet inflorescence.

B. wrong: Rosaceae (rose family) does not have spikelet inflorescence.

C. wrong: Fabaceae (legume family) does not have spikelet inflorescence.

D. correct: spikelet inflorescence is characteristic of the family Poaceae (grasses).

E. wrong: Mimosaceae does not have spikelet inflorescence.

Question 16 Each myosin surrounded by

Each myosin is surrounded by:

- A. Motor nerves
- B. Myosin head
- C. 6-actin filaments ✓ **Correct answer**
- D. 2-actin filaments
- E. 4-actin filaments

A. wrong: myosin is surrounded by actin filaments, not motor nerves.

ch myosin is surrounded by actin filaments, not by myosin heads.

C. correct: in a muscle sarcomere each thick (myosin) filament is surrounded by six thin (actin) filaments.

D. wrong: each myosin filament is surrounded by six actin filaments, not two.

E. wrong: each myosin filament is surrounded by six actin filaments, not four.

Question 17 Disaccharide from two glucose

Synthesis of disaccharide by condensation two glucose joined by glycosidic linkage to form:

- A. Galactose
- B. Lactose
- C. Fructose
- D. Phosphate
- E. Maltose ✓ **Correct answer**

A. wrong: galactose is a monosaccharide, not a disaccharide of two glucose molecules.

B. wrong: lactose is glucose + galactose, not two glucose molecules.

C. wrong: fructose is a monosaccharide, not a disaccharide of two glucose molecules.

D. wrong: phosphate is not a disaccharide.

E. correct: two glucose molecules joined by a glycosidic linkage form maltose.

Question 18 White-eyed trait in Drosophila

White eyed trait in drosophila is due to:

- A. Linkage
- B. Mutation ✓ **Correct answer**
- C. Crossing over

- E. Gene pool

A. wrong: the white-eye trait is due to mutation, not linkage.

B. correct: the white-eyed trait in Drosophila is due to a mutation in the gene for eye colour.

C. wrong: the white-eye trait is due to mutation, not crossing over.

D. wrong: the white-eye trait is due to mutation, not the genome as a whole.

E. wrong: the white-eye trait is due to mutation, not the gene pool.

Question 19 Enzymes inactivated by UV and rays

Enzymes are generally inactivated rapidly by exposure to UV, high-energy alpha, beta rays because it alters the:

- A. Quantity of enzyme
- B. pH of enzyme
- C. Shape of enzymes ✓ **Correct answer**
- D. Temperature of enzyme
- E. Nature of enzyme

A. wrong: radiation alters the shape of enzymes, not their quantity.

B. wrong: radiation alters the shape of enzymes, not their pH.

C. correct: UV and high-energy alpha and beta rays alter the shape of enzymes, inactivating them.

D. wrong: radiation alters the shape of enzymes, not their temperature.

E. wrong: radiation alters the shape of enzymes — that is the specific change. (Note: the stem is garbled in the paper print ('UV high and also a, ß rays'); it is transcribed as 'UV,

alpha, beta rays.)

Question 20 Frog breathing, old air retained in

In frog New air drawn into bucco-pharyngeal cavity through nostrils and old air retained under pressure in:

- A. Lungs ✓ **Correct answer**
- B. Nasal
- C. Glottis
- D. Trachea
- E. Nostrils

A. correct: in the frog, new air is drawn into the bucco-pharyngeal cavity through the nostrils and old air is retained under pressure in the lungs.

B. wrong: old air is retained in the lungs, not in the nasal passages.

C. wrong: old air is retained in the lungs, not in the glottis.

D. wrong: old air is retained in the lungs, not in the trachea.

E. wrong: old air is retained in the lungs, not in the nostrils.

Question 21 Genetic information in DNA stored as

Genetic information in DNA is stored in the form of:

- A. Genetic code ✓ **Correct answer**
- B. Chromosome
- C. Amino acid
- D. Helix
- E. Hydrogen bond

A. correct: genetic information in DNA is stored in the form of the genetic code (the sequence of bases).

romosomes carry DNA, but the information itself is stored as the genetic code.

C. wrong: amino acids are the products of gene expression, not the storage form of genetic information.

D. wrong: the helix is the shape of DNA, not the storage form of genetic information.

E. wrong: hydrogen bonds hold the DNA strands together, they do not store genetic information.

Question 22 Pyruvic acid is acid of

Pyruvic acid is acid of:

- A. 4 carbon compound
- B. 5 carbon compound
- C. 6 carbon compound
- D. 7 carbon compound
- E. 3 carbon compound ✓ **Correct answer**

A. wrong: pyruvic acid is a 3-carbon compound.

B. wrong: pyruvic acid is a 3-carbon compound.

C. wrong: pyruvic acid is a 3-carbon compound.

D. wrong: pyruvic acid is a 3-carbon compound.

E. correct: pyruvic acid ($CH_3COCOOH$) is a 3-carbon compound.

Question 23 Plant cell wall made of

Plant cell wall is made up of:

- A. Lignin
- B. Hemicellulose

- D. Chitin
- E. Cellulose ✓ **Correct answer**

A. wrong: lignin strengthens secondary walls, but the plant cell wall is principally made of cellulose.

B. wrong: hemicellulose is a component of the wall, but the wall is principally made of cellulose.

C. wrong: the plant cell wall is made of cellulose (the paper prints 'Cuin', a misprint of 'Cutin', which is a waxy coating, not the wall).

D. wrong: chitin is found in fungal walls and arthropod exoskeletons, not plant cell walls.

E. correct: the plant cell wall is made up of cellulose.

Question 24 Plant-like character in Euglena

Plant like character found in Euglena:

- A. Pyrenoid ✓ **Correct answer**
- B. Cilia
- C. Photoreceptor
- D. Flagellum
- E. Pellicle

A. correct: Euglena has a pyrenoid (a protein body associated with chloroplasts) — a plant-like character.

B. wrong: cilia are not the plant-like character of Euglena.

C. wrong: the photoreceptor (eyespot) is an animal-like character of Euglena.

D. wrong: the flagellum is an animal-like character of Euglena.

e pellicle is not the plant-like character of Euglena.

Question 25 Neurosecretory cells, releasing and inhibiting hormones

It has neurosecretory cells that secrete releasing & inhibiting hormone:

- A. Pituitary gland
- B. Thyroid gland
- C. Adrenal gland
- D. Master gland
- E. Hypothalamus ✓ **Correct answer**

A. wrong: the pituitary releases hormones, but the neurosecretory cells that secrete releasing and inhibiting hormones are in the hypothalamus.

B. wrong: the thyroid does not secrete releasing and inhibiting hormones.

C. wrong: the adrenal gland does not secrete releasing and inhibiting hormones.

D. wrong: the 'master gland' is the pituitary, not the site of releasing and inhibiting hormones.

E. correct: the hypothalamus has neurosecretory cells that secrete releasing and inhibiting hormones, which control the pituitary.

Question 26 Seat of conscious activity

It is the seat of all conscious activity:

- A. Hind brain
- B. Cortex ✓ **Correct answer**
- C. Spinal cord
- D. Mid brain
- E. Medulla oblongata

e hind brain controls involuntary actions, not conscious activity.

B. correct: the cerebral cortex is the seat of all conscious activity.

C. wrong: the spinal cord carries signals and controls reflexes, it is not the seat of conscious activity.

D. wrong: the mid brain relays signals, it is not the seat of conscious activity.

E. wrong: the medulla controls involuntary actions, not conscious activity.

Question 27 Common energy currency of the cell

The common energy currency of the cell is:

- A. NHDP
- B. ADP
- C. ATP ✓ **Correct answer**
- D. NADH
- E. PEPS

A. wrong: there is no 'NHDP' energy currency.

B. wrong: ADP is the low-energy form, not the common energy currency.

C. correct: ATP is the common energy currency of the cell.

D. wrong: NADH is an electron carrier, not the common energy currency.

E. wrong: there is no 'PEPS' energy currency.

Question 28 Scorpioid cyme found in

Scorpoid cyme is found in:

- A. Cotton ✓ **Correct answer**
- B. Mulberry

flower

- D. Sundew
- E. Banana

A. correct: scorpioid cyme is found in cotton.

B. wrong: scorpioid cyme is found in cotton, not mulberry.

C. wrong: scorpioid cyme is found in cotton, not sunflower.

D. wrong: scorpioid cyme is found in cotton, not sundew.

E. wrong: scorpioid cyme is found in cotton, not banana.

Question 29 Bacteria with flagella all over surface

Bacteria having flagella all over the surface:

- A. Lophotrichous
- B. Peritrichous ✓ **Correct answer**
- C. Atrichous
- D. Monotrichous
- E. Diplotrichous

A. wrong: lophotrichous bacteria have a tuft of flagella at one end.

B. correct: peritrichous bacteria have flagella all over their surface.

C. wrong: atrichous bacteria have no flagella.

D. wrong: monotrichous bacteria have a single flagellum at one end.

E. wrong: there is no 'diplotrichous' flagellar arrangement.

Question 30 Hormone changing trypsinogen to trypsin

A hormone secreted from the duodenal mucosa that changes the inactive trypsinogen

is:

- A. Peptone
- B. Ecdysone
- C. Enterokinase ✓ **Correct answer**
- D. Amylase
- E. Protease

A. wrong: peptone is a protein digest, not the hormone that activates trypsinogen.

B. wrong: ecdysone is an insect moulting hormone.

C. correct: enterokinase, secreted from the duodenal mucosa, changes inactive trypsinogen into trypsin.

D. wrong: amylase digests starch, it does not activate trypsinogen.

E. wrong: protease is a general protein-digesting enzyme, not the activator of trypsinogen.

Question 31 Cell becomes dead due to deposition of

Cell become dead due to the deposition of:

- A. Cellulose
- B. Cutin
- C. Chitin
- D. Lignin ✓ **Correct answer**
- E. Hemicellulose

A. wrong: cellulose does not kill the cell by deposition.

B. wrong: cutin is a waxy coating, not the deposit that kills the cell.

C. wrong: chitin is not deposited in plant cells.

D. correct: the deposition of lignin in the cell wall makes the cell dead (as in sclerenchyma and xylem vessels).

micellulose does not kill the cell by deposition.

Question 32 Rabies caused by

Rabies is caused by:

- A. Paramyxovirus
- B. Rhinovirus
- C. Arbovirus
- D. Rhabdovirus ✓ **Correct answer**
- E. Poliovirus

A. wrong: rabies is caused by a rhabdovirus, not a paramyxovirus.

B. wrong: rhinoviruses cause the common cold, not rabies.

C. wrong: arboviruses are transmitted by arthropods; rabies is caused by a rhabdovirus.

D. correct: rabies is caused by a rhabdovirus (bullet-shaped RNA virus).

E. wrong: poliovirus causes polio, not rabies.

Question 33 In AIDS 'D' stands for

In AIDS "D" stands for:

- A. Different
- B. Difficult
- C. Deficiency ✓ **Correct answer**
- D. Degenerate
- E. Decompose

A. wrong: in AIDS, 'D' stands for Deficiency.

B. wrong: in AIDS, 'D' stands for Deficiency.

C. correct: AIDS stands for Acquired Immuno-Deficiency Syndrome.

AIDS, 'D' stands for Deficiency.

E. wrong: in AIDS, 'D' stands for Deficiency.

Question 34 Loop weakening the initial stimulus

It is a loop or set or response shown by the effectors that weaken the affect of the initial stimuli:

- A. Negative feed back ✓ **Correct answer**
- B. Neutral condition
- C. Positive feed back
- D. Static state
- E. Thermal state

A. correct: a negative feedback loop is a response by the effectors that weakens the effect of the initial stimulus.

B. wrong: a neutral condition is not a feedback loop.

C. wrong: positive feedback strengthens the initial stimulus, it does not weaken it.

D. wrong: a static state is not a feedback loop.

E. wrong: a thermal state is not a feedback loop.

Question 35 Crossing over in meiosis — official key error corrected

Crossing over in meiosis occurs during the following stage:

- A. Diakinesis
- B. Diplotene
- C. Leptotene
- D. Zygotene

nytene ✓ **Correct answer**

A. wrong: diakinesis is the final stage of prophase I, after crossing over has occurred.

B. wrong: in diplotene the chiasmata become visible, but crossing over itself takes place in pachytene — the official Code-B key lists B, which is wrong.

C. wrong: in leptotene the chromosomes condense; crossing over has not yet occurred.

D. wrong: in zygotene homologous chromosomes pair (synapsis); crossing over occurs in the next stage.

E. correct: crossing over (exchange of segments between non-sister chromatids) takes place during pachytene of prophase I. (Official-key error: official Code-B key B corrected to E; decided by assistant under owner's 8 Nov 2026 delegation.)

Question 36 Co-enzyme percentage of enzyme

A co-enzyme constitutes about certain % of portion of entire enzyme:

- A. 5%
- B. 1% ✓ **Correct answer**
- C. 2%
- D. 3%
- E. 4%

A. wrong: a co-enzyme constitutes about 1% of the entire enzyme.

B. correct: a co-enzyme constitutes about 1% of the entire enzyme.

C. wrong: a co-enzyme constitutes about 1% of the entire enzyme.

D. wrong: a co-enzyme constitutes about 1% of the entire enzyme.

E. wrong: a co-enzyme constitutes about 1% of the entire enzyme.

37 DNA chains joined by

Each chain of DNA is formed by the union of many nucleotides by means of:

- A. Double bond
- B. Phosphodiester bonds ✓ **Correct answer**
- C. Covalent bond
- D. Hydrogen bond
- E. Single bond

A. wrong: nucleotides in a DNA chain are joined by phosphodiester bonds, not double bonds.

B. correct: each chain of DNA is formed by nucleotides joined by phosphodiester bonds.

C. wrong: phosphodiester bonds are the specific covalent bonds joining nucleotides in a DNA chain.

D. wrong: hydrogen bonds hold the two DNA strands together, they do not join nucleotides in a chain.

E. wrong: nucleotides in a DNA chain are joined by phosphodiester bonds, not single bonds in general.

Question 38 Mimosa pudica shows

Mimosa pudica shows:

- A. Thermonastic
- B. Haptonastic
- C. Nyctinastic
- D. Seismonastic ✓ **Correct answer**
- E. Photonastic

A. wrong: Mimosa pudica shows seismonastic movement, not thermonastic.

mosa pudica shows seismonastic movement (response to touch/shock), not haptonastic movement.

C. wrong: Mimosa pudica shows seismonastic movement, not nyctinastic (sleep) movement.

D. correct: Mimosa pudica shows seismonastic movement — its leaflets fold when touched or shaken.

E. wrong: Mimosa pudica shows seismonastic movement, not photonastic movement.

Question 39 Mendel's research plant

Mendel's for his research selected:

- A. Edible-pea
- B. Garden pea ✓ **Correct answer**
- C. Bean plant
- D. Wild pea
- E. Pea-nut

A. wrong: Mendel selected the garden pea, not the edible pea as named here.

B. correct: Mendel selected the garden pea (Pisum sativum) for his research.

C. wrong: Mendel selected the garden pea, not the bean plant.

D. wrong: Mendel selected the garden pea, not the wild pea.

E. wrong: Mendel selected the garden pea, not the peanut.

Question 40 Most common abundant lipid energy source

This lipid is most common abundant richest source of energy in plant, and animal body:

- A. Phospholipid
- B. Carotenoids

- D. Terpenes
- E. Acylglycerol ✓ **Correct answer**

A. wrong: phospholipids are membrane lipids, not the main energy-storage lipid.

B. wrong: carotenoids are pigments, not the main energy-storage lipid.

C. wrong: terpenoids are not the main energy-storage lipid.

D. wrong: terpenes are not the main energy-storage lipid.

E. correct: acylglycerols (triglycerides) are the most common and abundant lipids and the richest source of energy in plants and animals.

Question 41 Organs with same function, different structure

The organs perform same functions in different groups of organism but are different in this internal structure called as:

- A. Homologous organs
- B. Bisymmetry
- C. Analogous organs ✓ **Correct answer**
- D. Radial symmetry
- E. Asymmetry

A. wrong: homologous organs have the same internal structure but may have different functions.

B. wrong: bisymmetry is a type of symmetry, not organs with the same function.

C. correct: analogous organs perform the same function in different groups but differ in internal structure.

D. wrong: radial symmetry is a type of symmetry, not organs with the same function.

ymmetry is a lack of symmetry, not organs with the same function.

Question 42 Hard parts of seeds due to

The hard parts of the seeds is, due to the presence of:

- A. Collenchyma
- B. Sclerenchyma
- C. Sclereids ✓ **Correct answer**
- D. Fibres
- E. Parenchyma

A. wrong: collenchyma is a living supporting tissue, not the tissue of hard seed parts.

B. wrong: sclereids (a type of sclerenchyma) are the specific cells, not sclerenchyma in general.

C. correct: the hard parts of seeds are due to sclereids (stone cells).

D. wrong: fibres are elongated sclerenchyma cells, not the cells of hard seed parts.

E. wrong: parenchyma is soft tissue, not the tissue of hard seed parts.

Question 43 Virus Latin meaning

Virus is a latin word meaning:

- A. Sweet
- B. Sour
- C. Poison ✓ **Correct answer**
- D. Toxic
- E. Acidic

A. wrong: 'virus' is Latin for poison.

B. wrong: 'virus' is Latin for poison.

rus' is a Latin word meaning poison.

D. wrong: 'virus' is Latin for poison, not toxic.

E. wrong: 'virus' is Latin for poison, not acidic.

Question 44 Thick-walled chambers of heart located at

In the heart the thick-walled chambers are located at the:

- A. Apex ✓ **Correct answer**
- B. Lower side
- C. Lateral side
- D. Dorsal side
- E. Ventral side

A. correct: the thick-walled chambers (ventricles) are located at the apex (lower part) of the heart.

B. wrong: the keyed answer is the apex — the ventricles form the apex of the heart.

C. wrong: the thick-walled chambers are located at the apex, not the lateral side.

D. wrong: the thick-walled chambers are located at the apex, not the dorsal side.

E. wrong: the thick-walled chambers are located at the apex, not the ventral side.

Question 45 Thin appendages in bacterial conjugation

Extremely thin appendages helping during conjugation in bacteria:

- A. Pili ✓ **Correct answer**
- B. Membrane
- C. Flagella
- D. Tentacle
- E. Cilia

li (sex pili) are the extremely thin appendages that help during conjugation in bacteria.

B. wrong: the membrane does not help in conjugation.

C. wrong: flagella are for movement, not conjugation.

D. wrong: bacteria do not have tentacles.

E. wrong: bacteria do not have cilia.

Question 46 Colourless plastid

Colourless plastid is called:

- A. Leucoplast ✓ **Correct answer**
- B. Chromoplast
- C. Cyanoplast
- D. Erythroplast
- E. Chloroplast

A. correct: a colourless plastid is called a leucoplast.

B. wrong: chromoplasts are coloured plastids.

C. wrong: there is no 'cyanoplast'.

D. wrong: there is no 'erythroplast'.

E. wrong: chloroplasts are green plastids, not colourless.

Question 47 Evolution definition according to

Evolution is the transformation of the form & mode of existence of an organism in such manner that the descendants differ from their ancestor, according to:

- A. Weismann

- C. Charles
- D. Zimmermann
- E. Darwin ✓ **Correct answer**

A. wrong: the definition given is Darwin's, not Weismann's.

B. wrong: the definition given is Darwin's, not Lamarck's.

C. wrong: the definition is Darwin's (Charles Darwin), not 'Charles' alone.

D. wrong: the definition given is Darwin's, not Zimmermann's.

E. correct: evolution as the transformation of form and mode of existence so that descendants differ from ancestors is Darwin's definition.

Question 48 Uterus opens to vagina by

Uterus opens to the vagina by a narrow opening bounded by muscular sphincter at its bottom known as:

- A. Urinary bladder
- B. Cervix ✓ **Correct answer**
- C. Oviduct
- D. Labia
- E. Vagina

A. wrong: the urinary bladder is not the opening between uterus and vagina.

B. correct: the uterus opens to the vagina by the cervix, a narrow opening bounded by a muscular sphincter.

C. wrong: the oviduct connects the ovary to the uterus, not the uterus to the vagina.

D. wrong: the labia are external folds, not the opening between uterus and vagina.

e vagina is the canal itself, not the opening between uterus and vagina.

Question 49 Marine shelled sarcodians give clues to deposit of

Skeleton of marine shelled sarcodians give clues to possible deposit of:

- A. Potassium
- B. Magnesium
- C. Petroleum ✓ **Correct answer**
- D. Chromium
- E. Calcium

A. wrong: marine shelled sarcodians (foraminifera) give clues to petroleum deposits, not potassium.

B. wrong: marine shelled sarcodians give clues to petroleum deposits, not magnesium.

C. correct: the skeletons of marine shelled sarcodians (foraminifera) give clues to possible petroleum deposits.

D. wrong: marine shelled sarcodians give clues to petroleum deposits, not chromium.

E. wrong: marine shelled sarcodians give clues to petroleum deposits, not calcium.

Question 50 Spinal cord leaves cranium through

Spinal cord comes out from the cranium though a opening known as:

- A. Foramen magnum ✓ **Correct answer**
- B. Lumen
- C. Ganglion
- D. Acetabulum
- E. Glanoid cavity

A. correct: the spinal cord comes out of the cranium through the foramen magnum.

The lumen is the inside space of a tube, not the opening in the cranium.

C. wrong: a ganglion is a cluster of nerve cells, not the opening in the cranium.

D. wrong: the acetabulum is the hip socket, not the opening in the cranium.

E. wrong: the glenoid cavity is the shoulder socket, not the opening in the cranium.

Question 51 Endocytosis of solid material

Endocytosis which involve ingestion of solid material is called:

- A. Solidocytosis
- B. Phagocytosis ✓ **Correct answer**
- C. Exocytosis
- D. Pinocytosis
- E. Autocytosis

A. wrong: there is no 'solidocytosis' — the ingestion of solid material is phagocytosis.

B. correct: endocytosis involving the ingestion of solid material is called phagocytosis.

C. wrong: exocytosis is the expulsion of material from the cell, not ingestion.

D. wrong: pinocytosis is the ingestion of liquid material, not solid material.

E. wrong: there is no 'autocytosis' — the ingestion of solid material is phagocytosis.

Question 52 Plant-like protists

Plant like prototista called:

- A. Bryophytes
- B. Bacteria
- C. Fungi
- D. Tracheophytes
- E. Algae ✓ **Correct answer**

yophytes are plants (mosses), not protists.

B. wrong: bacteria are prokaryotes, not plant-like protists.

C. wrong: fungi are fungus-like, not plant-like protists.

D. wrong: tracheophytes are vascular plants, not protists.

E. correct: algae are the plant-like protists.

Question 53 Substrate induces conformational change

When substrate combines the active site of an enzyme it induces a conformational change that enable enzyme to perform:

- A. Analytic function
- B. Metabolism
- C. Meosis
- D. Mitosis
- E. Catalytic function ✓ **Correct answer**

A. wrong: the induced change enables the enzyme's catalytic function, not an analytic function.

B. wrong: the induced change enables the enzyme's catalytic function.

C. wrong: the induced change enables the enzyme's catalytic function, not meiosis.

D. wrong: the induced change enables the enzyme's catalytic function, not mitosis.

E. correct: when a substrate combines with the active site, it induces a conformational change that enables the enzyme to perform its catalytic function (induced-fit model).

Question 54 Mendel's contrasting characters

Mendel's selected following pair(s) of contrasting character:

- B. Seven pairs ✓ **Correct answer**
- C. Three pairs
- D. Four pairs
- E. Two pairs

A. wrong: Mendel selected seven pairs of contrasting characters.

B. correct: Mendel selected seven pairs of contrasting characters in the garden pea.

C. wrong: Mendel selected seven pairs of contrasting characters.

D. wrong: Mendel selected seven pairs of contrasting characters.

E. wrong: Mendel selected seven pairs of contrasting characters.

Question 55 Powerhouse of the cell

Powerhouse of the cell is:

- A. Ribosomes
- B. Endoplasmic reticulum
- C. Chloroplasts
- D. Mitochondria ✓ **Correct answer**
- E. Chromoplasts

A. wrong: ribosomes synthesise proteins, they are not the powerhouse of the cell.

B. wrong: the endoplasmic reticulum transports and processes materials, it is not the powerhouse of the cell.

C. wrong: chloroplasts carry out photosynthesis, they are not the powerhouse of the cell.

D. correct: mitochondria produce ATP and are called the powerhouse of the cell.

E. wrong: chromoplasts are coloured plastids, they are not the powerhouse of the cell.

56 Tidal volume — DEFECTIVE, no correct option

The tidal volume of lungs at rest or during normal breath is:

- A. 4 liters
- B. 6 liters
- C. 5 liters
- D. 3 liters
- E. 2 liters

No answer is given for this question, and none is taught. DEFECTIVE-excluded (no correct option: tidal volume is about 500 ml, not among 2/3/4/5/6 litres — see note)

A. wrong: the tidal volume is about 500 ml (0.5 litres), not 4 litres.

B. wrong: the tidal volume is about 500 ml (0.5 litres), not 6 litres.

C. wrong: the tidal volume is about 500 ml (0.5 litres), not 5 litres.

D. wrong: the tidal volume is about 500 ml (0.5 litres), not 3 litres.

E. wrong: the tidal volume is about 500 ml (0.5 litres), not 2 litres — the official Code-B key lists E, which is also wrong. (DEFECTIVE: no option is correct — the tidal volume at rest is about 500 ml, which is not among the options; decided by assistant under owner's 8 Nov 2026 delegation.)

Question 57 Receptors detecting pain and tissue damage

They detect pain and tissue damage:

- A. Baroreceptors
- B. Chemoreceptor
- C. Photoreceptor
- D. Nocireceptors ✓ **Correct answer**
- E. Mechanoreceptor

roreceptors detect blood pressure, not pain.

B. wrong: chemoreceptors detect chemicals, not pain.

C. wrong: photoreceptors detect light, not pain.

D. correct: nociceptors (printed 'Nocireceptors') detect pain and tissue damage.

E. wrong: mechanoreceptors detect touch and pressure, not pain.

Question 58 Single-trait phenotypic ratio

Phenotypic ratio of single trait inheritance:

- A. 1:21
- B. 3:1 ✓ **Correct answer**
- C. 1:2
- D. 1:3:2
- E. 1:1

A. wrong: the phenotypic ratio of single-trait (monohybrid) inheritance is 3:1.

B. correct: the phenotypic ratio of a monohybrid cross is 3:1.

C. wrong: the phenotypic ratio of single-trait inheritance is 3:1.

D. wrong: the phenotypic ratio of single-trait inheritance is 3:1.

E. wrong: the phenotypic ratio of single-trait inheritance is 3:1.

Question 59 Artificial selection evidence for evolution

Artificial selection in breeding provides evidence for evolution is known as:

- A. Domestication ✓ **Correct answer**
- B. Deme
- C. Gene pool

- E. Genetic death

A. correct: artificial selection in breeding (domestication) provides evidence for evolution.

B. wrong: a deme is a local population, not artificial selection.

C. wrong: the gene pool is the sum of genes in a population, not artificial selection.

D. wrong: a desired trait is the aim of selection, not the name of the evidence.

E. wrong: genetic death is not artificial selection.

Question 60 Amylose glycosidic linkage

Molecules of amylose consists of unbranched chains of hundreds of glucoses sub units, join together by:

- A. 1-2 glycosidic linkage
- B. 2-3 glycosidic linkage
- C. 1-4 glycosidic linkage ✓ **Correct answer**
- D. 1-3 glycosidic linkage
- E. 1-6 glycosidic linkage

A. wrong: amylose chains are joined by 1-4 glycosidic linkages.

B. wrong: amylose chains are joined by 1-4 glycosidic linkages.

C. correct: amylose consists of unbranched chains of glucose units joined by 1-4 (alpha-1,4) glycosidic linkages.

D. wrong: amylose chains are joined by 1-4 glycosidic linkages.

E. wrong: 1-6 linkages occur at branch points (as in amylopectin), not in unbranched amylose.

61 Coastline protection, shelter, carbon and nitrogen fixing

It provides protection of coastline from storm, shelter for marine organisms, assist in carbon & nitrogen fixing:

- A. Polyps
- B. Coral reefs ✓ **Correct answer**
- C. Medusa
- D. Aurelia
- E. Hydra

A. wrong: polyps are individual cnidarian animals, not the reef system described.

B. correct: coral reefs protect coastlines from storms, shelter marine organisms and assist in carbon and nitrogen fixing.

C. wrong: medusa is the free-swimming cnidarian form, not the reef system described.

D. wrong: Aurelia is a jellyfish, not the reef system described.

E. wrong: Hydra is a freshwater cnidarian, not the reef system described.

Question 62 Enzyme dimple or groove

Each enzyme has a dimple or groove at a specific side called:

- A. Co-factor
- B. Active site ✓ **Correct answer**
- C. Non active site
- D. Substrate
- E. Prosthetic group

A. wrong: a co-factor is a non-protein helper, not the groove on an enzyme.

B. correct: each enzyme has a dimple or groove at a specific side called the active site,

ıbstrate binds.

C. wrong: the groove is the active site, not a non-active site.

D. wrong: the substrate is the molecule acted on, not the groove on the enzyme.

E. wrong: a prosthetic group is a tightly bound co-factor, not the groove on an enzyme.

Question 63 Light reaction site

Light reaction of photosynthesis takes place in:

- A. Cristae
- B. Stroma
- C. Cisternac
- D. Matrix
- E. Thylakoid ✓ **Correct answer**

A. wrong: cristae are folds of the inner mitochondrial membrane, not the site of the light reaction.

B. wrong: the stroma is the site of the dark reaction (Calvin cycle), not the light reaction.

C. wrong: cisternae are not the site of the light reaction.

D. wrong: the matrix is part of the mitochondrion, not the site of the light reaction.

E. correct: the light reaction of photosynthesis takes place in the thylakoids of the chloroplast.

Question 64 Vacated follicle forms yellow structure

The vacated vesicular follicle forms a fatty yellow structure on ovary called as:

- A. Graafian luteum
- B. Corpus luteum ✓ **Correct answer**
- C. Ruptured ovum

- E. Progestron

A. wrong: the structure is the corpus luteum, not a 'Graafian luteum'.

B. correct: the vacated vesicular (Graafian) follicle forms a fatty yellow structure on the ovary called the corpus luteum.

C. wrong: the ruptured ovum is the released egg, not the yellow structure.

D. wrong: the follicle is the structure before ovulation, not the yellow structure formed after it.

E. wrong: progesterone is the hormone secreted by the corpus luteum, not the structure itself.

Question 65 Achatina fulica danger

Achatina fulica is an African giant snail that is dangerous:

- A. Agricultural pest ✓ **Correct answer**
- B. For silk worm
- C. For paper industry
- D. Apiculture pest
- E. Sericulture pest

A. correct: Achatina fulica (African giant snail) is a dangerous agricultural pest.

B. wrong: Achatina fulica is an agricultural pest, not a pest of silkworms.

C. wrong: Achatina fulica is an agricultural pest, not a pest of the paper industry.

D. wrong: Achatina fulica is an agricultural pest, not a pest of beekeeping.

E. wrong: Achatina fulica is an agricultural pest, not a pest of sericulture.

66 Enzyme used in Calvin cycle

The enzyme which is used in calvin cycle is:

- A. Oxidase
- B. Reductase
- C. Isomerase
- D. Rubisco ✓ **Correct answer**
- E. Pepsin

A. wrong: the key Calvin cycle enzyme is Rubisco, not an oxidase.

B. wrong: the key Calvin cycle enzyme is Rubisco, not a reductase.

C. wrong: the key Calvin cycle enzyme is Rubisco, not an isomerase.

D. correct: Rubisco (ribulose bisphosphate carboxylase/oxygenase) is the enzyme used in the Calvin cycle to fix CO_2.

E. wrong: pepsin is a digestive enzyme, not a Calvin cycle enzyme.

Question 67 Cartilage denatured by calcium deposition

The flexible articulating cartilage between the joints becomes denatured by the deposition of calcium which makes the bone hard. The disease is:

- A. Disc slip
- B. Rickets
- C. Spondylosis
- D. Arthritis ✓ **Correct answer**
- E. Sciatica

A. wrong: a slipped disc is a displacement of the intervertebral disc, not the disease described.

B. wrong: rickets is a vitamin D deficiency disease of children, not the disease described.

ondylosis is degeneration of the spine, not the joint disease described.

D. correct: the flexible articulating cartilage between the joints becomes denatured by calcium deposition, making the bone hard — arthritis.

E. wrong: sciatica is nerve pain down the leg, not the joint disease described.

Question 68 Haemoglobin molecules in each RBC

HB molecules in each RBCs:

- A. 280 millions ✓ **Correct answer**
- B. 150 millions
- C. 380 millions
- D. 170 millions
- E. 180 millions Chemistry

A. correct: each red blood cell contains about 280 million haemoglobin molecules.

B. wrong: each RBC contains about 280 million haemoglobin molecules, not 150 million.

C. wrong: each RBC contains about 280 million haemoglobin molecules, not 380 million.

D. wrong: each RBC contains about 280 million haemoglobin molecules, not 170 million.

E. wrong: each RBC contains about 280 million haemoglobin molecules, not 180 million.

Question 69 Exothermic reaction, temperature decreased, K

In exothermic reaction, by decreasing the temperature, equilibrium constant:

- A. Same
- B. Sometimes decreases sometimes increases
- C. Reaction moves backward
- D. Decreases
- E. Increases ✓ **Correct answer**

creasing the temperature of an exothermic reaction increases the equilibrium constant.

B. wrong: for an exothermic reaction, decreasing temperature increases K.

C. wrong: decreasing temperature moves an exothermic reaction forward, not backward.

D. wrong: decreasing the temperature of an exothermic reaction increases K.

E. correct: by Le Chatelier's principle, lowering the temperature favours the exothermic forward reaction, so the equilibrium constant increases.

Question 70 Viscosity measure of

Viscosity is the measure of:

- A. Volume
- B. Resistance in the flow of a liquid ✓ **Correct answer**
- C. Fluidity of liquid
- D. Mass
- E. Density

A. wrong: viscosity is the measure of resistance to flow, not volume.

B. correct: viscosity is the measure of the resistance in the flow of a liquid.

C. wrong: fluidity is the opposite of viscosity, not what viscosity measures.

D. wrong: viscosity is the measure of resistance to flow, not mass.

E. wrong: viscosity is the measure of resistance to flow, not density.

Question 71 Acetone gives — official key error corrected

Acetone gives:

- A. Fehling solution test positive

- C. Lucas test positive
- D. Iodoform test positive ✓ **Correct answer**
- E. Benedicts test positive

A. wrong: ketones do not reduce Fehling's solution (that test is for aldehydes) — the official Code-B key lists A, which is wrong.

B. wrong: the silver mirror (Tollens) test is for aldehydes, not for acetone.

C. wrong: the Lucas test is for alcohols, not for acetone.

D. correct: acetone is a methyl ketone, so it gives a positive iodoform test.

E. wrong: Benedict's test is for reducing sugars/aldehydes, not for acetone. (Official-key error: official Code-B key A corrected to D; decided by assistant under owner's 8 Nov 2026 delegation.)

Question 72 Hydrogen spectrum equation, n > 2 from level 2

The equation $\bar{\nu} = RH \{1/2^2 - 1/n^2\}$ where n > 2 is the equation of H spectrum for.

- A. Paschen series
- B. Pfund series
- C. Bracket series
- D. Lyman series
- E. Balmar series ✓ **Correct answer**

A. wrong: the Paschen series ends at n = 3, not n = 2.

B. wrong: the Pfund series ends at n = 5, not n = 2.

C. wrong: the Brackett series ends at n = 4, not n = 2.

D. wrong: the Lyman series ends at n = 1, not n = 2.

= $R_H(1/2^2 - 1/n^2)$, n > 2, is the equation of the Balmer series (transitions ending at n = 2).

Question 73 First law at constant volume

The equation of the first law of thermodynamics q= ΔE + W, will reduce at constant volume to:

- A. ΔE + W
- B. qv = ΔE + PAV
- C. qv = ΔE + W
- D. qv = ΔE ✓ **Correct answer**
- E. qv = PΔGV

A. wrong: at constant volume W = 0, so q = ΔE (qv = ΔE).

B. wrong: at constant volume qv = ΔE, not ΔE + PΔV.

C. wrong: at constant volume W = 0, so qv = ΔE.

D. correct: at constant volume no work is done (W = 0), so q = ΔE + W reduces to qv = ΔE.

E. wrong: at constant volume qv = ΔE.

Question 74 Electrolysis of dilute acid — official key error corrected

The electrolysis of dilute acid solution gives:

- A. Cl_2 at cathode & H_2 at anode
- B. H_2 at cathode & Cl_2 at anode
- C. H_2 at cathode & O_2 at anode ✓ **Correct answer**
- D. H_2 at anode & Na at cathode
- E. H_2 at anode & O_2 at cathode

drogen is produced at the cathode, not the anode, and chlorine is not produced from a dilute acid.

B. wrong: chlorine is discharged at the anode only from concentrated hydrochloric acid; from a dilute acid, hydroxide is discharged and oxygen is produced — the official Code-B key lists B, which is wrong.

C. correct: in the electrolysis of a dilute acid, H_2 is produced at the cathode and O_2 at the anode (hydroxide ions are discharged preferentially in dilute solution).

D. wrong: hydrogen is produced at the cathode, and sodium is not produced from a dilute acid.

E. wrong: hydrogen is produced at the cathode and oxygen at the anode, not the other way round. (Official-key error: official Code-B key B corrected to C; decided by assistant under owner's 8 Nov 2026 delegation.)

Question 75 Ostwald's process oxidises

Oswald's process is the oxidation of

- A. H_2S
- B. NH3 ✓ **Correct answer**
- C. HNO3
- D. H_2SO4
- E. Cl_2

A. wrong: Ostwald's process is the oxidation of ammonia, not H_2S.

B. correct: Ostwald's process is the oxidation of ammonia (NH_3) to manufacture nitric acid.

C. wrong: nitric acid is the product of Ostwald's process, not what is oxidised.

D. wrong: sulphuric acid is made by the Contact process, not Ostwald's process.

E. wrong: Ostwald's process is the oxidation of ammonia, not chlorine.

76 Dipole moment of CO_2 is zero

The dipolar moment of CO_2 is zero because it is:

- A. Angular
- B. Linear ✓ **Correct answer**
- C. Triatomic
- D. Pyramidal
- E. CO_2 is polar

A. wrong: CO_2 is linear, not angular.

B. correct: CO_2 is a linear molecule, so its two equal and opposite bond dipoles cancel and its dipole moment is zero.

C. wrong: being triatomic does not by itself make the dipole moment zero — it is the linear shape that does.

D. wrong: CO_2 is linear, not pyramidal.

E. wrong: CO_2 is non-polar because its dipole moment is zero.

Question 77 $NaNO_3$ and $CaCO_3$ both trigonal

The two crystals Na NO3 & CaCO3 are both trigonal, they are:

- A. Isomers
- B. Polymorphs
- C. Allotropes
- D. Enantiomers
- E. Isomorph ✓ **Correct answer**

A. wrong: $NaNO_3$ and $CaCO_3$ are not isomers.

B. wrong: polymorphs are different crystal forms of the same compound.

C. wrong: allotropes are different forms of the same element.

antiomers are mirror-image molecules, not different compounds with the same crystal form.

E. correct: $NaNO_3$ and $CaCO_3$ both crystallise in the trigonal system with similar structures — they are isomorphs.

Question 78 Nylon-66 is a

Nylon66 is a:

- A. Addition polymer
- B. Condensation polymer of hexandioic acid & 1,6 diamino hexane ✓ **Correct answer**
- C. It is an ester
- D. Condensation polymer
- E. It is a carboxylic acid

A. wrong: Nylon-66 is a condensation polymer, not an addition polymer.

B. correct: Nylon-66 is a condensation polymer of hexanedioic acid (adipic acid) and 1,6-diaminohexane.

C. wrong: Nylon-66 is a polyamide, not an ester.

D. wrong: this is true but incomplete — the keyed answer names the two monomers.

E. wrong: Nylon-66 is a polymer, not a carboxylic acid.

Question 79 Ethene hybridisation

Ehene (H2C = CH2) has hybridization of C-atom:

- A. dsp3
- B. sp
- C. sp3
- D. d2sp3

A. wrong: the carbon atoms in ethene are sp^2 hybridised, not dsp^3.

B. wrong: the carbon atoms in ethene are sp^2 hybridised, not sp.

C. wrong: the carbon atoms in ethene are sp^2 hybridised, not sp^3.

D. wrong: the carbon atoms in ethene are sp^2 hybridised, not d^2sp^3.

E. correct: each carbon atom in ethene ($H_2C=CH_2$) is sp^2 hybridised.

Question 80 Kinetic molecular theory explains

The kinetic molecular theory of gases explains:

- A. Mass number
- B. Atoms number
- C. The behavior of gases ✓ **Correct answer**
- D. Electron
- E. Neutron

A. wrong: the kinetic molecular theory explains the behaviour of gases, not mass number.

B. wrong: the kinetic molecular theory explains the behaviour of gases, not atomic number.

C. correct: the kinetic molecular theory of gases explains the behaviour of gases.

D. wrong: the kinetic molecular theory explains the behaviour of gases, not electrons.

E. wrong: the kinetic molecular theory explains the behaviour of gases, not neutrons.

Question 81 2-chloropropane + Na → 2,3-dimethylbutane

2-chloropropane is heated with Na metal product is 2.3-dimethyl butane, reaction is.

ydrohalogenation

- B. Wurtz reaction ✓ **Correct answer**
- C. Dehydration
- D. Catalytic hydrogenation
- E. Dehalogenation

A. wrong: dehydrohalogenation removes HX to form an alkene, it does not couple two alkyl halides.

B. correct: 2-chloropropane heated with sodium metal gives 2,3-dimethylbutane by the Wurtz reaction (coupling of two alkyl halides).

C. wrong: dehydration removes water, it does not couple alkyl halides.

D. wrong: catalytic hydrogenation adds hydrogen across a double bond, it does not couple alkyl halides.

E. wrong: dehalogenation removes halogen, it does not couple two alkyl halides into 2,3-dimethylbutane.

Question 82 At equilibrium in a reversible reaction

At equilibrium in a reversible reaction:

- A. The rate of backward reaction > rate of forward reaction
- B. The rate of forward reaction > rate of backward reaction
- C. The rate of forward reaction is same as rate of backward reaction
- D. The concentration of reactants & products becomes constant & the rate of forward reaction is same as the rate of backward reaction ✓ **Correct answer**
- E. The concentration of reactant & products becomes constant

A. wrong: at equilibrium the two rates are equal.

B. wrong: at equilibrium the two rates are equal.

s is true but incomplete — the concentrations also become constant, which is the keyed answer.

D. correct: at equilibrium the concentrations of reactants and products become constant and the forward and backward rates are equal.

E. wrong: this is true but incomplete — the rates are also equal, which is the keyed answer.

Question 83 Catalyst increases rate because

Rate of reaction increases by the addition of catalyst because:

- A. Catalyst reacts with reactant
- B. Catalysts reacts with product
- C. Energy of activation decreases ✓ **Correct answer**
- D. Energy of activation increases
- E. Energy of activation remains same

A. wrong: a catalyst increases the rate by lowering the activation energy, not by reacting with the reactant.

B. wrong: a catalyst increases the rate by lowering the activation energy, not by reacting with the product.

C. correct: a catalyst provides an alternative pathway with a lower energy of activation, so the rate increases.

D. wrong: a catalyst decreases the activation energy, it does not increase it.

E. wrong: a catalyst decreases the activation energy, it does not leave it the same.

Question 84 $H_2 + Cl_2 \rightarrow 2HCl$ reaction order

Reaction H2+Cla→ 2HCI is a:

- B. First order
- C. Half order
- D. Third order
- E. Zero order ✓ **Correct answer**

A. wrong: the (photochemical) reaction between H_2 and Cl_2 is given as a zero-order reaction in the textbook.

B. wrong: the (photochemical) reaction between H_2 and Cl_2 is given as a zero-order reaction in the textbook.

C. wrong: the (photochemical) reaction between H_2 and Cl_2 is given as a zero-order reaction in the textbook.

D. wrong: the (photochemical) reaction between H_2 and Cl_2 is given as a zero-order reaction in the textbook.

E. correct: the photochemical reaction between hydrogen and chlorine is a zero-order reaction (its rate depends on light intensity, not on the concentrations).

Question 85 Diffusion rate ratio $H_2 : O_2$

The comparison of rate of diffusion of H2 & O_2 is in the ratio of:

- A. 2 :1
- B. 1 : 4
- C. 3 : 2
- D. 4 : 1 ✓ **Correct answer**
- E. 1 : 2

A. wrong: by Graham's law the ratio is √(32/2) = 4:1.

B. wrong: hydrogen diffuses faster than oxygen, so the ratio is 4:1, not 1:4.

Graham's law the ratio is 4:1.

D. correct: by Graham's law, the rate of diffusion of H_2 to O_2 is √(32/2) = 4:1.

E. wrong: by Graham's law the ratio is 4:1.

Question 86 Grignard + methyl halide — DEFECTIVE, no correct option

Grignard reagent, eg Methyl magnesium halide reacting with Methyl halide, product is:

- A. N - propyl chloride
- B. Butane
- C. Iso - propyl chloride
- D. Methane
- E. Ethene

No answer is given for this question, and none is taught. DEFECTIVE-excluded (no correct option: Grignard + methyl halide gives ethane, not among the options — see note)

A. wrong: methyl magnesium halide reacting with methyl halide gives ethane (CH_3–CH_3), not N-propyl chloride.

B. wrong: the coupling product is ethane, not butane.

C. wrong: the coupling product is ethane, not iso-propyl chloride.

D. wrong: methane is the product of a Grignard reagent with water, not with methyl halide — the coupling product is ethane.

E. wrong: the coupling product is ethane (CH_3–CH_3), not ethene (CH_2=CH_2) — the official Code-B key lists E, which is also wrong. (DEFECTIVE: no option is correct — the product is ethane, which is not among the options; decided by assistant under owner's 8 Nov 2026 delegation.)

87 HOOC–COOH IUPAC name

HOOC - COOH has IUPAC name:

- A. Acetic acid
- B. Oxalic acid
- C. diethanoic acid
- D. ethandioic acid ✓ **Correct answer**
- E. Benzoic acid

A. wrong: acetic acid is CH_3COOH, not HOOC–COOH.

B. wrong: oxalic acid is the common name of HOOC–COOH, not its IUPAC name.

C. wrong: the IUPAC name of HOOC–COOH is ethandioic acid, not diethanoic acid.

D. correct: the IUPAC name of oxalic acid (HOOC–COOH) is ethandioic acid.

E. wrong: benzoic acid is C_6H_5COOH, not HOOC–COOH.

Question 88 Pulverised $CaCO_3$ reacts faster

Pulverized CaCu3 reacts faster because of the increase in:

- A. Pressure
- B. Surface area ✓ **Correct answer**
- C. Volume
- D. Surface tension
- E. Temperature

A. wrong: pulverised $CaCO_3$ reacts faster because of increased surface area, not pressure.

B. correct: pulverised (powdered) $CaCO_3$ reacts faster because its surface area is increased.

C. wrong: pulverised $CaCO_3$ reacts faster because of increased surface area, not volume.

ılverised $CaCO_3$ reacts faster because of increased surface area, not surface tension.

E. wrong: pulverised $CaCO_3$ reacts faster because of increased surface area, not temperature. (Note: the paper prints 'CaCu3' for $CaCO_3$.)

Question 89 Oxidation of K_2MnO_4 by Cl_2 manufactures

Oxidation of K2MnO4 by Cl2 is to manufacture

- A. K2CrO4
- B. MnO_2
- C. $K_2Cr_2O_4$
- D. KMnO4 ✓ **Correct answer**
- E. O_2

A. wrong: oxidation of K_2MnO_4 by Cl_2 manufactures $KMnO_4$, not K_2CrO_4.

B. wrong: oxidation of K_2MnO_4 by Cl_2 manufactures $KMnO_4$, not MnO_2.

C. wrong: oxidation of K_2MnO_4 by Cl_2 manufactures $KMnO_4$, not $K_2Cr_2O_4$.

D. correct: oxidation of potassium manganate (K_2MnO_4) by chlorine manufactures potassium permanganate ($KMnO_4$).

E. wrong: oxidation of K_2MnO_4 by Cl_2 manufactures $KMnO_4$, not oxygen.

Question 90 Aldehyde reacts with

Aldehyde reacts with:

- A. Ketones are more easily oxidized
- B. It is always difficult to oxidase aldehyde Mild oxidizing agent & strong oxidizing agent both
- C. Mild oxidizing agent & strong oxidizing agent both ✓ **Correct answer**
- D. Only strong oxidizing agent

/ mild oxidizing agent

A. wrong: aldehydes are more easily oxidised than ketones, not the other way round.

B. wrong: aldehydes are easily oxidised by both mild and strong oxidising agents.

C. correct: aldehydes react with (are oxidised by) both mild oxidising agents (e.g. Tollens' reagent) and strong oxidising agents.

D. wrong: aldehydes are oxidised by mild oxidising agents as well as strong ones.

E. wrong: aldehydes are oxidised by strong oxidising agents as well as mild ones. (Note: the third option is printed in the paper without a letter label; it is read positionally as option C.)

Question 91 Benzene alkylation, nitration and oxidation

Benzene is subjected to alkylation nitration & oxidation the product is:

- A. o & p nitro toluene
- B. m-nitro benzoic acid
- C. m-nitro toluene
- D. o & p nitro benzoic acid ✓ **Correct answer**
- E. o-nitro benzoic acid

A. wrong: after oxidation of the methyl group, the product is o- and p-nitrobenzoic acid, not nitrotoluene.

B. wrong: alkylation gives toluene, whose nitration is ortho/para directing, so the meta product is not formed.

C. wrong: nitration of toluene gives ortho and para products, not meta.

D. correct: benzene is alkylated to toluene, nitrated to o- and p-nitrotoluene, and oxidised to o- and p-nitrobenzoic acid.

th the ortho and para products are formed, not the ortho product alone.

Question 92 Castner–Kellner cell

In Castner Kellner cell:

- A. NaOH + H2 are produced at cathode
- B. Cl2 is produced at anode
- C. NaOH + H2 are produced at anode
- D. NaOH + H2 are produced at cathode & Cl2 is produced at anode ✓ **Correct answer**
- E. Cl2 is produced at cathode

A. wrong: NaOH + H_2 are produced at the cathode AND Cl_2 at the anode — this option is incomplete.

B. wrong: Cl_2 is produced at the anode AND NaOH + H_2 at the cathode — this option is incomplete.

C. wrong: NaOH + H_2 are produced at the cathode, not the anode.

D. correct: in the Castner–Kellner cell, NaOH + H_2 are produced at the cathode and Cl_2 at the anode.

E. wrong: Cl_2 is produced at the anode, not the cathode.

Question 93 Bakelite polymer of

Bakelite is polymer of:

- A. Two glucose molecules
- B. Formaldehyde & acetone
- C. Two amino acid molecule
- D. Formaldehyde & phenol ✓ **Correct answer**
- E. Acetone & carboxylic acid

kelite is a polymer of formaldehyde and phenol, not glucose.

B. wrong: Bakelite is a polymer of formaldehyde and phenol, not acetone.

C. wrong: Bakelite is a polymer of formaldehyde and phenol, not amino acids.

D. correct: Bakelite is a polymer of formaldehyde and phenol (phenol-formaldehyde resin).

E. wrong: Bakelite is a polymer of formaldehyde and phenol, not acetone and carboxylic acid.

Question 94 Phenol nitration product

Phenol when subjected to nitration product is:

- A. o - nitro phenol
- B. p - nitrophenol
- C. o - nitro phenol & m - nitrophenol
- D. o - nitro phenol & p - nitro phenol ✓ **Correct answer**
- E. m - nitro phenol

A. wrong: nitration of phenol gives both ortho- and para-nitrophenol, not the ortho product alone.

B. wrong: nitration of phenol gives both ortho- and para-nitrophenol, not the para product alone.

C. wrong: the hydroxyl group is ortho/para directing, so no meta product is formed.

D. correct: nitration of phenol gives o-nitrophenol and p-nitrophenol.

E. wrong: the hydroxyl group is ortho/para directing, so no meta product is formed.

Question 95 Chromite + K_2CO_3 in air manufactures

Heating a mixture of chromite are (FeOCr.Os) & KCO; in air is to manufacture:

nO4

- B. K_2CrO_4
- C. $KMnO_4$
- D. KI
- E. K_2CrO_4 ✓ **Correct answer**

A. wrong: heating chromite ore with K_2CO_3 in air manufactures potassium chromate, not potassium manganate.

B. wrong: the keyed answer is E (potassium chromate) — option B is printed identically to E in the paper (a print defect: the subscript 4s were dropped in typesetting, so both options read 'K2CrO').

C. wrong: heating chromite ore with K_2CO_3 in air manufactures potassium chromate, not potassium permanganate.

D. wrong: heating chromite ore with K_2CO_3 in air manufactures potassium chromate, not potassium iodide.

E. correct: heating chromite ore ($FeO{\cdot}Cr_2O_3$) with K_2CO_3 in air manufactures potassium chromate (K_2CrO_4). (Note: the paper's typesetting dropped the subscript 4s, so options B and E are printed identically as 'K2CrO' and option A as 'KzMnO'; the formulas are restored here and the defect is recorded.)

Question 96 Strong electrolyte

A strong electrolyte is one that _____ completely in solution:

- A. Reacts
- B. Decomposes
- C. Disappears
- D. Ionizes ✓ **Correct answer**
- E. Never ionizes

A. wrong: a strong electrolyte is one that ionises completely in solution.

strong electrolyte is one that ionises completely in solution.

C. wrong: a strong electrolyte is one that ionises completely in solution.

D. correct: a strong electrolyte is one that ionises completely in solution.

E. wrong: a strong electrolyte ionises completely, it does not never ionise.

Question 97 Cation and anion forming crystal lattices

Cation & Anion formed which combines to form crystal lattices:

- A. Only cation is isoelectronic to nearest noble gas
- B. Cation & anion both are isoelectronic to nearest noble gas
- C. Cation & anion both are isoelectronic to nearest noble gas & No of electron lost by metal & no of electron gained by non metal are equal ✓ **Correct answer**
- D. Only anion is isoelectronic to nearest noble gas
- E. No of electron lost by metal & no of electron gained by non metal are equal

A. wrong: both the cation and the anion are isoelectronic to the nearest noble gas, and the electron counts are equal.

B. wrong: this is true but incomplete — the electron counts must also be equal, which is the keyed answer.

C. correct: in forming a crystal lattice, both cation and anion are isoelectronic to the nearest noble gas, and the number of electrons lost by the metal equals the number gained by the non-metal.

D. wrong: both cation and anion are isoelectronic to the nearest noble gas.

E. wrong: this is true but incomplete — both ions must also be isoelectronic to the nearest noble gas.

98 Secondary alcohols have

Secondary alcohols have:

- A. One βc
- B. Three βc
- C. No βc
- D. Two βc ✓ **Correct answer**
- E. Four βc

A. wrong: a secondary alcohol has two β-carbons.

B. wrong: a secondary alcohol has two β-carbons.

C. wrong: a secondary alcohol has two β-carbons.

D. correct: a secondary alcohol (R_2CHOH) has two β-carbons (the two carbons attached to the α-carbon).

E. wrong: a secondary alcohol has two β-carbons.

Question 99 Small diffusion in solid

Small diffusion in solid is due to:

- A. Very fast motion of its particle
- B. Vibrational motions of its particle ✓ **Correct answer**
- C. Rotational motion of its particle
- D. Translational motion of its particle
- E. Diffusion into solid is not present

A. wrong: particles in a solid do not move very fast; diffusion is small because they only vibrate.

B. correct: diffusion in a solid is small because its particles only have vibrational motion about fixed positions.

rticles in a solid do not rotate freely.

D. wrong: particles in a solid do not have translational motion.

E. wrong: diffusion in a solid is present but small.

Question 100 Gases deviate from ideal behaviour

Gases deviate from ideal behavior more:

- A. Gases do not deviate from ideal behavior
- B. Both temperature & pressure low
- C. Both temperature & pressure high
- D. At high pressure & low temperature ✓ **Correct answer**
- E. At low pressure & high temperature

A. wrong: gases do deviate from ideal behaviour, most at high pressure and low temperature.

B. wrong: gases deviate most at high pressure and low temperature, not low pressure.

C. wrong: gases deviate most at high pressure and low temperature, not high temperature.

D. correct: gases deviate from ideal behaviour most at high pressure and low temperature (when intermolecular forces matter most and volume is significant).

E. wrong: gases behave most ideally at low pressure and high temperature.

Question 101 3.0 g carbon combustion

3.0 g of C on combustion gives $C + O_2 \rightarrow CO_2$

- A. 5.5 g of CO_2
- B. 22 g of CO_2
- C. 6.02×10^{23} molecules of CO_2

- E. 1.505×10^{23} molecules of CO_2 ✓ **Correct answer**

A. wrong: 3.0 g of carbon (0.25 mol) gives 0.25 mol of CO_2, which is 1.505×10^{23} molecules, not 5.5 g.

B. wrong: 3.0 g of carbon gives 0.25 mol of CO_2 (1.505×10^{23} molecules), not 22 g.

C. wrong: 3.0 g of carbon is 0.25 mol, giving $0.25 \times 6.02 \times 10^{23} = 1.505 \times 10^{23}$ molecules, not 6.02×10^{23}.

D. wrong: 3.0 g of carbon gives 1.505×10^{23} molecules of CO_2, not 3.01×10^{23}.

E. correct: 3.0 g C = 0.25 mol C, which on combustion gives 0.25 mol CO_2 = $0.25 \times 6.02 \times 10^{23} = 1.505 \times 10^{23}$ molecules.

Question 102 Alkyl halide + NaOH mechanism

Alkyl halide, on reaction with NaOH, product is an alkane. Mechanics of reaction is:

- A. S_n ✓ **Correct answer**
- B. Elimination
- C. Decomposition
- D. Electrophilic substitution reaction
- E. Addition

A. correct: an alkyl halide reacting with NaOH (nucleophilic substitution) follows the S_N mechanism.

B. wrong: elimination gives an alkene, not the substitution product of an alkyl halide with NaOH.

C. wrong: the reaction is nucleophilic substitution, not decomposition.

D. wrong: the reaction is nucleophilic substitution, not electrophilic substitution.

e reaction is nucleophilic substitution, not addition. (Note: the stem says the product is an alkane, which is a misstatement in the paper — the mechanism asked for is nucleophilic substitution.)

Question 103 First organic compound from inorganic

The first organic compound manufactured from inorganic compound was:

- A. Ethyl acetate
- B. Urea ✓ **Correct answer**
- C. Acetic acid
- D. Methane
- E. Acetone

A. wrong: the first organic compound made from an inorganic compound was urea, not ethyl acetate.

B. correct: urea was the first organic compound manufactured from an inorganic compound (Wöhler, 1828, from ammonium cyanate).

C. wrong: the first organic compound made from an inorganic compound was urea, not acetic acid.

D. wrong: the first organic compound made from an inorganic compound was urea, not methane.

E. wrong: the first organic compound made from an inorganic compound was urea, not acetone.

Question 104 Ionisation energy along a period

The ionization energy increases along a period in periodic table due to increase in:

- A. No. of positron
- B. No. of neutron

lear charge ✓ **Correct answer**

- D. No. of electron
- E. Atomic size

A. wrong: ionisation energy increases along a period due to increasing nuclear charge.

B. wrong: ionisation energy increases along a period due to increasing nuclear charge.

C. correct: ionisation energy increases along a period because the nuclear charge increases (electrons are held more tightly).

D. wrong: ionisation energy increases along a period due to increasing nuclear charge.

E. wrong: atomic size decreases along a period; ionisation energy increases due to increasing nuclear charge.

Question 105 Same ΔH, one step or several

Reaction taking place in one stop or in several stops have same ΔH, it is statement of:

- A. Lussac's law of combining volume
- B. Hess's law ✓ **Correct answer**
- C. Boyle's law
- D. Charle's law
- E. Avogadro's law

A. wrong: the statement that ΔH is the same whether a reaction takes place in one step or several is Hess's law.

B. correct: Hess's law states that the enthalpy change is the same whether a reaction takes place in one step or in several steps.

C. wrong: Boyle's law relates pressure and volume of a gas, not enthalpy.

D. wrong: Charles's law relates volume and temperature of a gas, not enthalpy.

ogadro's law relates volume and moles of a gas, not enthalpy.

Question 106 Oxidation of primary alcohol

Oxidation of primary alcohol gives:

- A. Aldehyde ✓ **Correct answer**
- B. Ketone
- C. Alkane
- D. Alkene
- E. Alkaloids

A. correct: oxidation of a primary alcohol gives an aldehyde (and then a carboxylic acid on further oxidation).

B. wrong: oxidation of a secondary alcohol gives a ketone, not a primary alcohol.

C. wrong: oxidation of a primary alcohol gives an aldehyde, not an alkane.

D. wrong: dehydration of an alcohol gives an alkene, not oxidation.

E. wrong: oxidation of a primary alcohol gives an aldehyde, not alkaloids.

Question 107 Primary alcohol + halogen acid

Primary alcohol when react with a halogen acid, the product is:

- A. Secondary alcohol
- B. Tertiary alcohol
- C. Primary alcohol
- D. Primary alkyl halide ✓ **Correct answer**
- E. Secondary alkyl halide

A. wrong: a primary alcohol with a halogen acid gives a primary alkyl halide, not a secondary alcohol.

primary alcohol with a halogen acid gives a primary alkyl halide, not a tertiary alcohol.

C. wrong: a primary alcohol with a halogen acid gives a primary alkyl halide.

D. correct: a primary alcohol reacts with a halogen acid to give a primary alkyl halide.

E. wrong: a primary alcohol with a halogen acid gives a primary alkyl halide, not a secondary one.

Question 108 Acetophenone is an

Acetophenone is an:

- A. Aliphatic ketones
- B. Phenol
- C. Carboxylic acid
- D. Aldehyde
- E. Aromatic ketones ✓ **Correct answer**

A. wrong: acetophenone is an aromatic ketone, not an aliphatic ketone.

B. wrong: acetophenone is a ketone, not a phenol.

C. wrong: acetophenone is a ketone, not a carboxylic acid.

D. wrong: acetophenone is a ketone, not an aldehyde.

E. correct: acetophenone ($C_6H_5COCH_3$) is an aromatic ketone.

Question 109 SN1 mechanism

SN1 mechanism is a:

- A. Formation of carbocation is fast step
- B. Single step mechanism
- C. Two step mechanism ✓ **Correct answer**

- ack of nucleophile an carbocation is slow step
- E. Primary alkyl halide follows Sul mechanism

A. wrong: in SN1 the formation of the carbocation is the slow (rate-determining) step.

B. wrong: SN1 is a two-step mechanism.

C. correct: the SN1 mechanism is a two-step mechanism (carbocation formation, then attack by the nucleophile).

D. wrong: the attack of the nucleophile on the carbocation is the fast step in SN1.

E. wrong: primary alkyl halides follow the SN2 mechanism, not SN1.

Question 110 Hexanoic acid common name

Hexanoic acid is IUPAC name:

- A. Adipic acid
- B. Propionic acid
- C. Formic acid
- D. Caproic acid ✓ **Correct answer**
- E. Butyric acid

A. wrong: adipic acid is hexanedioic acid, not hexanoic acid.

B. wrong: propionic acid is propanoic acid, not hexanoic acid.

C. wrong: formic acid is methanoic acid, not hexanoic acid.

D. correct: hexanoic acid is commonly known as caproic acid.

E. wrong: butyric acid is butanoic acid, not hexanoic acid.

Question 111 Properties of γ-rays

The option having all the properties of γ-rays:

- ...tron highly penetrating, velocity is equal to that of light. Remain un deflected in magnetic filed
- B. Most penetrating, velocity is equal to that of light no deflection in magnetic field, short wave length, shorter than x-rays ✓ **Correct answer**
- C. Least penetrating, velocity of light deflects in magnetic field helium nucleus
- D. Proton least penetrating, deflects like negative particle in magnetic field
- E. Most penetrating power, velocity less than that light of deflects in magnetic filed they are electron

A. wrong: this describes neutrons, not γ-rays.

B. correct: γ-rays are the most penetrating, travel at the speed of light, are not deflected in a magnetic field, and have a shorter wavelength than X-rays.

C. wrong: this describes α-particles (helium nuclei), not γ-rays.

D. wrong: this describes protons/β-particles, not γ-rays.

E. wrong: this describes β-particles (electrons), not γ-rays.

Question 112 Solubility product Ksp predicts

The solubility product Ksp predicts whether:

- A. Diffusion
- B. Solubility
- C. Precipitation will take place or not ✓ **Correct answer**
- D. Boiling point
- E. Melting point

A. wrong: Ksp predicts whether precipitation will take place, not diffusion.

B. wrong: Ksp predicts whether precipitation will take place, not solubility in general.

C. correct: the solubility product Ksp predicts whether precipitation will take place or not.

p predicts whether precipitation will take place, not boiling point.

E. wrong: Ksp predicts whether precipitation will take place, not melting point.

Question 113 Amino acids linked in protein by

In protein, amino acid molecules are linked by:

- A. Glucosidic linkage
- B. Glycosidic linkage
- C. Peptide linkage ✓ **Correct answer**
- D. Ethane linkage
- E. Ester linkage

A. wrong: amino acids in a protein are linked by peptide linkages, not glucosidic linkages.

B. wrong: amino acids in a protein are linked by peptide linkages, not glycosidic linkages.

C. correct: in a protein, amino acid molecules are linked by peptide linkages.

D. wrong: there is no 'ethane linkage' joining amino acids.

E. wrong: amino acids in a protein are linked by peptide linkages, not ester linkages.

Question 114 Atomic mass ratio H : C

Ratio of atomic mass of hydrogen to atomic mass of C is:

- A. One xixth
- B. One twelfth ✓ **Correct answer**
- C. Half
- D. Double
- E. Equal

A. wrong: the atomic mass of hydrogen to carbon is 1:12, i.e. one twelfth.

B. correct: the atomic mass of hydrogen (1) to carbon (12) is in the ratio 1:12, i.e. one

C. wrong: the ratio is one twelfth, not half.

D. wrong: the ratio is one twelfth, not double.

E. wrong: the ratio is one twelfth, not equal.

Question 115 Reforming

Reforming:

- A. Increases knocking of internal combustion engine
- B. Increases octane number ✓ **Correct answer**
- C. More is the knocking, better is the fuel
- D. To produce a fuel of less octane number
- E. Decreases octane number

A. wrong: reforming increases the octane number, which reduces knocking.

B. correct: reforming increases the octane number of petrol (improving its quality).

C. wrong: less knocking means a better fuel.

D. wrong: reforming produces a fuel of higher octane number.

E. wrong: reforming increases the octane number, it does not decrease it.

Question 116 Formaldehyde + ethyl alcohol addition product

Addition product of formaldehyde & ethyl alcohol is:

- A. Aldehyde
- B. Acetal ✓ **Correct answer**
- C. Carboxylic acid
- D. Acctone
- E. Ketone

e addition product of formaldehyde and ethyl alcohol is an acetal, not an aldehyde.

B. correct: formaldehyde reacts with ethyl alcohol to give an acetal.

C. wrong: the addition product is an acetal, not a carboxylic acid.

D. wrong: the addition product is an acetal, not acetone.

E. wrong: the addition product is an acetal, not a ketone.

Question 117 Down's cell

Down cell is for the:

- A. Metallurgy of Na ✓ **Correct answer**
- B. Metallurgy of Mg
- C. Metallurgy of Al
- D. Metallurgy of Fe
- E. Metallurgy of Ca

A. correct: the Down's cell is used for the metallurgy (extraction) of sodium by electrolysis of molten NaCl.

B. wrong: the Down's cell is for sodium, not magnesium.

C. wrong: the Down's cell is for sodium, not aluminium.

D. wrong: the Down's cell is for sodium, not iron.

E. wrong: the Down's cell is for sodium, not calcium.

Question 118 Falling drop spherical due to

Falling drop of liquid is spherical due to its:

- A. Evaporation on exposure

face tension ✓ **Correct answer**

- C. Atomic structure
- D. Viscosity
- E. Vapor pressure

A. wrong: a falling drop is spherical due to surface tension, not evaporation.

B. correct: a falling drop of liquid is spherical due to surface tension (which minimises surface area).

C. wrong: a falling drop is spherical due to surface tension, not atomic structure.

D. wrong: a falling drop is spherical due to surface tension, not viscosity.

E. wrong: a falling drop is spherical due to surface tension, not vapour pressure.

Question 119 Catalytic hydrogenation of oil gives

Catalytic hydrogenation of oil gives:

- A. Alkene
- B. Alkyne
- C. Soap
- D. Alkyl halides
- E. Fat ✓ **Correct answer**

A. wrong: catalytic hydrogenation of oil gives fat, not an alkene.

B. wrong: catalytic hydrogenation of oil gives fat, not an alkyne.

C. wrong: soap is made by saponification of fat, not by hydrogenation of oil.

D. wrong: catalytic hydrogenation of oil gives fat, not alkyl halides.

E. correct: catalytic hydrogenation of oil (unsaturated) gives fat (saturated, e.g. vanaspati ghee).

120 Benzyl alcohol is a

Benzyl alcohol $C6H5CH_2OH$ is a:

- A. Aromatic alcohol ✓ **Correct answer**
- B. Phenol
- C. Aromatic ketone
- D. Aliphatic alcohol
- E. Alicyclic alcohol

A. correct: benzyl alcohol ($C_6H_5CH_2OH$) is an aromatic alcohol.

B. wrong: benzyl alcohol is an alcohol, not a phenol (the –OH is not directly on the ring).

C. wrong: benzyl alcohol is an alcohol, not a ketone.

D. wrong: benzyl alcohol is an aromatic alcohol, not an aliphatic alcohol.

E. wrong: benzyl alcohol is an aromatic alcohol, not an alicyclic alcohol.

Question 121 Ammonia–Solvay process manufactures

Ammonia Solvay process is an industry for manufacture of:

- A. HNO3
- B. HCL
- C. Soda Ash (Na2CO3) ✓ **Correct answer**
- D. H_2SO4
- E. CaCO3

A. wrong: the Solvay process manufactures soda ash, not nitric acid.

B. wrong: the Solvay process manufactures soda ash, not hydrochloric acid.

C. correct: the ammonia–Solvay process is the industry for the manufacture of soda ash (Na_2CO_3).

e Solvay process manufactures soda ash, not sulphuric acid.

E. wrong: calcium carbonate is a raw material of the Solvay process, not its product.

Question 122 Orbitals allowed in M shell

The quantum number allows the following orbitals in M shell:

- A. s - orbital
- B. s, p, d & f orbital
- C. s & p orbital
- D. All options correct
- E. s, p & d orbitals ✓ **Correct answer**

A. wrong: the M shell (n = 3) allows s, p and d orbitals, not s alone.

B. wrong: the M shell allows s, p and d orbitals — f orbitals first appear in the N shell.

C. wrong: the M shell allows s, p and d orbitals, not just s and p.

D. wrong: not all options are correct — the M shell allows s, p and d orbitals.

E. correct: the M shell (n = 3) allows s, p and d orbitals.

Question 123 Different resistors across a battery

When different resistors are connected across the terminal of a battery:

- A. both emf and terminal potential difference gradually change
- B. both emf and terminal potential difference change
- C. its emf changes but terminal potential difference remain same
- D. both emf and terminal potential difference remain same
- E. its emf remain the same but terminal potential difference changes ✓ **Correct answer**

A. wrong: the emf of the battery remains the same; only the terminal potential difference

B. wrong: the emf remains the same; only the terminal potential difference changes.

C. wrong: the emf remains the same and the terminal potential difference changes.

D. wrong: the terminal potential difference changes when different resistors are connected.

E. correct: the emf of the battery remains the same, but the terminal potential difference changes with the external resistance ($V = E - Ir$).

Question 124 Minimum photon energy for pair production

The minimum energy of photon for pair production is:

- A. 1023
- B. 1026V
- C. 102MeV ✓ **Correct answer**
- D. 102Gev
- E. 102keV

A. wrong: the minimum photon energy for pair production is 1.02 MeV (option C as printed, '102MeV'), not 1023.

B. wrong: the minimum photon energy for pair production is 1.02 MeV, not 1026V.

C. correct: pair production needs at least the rest energy of an electron and a positron, 2×0.51 MeV = 1.02 MeV (printed '102MeV' — the paper's typesetting dropped the decimal point).

D. wrong: the minimum photon energy for pair production is 1.02 MeV, not 102 GeV.

E. wrong: the minimum photon energy for pair production is 1.02 MeV, not 102 keV. (Note: the paper prints the values without decimal points — '1023', '1026V', '102MeV', '102Gev', '102keV' — the intended values are 1.02 eV, 1.02 eV, 1.02 MeV, 1.02 GeV and 1.02 keV.)

125 Faraday's law equation

The mathematical equation representing Faraday's law is:

- A. $E = N\Delta I/\Delta t$
- B. $E = -N\Delta\Phi/\Delta t$ ✓ **Correct answer**
- C. $E = N\Delta I/\Delta t$
- D. $E = -\Delta\Phi/\Delta t$
- E. $E = -(\Delta\Phi)\Delta I$

A. wrong: Faraday's law involves the change in magnetic flux, not the change in current.

B. correct: by Faraday's law, the induced emf is $E = -N\Delta\Phi/\Delta t$ (the negative sign is Lenz's law).

C. wrong: Faraday's law involves the change in magnetic flux, not the change in current (and it lacks the negative sign).

D. wrong: Faraday's law includes the number of turns N — $E = -N\Delta\Phi/\Delta t$.

E. wrong: Faraday's law is $E = -N\Delta\Phi/\Delta t$, not $-(\Delta\Phi)\Delta I$.

Question 126 Cyclist skids on circular track

A cyclist moving on a circular track skids because:

- A. The limiting friction is perpendicular to the centripetal force
- B. The limiting friction is greater than the required centripetal force
- C. The limiting friction is opposite to the centripetal force
- D. The limiting friction is equal to the required centripetal force
- E. The limiting friction is less than the required centripetal force ✓ **Correct answer**

A. wrong: the cyclist skids because the limiting friction is less than the required centripetal force.

B. wrong: if the limiting friction were greater, the cyclist would not skid.

e cyclist skids because the limiting friction is less than the required centripetal force.

D. wrong: if they were equal, the cyclist would just manage the turn, not skid.

E. correct: a cyclist skids because the limiting friction is less than the centripetal force required for the turn.

Question 127 Body dropped, velocity after 5 seconds

A body is dropped from certain height and falls freely, its velocity after 5 seconds will be:

- A. 94m/s
- B. 9.4m/s
- C. 0.49m/s
- D. 4.9m/s
- E. 49m/s ✓ **Correct answer**

A. wrong: v = gt = 9.8 × 5 = 49 m/s, not 94 m/s.

B. wrong: v = gt = 9.8 × 5 = 49 m/s, not 9.4 m/s.

C. wrong: v = gt = 9.8 × 5 = 49 m/s, not 0.49 m/s.

D. wrong: v = gt = 9.8 × 5 = 49 m/s, not 4.9 m/s.

E. correct: for a freely falling body, v = gt = 9.8 × 5 = 49 m/s.

Question 128 Two waves differ in

Two transverse travelling waves are presented by these equations. y1 = Ao Sin (kx – wt) and y2 = Ao Sin (kx – wt - ∅). These two waves differ in:

- A. Amplitude
- B. Frequency
- C. Wavelength

se ✓ Correct answer

- E. Direction of propagation

A. wrong: both waves have the same amplitude A_0.

B. wrong: both waves have the same angular frequency ω.

C. wrong: both waves have the same wave number k, hence the same wavelength.

D. correct: the two waves $y_1 = A_0 \sin(kx - \omega t)$ and $y_2 = A_0 \sin(kx - \omega t - \varnothing)$ differ only in phase (by ∅).

E. wrong: both waves travel in the same direction.

Question 129 E = −ΔV/Δr, negative sign

In equations E = −ΔV/Δr, Negative sign indicates that:

- A. 'E' points towards increasing 'V'
- B. 'E' points towards decreasing 'V' ✓ **Correct answer**
- C. 'E' is perpendicular to 'V'
- D. 'E' is parallel to ΔV
- E. 'E' is opposite to ΔV

A. wrong: the negative sign means E points towards decreasing V.

B. correct: in E = −ΔV/Δr, the negative sign indicates that the electric field points towards decreasing potential.

C. wrong: the negative sign indicates the direction of E relative to V, not perpendicularity.

D. wrong: the negative sign indicates that E points towards decreasing V.

E. wrong: the negative sign indicates that E points towards decreasing V — the keyed answer is B.

130 Path of neutron perpendicular to magnetic field

The path of a neutron moving perpendicular to magnetic field is:

- A. Curve
- B. Straight line ✓ **Correct answer**
- C. Circle
- D. Ellipse
- E. Parabola

A. wrong: a neutron is uncharged, so the magnetic field exerts no force on it.

B. correct: a neutron carries no charge, so it experiences no magnetic force and moves in a straight line.

C. wrong: a charged particle moves in a circle, but a neutron is uncharged.

D. wrong: a neutron is uncharged and moves in a straight line.

E. wrong: a neutron is uncharged and moves in a straight line.

Question 131 Terminal potential of battery

A battery of emf ‘E’ has an internal resistance Y. If current ‘I’ is drawn then terminal potential ‘V1’ is given by:

- A. V1 = E + Ir
- B. V1 = E - Ir ✓ **Correct answer**
- C. V1 = E/(I−r)
- D. V1 = Er
- E. V1 = E/(I+r)

A. wrong: the terminal potential is $V_1 = E - Ir$, not E + Ir.

B. correct: when current I is drawn, the terminal potential is $V_1 = E - Ir$ (emf minus the drop across the internal resistance).

e terminal potential is $V_1 = E - Ir$.

D. wrong: the terminal potential is $V_1 = E - Ir$.

E. wrong: the terminal potential is $V_1 = E - Ir$.

Question 132 Instantaneous emf of AC generator

The instantaneous emf generated by alternating current generator is written as:

- A. $E = BINA\sin\omega t$
- B. $E = BNA\cos\sin\omega t$ ✓ **Correct answer**
- C. $E = BINA$
- D. $E = E_0/BINA$
- E. $E = BNA\omega$

A. wrong: the instantaneous emf is $E = BNA\omega \cos \omega t$ (option B as printed) — option A has an extra 'I' and lacks the ω factor.

B. correct: the instantaneous emf generated by an alternating current generator is $E = BNA\omega \cos \omega t$ (printed 'BNAcosinωt' in the paper — a typesetting error for 'BNAωcosωt').

C. wrong: the instantaneous emf varies with time; $E = BINA$ is not the instantaneous emf.

D. wrong: the instantaneous emf is $E = BNA\omega \cos \omega t$, not $E_0/BINA$.

E. wrong: $BNA\omega$ is the peak emf, not the instantaneous emf.

Question 133 Bullet fired horizontally, velocity after 2 s

A bullet is fired horizontally with 20m/s. In the absence of air friction, its horizontal velocity after 2 second will be:

- A. 10 m/s
- B. 05 m/s
- C. 60 m/s

m/s

- E. 20 m/s ✓ **Correct answer**

A. wrong: with no air friction, the horizontal velocity stays 20 m/s.

B. wrong: with no air friction, the horizontal velocity stays 20 m/s.

C. wrong: with no air friction, the horizontal velocity stays 20 m/s.

D. wrong: with no air friction, the horizontal velocity stays 20 m/s.

E. correct: in the absence of air friction there is no horizontal force, so the horizontal velocity remains 20 m/s after 2 seconds.

Question 134 First Lyman line wavelength

If Rydberg constant for hydrogen is RH then wave length ‘λ’ of first line in Lyman series is:

- A. 4R_H/3
- B. R_H/4
- C. 4/R_H
- D. 4/(3R_H) ✓ **Correct answer**
- E. R_H/2

A. wrong: the first Lyman line has $\lambda = 4/(3R_H)$, not 4R_H/3.

B. wrong: the first Lyman line has $\lambda = 4/(3R_H)$, not R_H/4.

C. wrong: the first Lyman line has $\lambda = 4/(3R_H)$, not 4/R_H.

D. correct: for the first Lyman line, $1/\lambda = R_H(1 - 1/4) = 3R_H/4$, so $\lambda = 4/(3R_H)$.

E. wrong: the first Lyman line has $\lambda = 4/(3R_H)$, not R_H/2.

135 Cp/Cv ratio

The ratio of molar specific heat of a gas at constant pressure to its molar specific heat at constant volume is:

- A. Equal to minus one
- B. Equal to zero
- C. Greater than one ✓ **Correct answer**
- D. Less than one
- E. Equal to one

A. wrong: Cp/Cv is greater than one.

B. wrong: Cp/Cv is greater than one.

C. correct: Cp > Cv (Cp includes expansion work), so Cp/Cv is greater than one.

D. wrong: Cp/Cv is greater than one.

E. wrong: Cp/Cv is greater than one.

Question 136 Mass and speed doubled, kinetic energy

If mass and speed of a moving object is doubled, the kinetic energy will be:

- A. Eight times ✓ **Correct answer**
- B. Four times
- C. Doubled
- D. Sixteen times
- E. Six times

A. correct: K.E. = $\frac{1}{2}mv^2$ — doubling m and doubling v gives $2 \times (2)^2 = 8$ times the kinetic energy.

B. wrong: doubling both mass and speed gives eight times the kinetic energy, not four.

C. wrong: doubling both mass and speed gives eight times the kinetic energy.

doubling both mass and speed gives eight times the kinetic energy.

E. wrong: doubling both mass and speed gives eight times the kinetic energy.

Question 137 Electric field between parallel plates

The electric field intensity between two uniformly, oppositely charged parellel plates is: σ

- A. $\sigma/(2\varepsilon_0)$
- B. ε_0/σ
- C. $2\sigma/\varepsilon_0$
- D. σ/ε_0 ✓ **Correct answer**
- E. $\varepsilon_0/(2\sigma)$

A. wrong: $\sigma/(2\varepsilon_0)$ is the field of a single plate; between two oppositely charged plates it is σ/ε_0.

B. wrong: the field between the plates is σ/ε_0, not ε_0/σ.

C. wrong: the field between the plates is σ/ε_0, not $2\sigma/\varepsilon_0$.

D. correct: the electric field intensity between two uniformly, oppositely charged parallel plates is σ/ε_0.

E. wrong: the field between the plates is σ/ε_0.

Question 138 Box explodes, second piece velocity

A box of mass m = 6kg slides with speed v = 4m/s across a frictionless floor, it suddenly explodes into two pieces. One piece, with mass m1 = 2 kg moves in the same direction with speed v1 = 8 m/s, the velocity of the second piece is:

- A. 6 m/sec
- B. 3 m/sec
- C. 1 m/sec
- D. 2 m/sec

/sec ✓ Correct answer

A. wrong: by momentum conservation the second piece moves at 2 m/s.

B. wrong: by momentum conservation the second piece moves at 2 m/s.

C. wrong: by momentum conservation the second piece moves at 2 m/s.

D. correct: initial momentum 6 × 4 = 24 kg·m/s; the 2 kg piece takes 2 × 8 = 16, so the 4 kg piece has 24 − 16 = 8, giving v = 8/4 = 2 m/s.

E. wrong: by momentum conservation the second piece moves at 2 m/s.

Question 139 Faintest audible intensity level

The intensity level (sound level) of faintest audible intensity:

- A. 160 decibel
- B. Zero decibel ✓ **Correct answer**
- C. 140 decibel
- D. 120 decibel
- E. 60 decibel

A. wrong: the faintest audible intensity is 0 decibel.

B. correct: the intensity level of the faintest audible sound is 0 decibel.

C. wrong: the faintest audible intensity is 0 decibel.

D. wrong: the faintest audible intensity is 0 decibel.

E. wrong: the faintest audible intensity is 0 decibel.

Question 140 2 µF and 4 µF in series

If 2µF and 4µF capacitors are connected in series. Their equivalent capacitance will be:

- B. 0.75 µF
- C. 1.33 µF ✓ **Correct answer**
- D. 6 µF
- E. 2 µF

A. wrong: for capacitors in series, 1/C = 1/2 + 1/4 = 3/4, so C = 1.33 µF.

B. wrong: the equivalent capacitance is 1.33 µF, not 0.75 µF.

C. correct: 1/C = 1/2 + 1/4 = 3/4, so C = 4/3 = 1.33 µF.

D. wrong: 6 µF is the sum (parallel combination), not the series equivalent.

E. wrong: the equivalent capacitance is 1.33 µF, not 2 µF.

Question 141 Experimental proof of particle nature of light

The experimental proof of particle nature of light is:

- A. Pair - production
- B. Photo electric effect ✓ **Correct answer**
- C. Davison Germer experiment
- D. de - Broglie concept
- E. Compton's effect

A. wrong: pair production is a consequence of the particle nature, but the textbook proof is the photoelectric effect.

B. correct: the photoelectric effect is the experimental proof of the particle nature of light.

C. wrong: the Davisson–Germer experiment proved the wave nature of electrons, not the particle nature of light.

D. wrong: the de Broglie concept is about the wave nature of matter, not the particle nature of light.

e Compton effect also supports the particle nature, but the textbook answer here is the photoelectric effect.

Question 142 Electrical energy dissipated as heat

The electrical energy dissipated as heat in a resistor is:

- A. V R
- B. V2Rt
- C. I2R
- D. I2Rt ✓ **Correct answer**
- E. IR

A. wrong: the energy dissipated as heat is I^2Rt, not VR.

B. wrong: the energy dissipated as heat is I^2Rt (V^2t/R), not V^2Rt.

C. wrong: I^2R is the power dissipated, not the energy — energy is I^2Rt.

D. correct: the electrical energy dissipated as heat in a resistor is I^2Rt.

E. wrong: IR is the potential drop, not the energy dissipated.

Question 143 One kilowatt hour

One kilowatt hour is equal to:

- A. 36×10^6J
- B. 36×10^{-6}J
- C. 3.6×10^5J
- D. 36×10^{-5}J
- E. 36×10^5J ✓ **Correct answer**

A. wrong: 1 kWh = 3.6×10^6 J, not 36×10^6 J.

B. wrong: 1 kWh = 3.6×10^6 J.

kWh = 3.6×10^6 J, not 3.6×10^5 J.

D. wrong: 1 kWh = 3.6×10^6 J.

E. correct: 1 kWh = 1000 W × 3600 s = 3.6×10^6 J = 36×10^5 J.

Question 144 Joule per coulomb

Unit, joule per coulombs is equal to:

- A. Volt ✓ **Correct answer**
- B. Ampere
- C. henry
- D. Tesla
- E. Newton

A. correct: one joule per coulomb is one volt (potential difference).

B. wrong: an ampere is a coulomb per second, not a joule per coulomb.

C. wrong: a henry is the unit of inductance, not joule per coulomb.

D. wrong: a tesla is the unit of magnetic flux density, not joule per coulomb.

E. wrong: a newton is the unit of force, not joule per coulomb.

Question 145 Rate of disintegration proportional to

According to the law of radioactive decay, the rate of disintegration is directly proportional to:

- A. Pressure
- B. Density of substance
- C. Volume of substance
- D. Number of atoms present ✓ **Correct answer**
- E. Temperature

e rate of disintegration is proportional to the number of atoms present, not pressure.

B. wrong: the rate of disintegration is proportional to the number of atoms present, not density.

C. wrong: the rate of disintegration is proportional to the number of atoms present, not volume.

D. correct: by the law of radioactive decay, the rate of disintegration is directly proportional to the number of atoms present ($dN/dt = -\lambda N$).

E. wrong: the rate of disintegration is proportional to the number of atoms present, not temperature.

Question 146 Eddy current loss reduced by

The Eddy current loss in a transformer can be reduced by:

- A. Using thick copper core
- B. Using thick non magnetic core
- C. Using iron core
- D. Using laminated iron core ✓ **Correct answer**
- E. Using non conducting cre

A. wrong: a thick copper core would increase eddy currents, not reduce them.

B. wrong: eddy current loss is reduced by a laminated iron core.

C. wrong: a solid iron core has large eddy currents; lamination is needed.

D. correct: the eddy current loss in a transformer is reduced by using a laminated iron core.

E. wrong: the eddy current loss is reduced by a laminated iron core (the paper's option E is truncated, 'non conducting core').

147 Absolute gravitational potential energy

The absolute gravitational potential energy "U" of an object of mass 'm' on earth's surface is given by:

- A. $U = -GmM_E/R_E$ ✓ **Correct answer**
- B. $U = GmM_E/R_E$
- C. $U = GmM_E/R_E^2$
- D. $U = GM_E/R_E^2$
- E. $U = -GM_E/R_E^2$

A. correct: the absolute gravitational potential energy of an object of mass m on the Earth's surface is $U = -GmM_E/R_E$ (zero at infinity).

B. wrong: the potential energy is negative ($U = -GmM_E/R_E$), not positive.

C. wrong: the potential energy is $-GmM_E/R_E$, not GmM_E/R_E^2.

D. wrong: the potential energy is $-GmM_E/R_E$, and the object's mass m is missing here.

E. wrong: the potential energy is $-GmM_E/R_E$, and the object's mass m is missing here.

Question 148 Speed of photon in free space

The speed of a photon in free space is:

- A. $1/\sqrt{(\mu_0\varepsilon_0)}$ ✓ **Correct answer**
- B. $(1/2)\mu_0\varepsilon_0$
- C. $1/(\mu_0\varepsilon_0)$
- D. $\sqrt{(\mu_0\varepsilon_0)}$
- E. $\mu_0\varepsilon_0$

A. correct: the speed of light (photon) in free space is $c = 1/\sqrt{(\mu_0\varepsilon_0)}$.

B. wrong: the speed of a photon is $1/\sqrt{(\mu_0\varepsilon_0)}$, not $(1/2)\mu_0\varepsilon_0$.

C. wrong: the speed of a photon is $1/\sqrt{(\mu_0\varepsilon_0)}$, not $1/(\mu_0\varepsilon_0)$.

E. wrong: the speed of a photon is $1/\sqrt{(\mu_0\varepsilon_0)}$, not $\mu_0\varepsilon_0$.

Question 149 Charge moving parallel to magnetic field

A charge 'q' is moving with velocity ''v'', parallel to a magnetic field B. The magnetic force (F) on charge ''q'' is

- A. F = qvB sinθ
- B. F = qvB
- C. F = -qvB
- D. F = 0 qB ✓ **Correct answer**
- E. F = v

A. wrong: the force is qvB sin θ, and with θ = 0° (parallel) sin θ = 0, so F = 0.

B. wrong: the force is qvB sin θ, and with θ = 0° the force is zero.

C. wrong: the force is zero when the charge moves parallel to the field.

D. correct: the magnetic force is F = qvB sin θ; moving parallel to B means θ = 0°, so F = 0.

E. wrong: the force is zero when the charge moves parallel to the field.

Question 150 Current through 10Ω resistor

Resistors of 5Ω and 10Ω are connected parallel. If the potential difference across the 5Ω resister is 20 volts then the current through 10Ω will be:

- A. 0.5 ampere
- B. 20 ampere
- C. 4 ampere
- D. 10 ampere
- E. 2 ampere ✓ **Correct answer**

e potential difference across the 10Ω resistor is 20 V, so I = 20/10 = 2 A.

B. wrong: the current through the 10Ω resistor is 2 A, not 20 A.

C. wrong: the current through the 10Ω resistor is 2 A, not 4 A.

D. wrong: the current through the 10Ω resistor is 2 A, not 10 A.

E. correct: in parallel the potential difference is the same (20 V) across both resistors, so I = V/R = 20/10 = 2 A through the 10Ω resistor.

Question 151 Helicopter ascending, zero acceleration

A helicopter of weight "W" ascending with zero acceleration. The upwar force "F" on it is:

- A. F > W
- B. F = $\sqrt{w}$
- C. F = O
- D. F = W ✓ **Correct answer**
- E. F < W

A. wrong: with zero acceleration the upward force equals the weight, not more.

B. wrong: with zero acceleration the upward force equals the weight, F = W.

C. wrong: with zero acceleration the upward force equals the weight, not zero.

D. correct: ascending with zero acceleration means the net force is zero, so the upward force F equals the weight W.

E. wrong: with zero acceleration the upward force equals the weight, not less.

Question 152 Sound wave changes medium, unchanged characteristic

A sound wave travels from one medium be another, which one of the characteristic of

in unchanged?

- A. Amplitude
- B. Velocity
- C. Pitch ✓ **Correct answer**
- D. Quality
- E. Wavelength

A. wrong: the amplitude can change when a sound wave enters a new medium.

B. wrong: the velocity of sound changes with the medium.

C. correct: the pitch (frequency) of a sound wave remains unchanged when it travels from one medium to another.

D. wrong: the quality (timbre) can change when a sound wave enters a new medium.

E. wrong: the wavelength changes because the velocity changes while the frequency stays the same.

Question 153 Efficient long-distance electricity transfer

For efficient transfer of electricity through cables over the long distance:

- A. Both the current and voltage must be low
- B. The current must be low and voltage high ✓ **Correct answer**
- C. Both the current and voltage must be high
- D. The voltage must be zero and current low
- E. The voltage must low and current high

A. wrong: efficient transfer needs low current and high voltage.

B. correct: for efficient transfer over long distances the current must be low (to reduce I^2R losses) and the voltage high.

C. wrong: a high current causes large I^2R losses.

e voltage must be high, not zero.

E. wrong: the current must be low and the voltage high, not the other way round.

Question 154 Body moving with uniform velocity

When a body moves with uniform velocity then its:

- A. Average velocity is zero
- B. Instantaneous velocity is greater than average velocity
- C. Instantaneous velocity is zero
- D. Instantaneous velocity is equal to average velocity ✓ **Correct answer**
- E. Instantaneous velocity is less than average velocity

A. wrong: with uniform velocity the average velocity equals the (non-zero) velocity.

B. wrong: with uniform velocity the instantaneous velocity equals the average velocity.

C. wrong: with uniform velocity the instantaneous velocity equals the average velocity, not zero.

D. correct: when a body moves with uniform velocity, its instantaneous velocity is equal to its average velocity.

E. wrong: with uniform velocity the instantaneous velocity equals the average velocity.

Question 155 Every particle of rotating disc

Every particle of a rotating disc moves with:

- A. Constant linear velocity
- B. Constant angular velocity ✓ **Correct answer**
- C. Constant tangential velocity
- D. Constant linear displacement
- E. Constant linear moment

e linear velocity of a particle depends on its distance from the centre, so it is not the same for every particle.

B. correct: every particle of a rotating disc moves with the same (constant) angular velocity.

C. wrong: the tangential velocity depends on the distance from the centre, so it is not the same for every particle.

D. wrong: the linear displacement depends on the distance from the centre.

E. wrong: the linear momentum depends on the distance from the centre.

Question 156 Proton energy through 20 V

A proton of charge 1.6×10^{-19}C is moved through a potential difference of 20 volt. The energy gained by the proton is:

- A. -32×10^{-19}J
- B. 32×10^{-19}J ✓ **Correct answer**
- C. -32×10^{19}J
- D. 32×10^{19}J
- E. Zero

A. wrong: the energy gained is positive, 32×10^{-19} J.

B. correct: $W = qV = 1.6 \times 10^{-19}$ C $\times$ 20 V $= 32 \times 10^{-19}$ J.

C. wrong: the energy gained is 32×10^{-19} J, not -32×10^{19} J.

D. wrong: the energy gained is 32×10^{-19} J, not 32×10^{19} J.

E. wrong: the proton gains 32×10^{-19} J of energy.

157 Distance between consecutive antinodes — official key error corrected

Distance between two consecutive antinodes in standing wave is λ

- A. λ/4
- B. λ
- C. λ/2 ✓ **Correct answer**
- D. 2λ
- E. 3λ/2

A. wrong: λ/4 is the distance between a node and the nearest antinode, not between two antinodes.

B. wrong: consecutive antinodes are λ/2 apart, not λ.

C. correct: in a standing wave, two consecutive antinodes are separated by half a wavelength (λ/2), just as two consecutive nodes are.

D. wrong: consecutive antinodes are λ/2 apart, not 2λ — the official Code-B key lists D, which is wrong.

E. wrong: consecutive antinodes are λ/2 apart, not 3λ/2. (Official-key error: official Code-B key D corrected to C; decided by assistant under owner's 8 Nov 2026 delegation.)

Question 158 Wire cut in two, resistivity

A conducting wire of resistivity " ρ " is cut into two equal parts. The resistivity of each part will be:

- A. The same ✓ **Correct answer**
- B. One fourth
- C. √2 times
- D. Halved
- E. Doubled

resistivity is a property of the material, so cutting the wire does not change it — the resistivity of each part is the same.

B. wrong: resistivity does not change when the wire is cut.

C. wrong: resistivity does not change when the wire is cut.

D. wrong: the resistance halves, but the resistivity stays the same.

E. wrong: resistivity does not change when the wire is cut.

Question 159 Spring cut into three segments

If the given spring of spring constant K is cut into three identical segments the spring constant of each segment is:

- A. 1K
- B. K/2
- C. K/3
- D. 3K ✓ **Correct answer**
- E. 4K

A. wrong: cutting a spring into three identical segments triples the spring constant of each segment (3K).

B. wrong: each segment has a spring constant of 3K, not K/2.

C. wrong: each segment has a spring constant of 3K, not K/3.

D. correct: the spring constant is inversely proportional to length, so each of the three identical segments has a spring constant of 3K.

E. wrong: each segment has a spring constant of 3K, not 4K.

160 Four 3V cells in series

Four cells of emf 3volt are connected in series to form a battery. Net emf of the combination is:

- A. 12volt ✓ **Correct answer**
- B. 1.33volt
- C. 9volt
- D. 7volt
- E. 3volt

A. correct: four cells of 3 V each in series give a net emf of 4 × 3 = 12 V.

B. wrong: the net emf is 12 V, not 1.33 V.

C. wrong: the net emf is 12 V, not 9 V.

D. wrong: the net emf is 12 V, not 7 V.

E. wrong: the net emf is 12 V, not 3 V.

Question 161 Rate of change of linear momentum

The rate of change of linear momentum of a body is equal to:

- A. Net force ✓ **Correct answer**
- B. Net displacement
- C. Net torque
- D. Net inertia
- E. Net velocity

A. correct: by Newton's second law, the rate of change of linear momentum of a body equals the net force acting on it.

B. wrong: the rate of change of momentum equals the net force, not net displacement.

C. wrong: net torque equals the rate of change of angular momentum, not linear

D. wrong: the rate of change of momentum equals the net force, not net inertia.

E. wrong: the rate of change of momentum equals the net force, not net velocity.

Question 162 SHM mathematical expression

The most appropriate mathematical expression representing simple harmonic motion is:

- A. $a \propto x$
- B. $a \propto -x$ ✓ **Correct answer**
- C. $a = x$
- D. $a = kx$
- E. $a = -x$

A. wrong: in SHM the acceleration is proportional to the negative of the displacement.

B. correct: the defining expression of simple harmonic motion is $a \propto -x$ (acceleration is proportional to displacement and opposite in direction).

C. wrong: in SHM $a \propto -x$, not $a = x$.

D. wrong: in SHM $a \propto -x$ (with a negative sign), not $a = kx$.

E. wrong: the expression is $a \propto -x$ (proportionality), not $a = -x$.

Question 163 Centripetal acceleration, r and T

A body is moving in a circle with constant speed, with radius of circle is 'r' and time period 'T' the centripetal acceleration is given by: $4\pi r$ 2

- A. $ac = 4\pi r^2/T^2$
- B. $ac = 4\pi^2 r/T^2$ ✓ **Correct answer**
- C. $ac = 4\pi r/T$
- D. $ac = 4\pi^2 r^2/T$

4πr²/T

A. wrong: the centripetal acceleration is $a_c = 4\pi^2 r/T^2$, not $4\pi r^2/T^2$.

B. correct: $a_c = v^2/r = (2\pi r/T)^2/r = 4\pi^2 r/T^2$.

C. wrong: the centripetal acceleration is $a_c = 4\pi^2 r/T^2$, not $4\pi r/T$.

D. wrong: the centripetal acceleration is $a_c = 4\pi^2 r/T^2$, not $4\pi^2 r^2/T$.

E. wrong: the centripetal acceleration is $a_c = 4\pi^2 r/T^2$, not $4\pi r^2/T$.

Question 164 Kinetic energy of electron in first Bohr orbit

The kinetic energy of an electron in first Bohr radius of H - atom is:

- A. 13.6J
- B. 13.6eV ✓ **Correct answer**
- C. -13.6eV
- D. 13.6keV
- E. 13.6kJ

A. wrong: the kinetic energy is 13.6 eV, not 13.6 J.

B. correct: in the first Bohr orbit of hydrogen the total energy is −13.6 eV, so the kinetic energy is +13.6 eV.

C. wrong: −13.6 eV is the total energy, not the kinetic energy.

D. wrong: the kinetic energy is 13.6 eV, not 13.6 keV.

E. wrong: the kinetic energy is 13.6 eV, not 13.6 kJ.

Question 165 Lenz's law is a form of

Lenz' law is a form of the:

of conservation of momentum

- B. Law of conservation of charge
- C. Law of conservation of angular momentum
- D. Law of conservation of energy ✓ **Correct answer**
- E. Law of conservation of mass

A. wrong: Lenz's law is a form of the law of conservation of energy.

B. wrong: Lenz's law is a form of the law of conservation of energy.

C. wrong: Lenz's law is a form of the law of conservation of energy.

D. correct: Lenz's law (the induced current opposes the change producing it) is a form of the law of conservation of energy.

E. wrong: Lenz's law is a form of the law of conservation of energy.

Question 166 Rate of doing work zero, angle

The rate of doing work is zero, when the angle θ between force and velocity is:

- A. θ = 60°
- B. θ = 180°
- C. θ = 0°
- D. θ = 45°
- E. θ = 90° ✓ **Correct answer**

A. wrong: the rate of doing work (power) is zero when the force is perpendicular to the velocity, i.e. θ = 90°.

B. wrong: at 180° the power is negative (maximum magnitude), not zero.

C. wrong: at 0° the power is maximum positive, not zero.

D. wrong: at 45° the power is non-zero.

power P = Pv cos θ is zero when cos θ = 0, i.e. θ = 90°.

Question 167 Half-life formula

Half-life of a radioactive sample is given by: (0.693)

- A. T1/2 = (0.693)/√λ
- B. T1/2 = √(0.693/λ)
- C. T1/2 = (0.693)λ
- D. T1/2 = √0.693
- E. T1/2 = 0.693/λ ✓ **Correct answer**

A. wrong: the half-life is T½ = 0.693/λ, not (0.693)/√λ.

B. wrong: the half-life is T½ = 0.693/λ, not √(0.693/λ).

C. wrong: the half-life is T½ = 0.693/λ, not (0.693)λ.

D. wrong: the half-life is T½ = 0.693/λ, not √0.693.

E. correct: the half-life of a radioactive sample is T½ = 0.693/λ (ln 2 divided by the decay constant).

Question 168 Two 1 C charges 1 m apart

Two similar point charges, each of 1 coulomb, placed in free space 1m apart. repel each other with a force of:

- A. 8.85 ×10-12N
- B. 1.602×10^{-19}N
- C. 1N
- D. $6{,}67 \times 10^{-11}$N
- E. 9×10^{9} N ✓ **Correct answer**

A. wrong: the force is 9×10^{9} N, not 8.85×10^{-12} N (that is ε_0).

e force is 9×10^{9} N, not 1.602×10^{-19} N (that is the electronic charge).

C. wrong: the force is 9×10^{9} N, not 1 N.

D. wrong: the force is 9×10^{9} N, not 6.67×10^{-11} N (that is G).

E. correct: by Coulomb's law, $F = kq_1q_2/r^2 = 9 \times 10^{9} \times 1 \times 1/1^2 = 9 \times 10^{9}$ N.

Question 169 Nuclear reaction missing particle

In nuclear reaction 7N14 + 2He4 ----> 8O17 + _____, the missing particle is:

- A. Proton ✓ **Correct answer**
- B. alpha - particle
- C. Electron
- D. Position
- E. Neutron

A. correct: $^{14}N + {}^{4}He \rightarrow {}^{17}O + {}^{1}H$ — the missing particle is a proton (Rutherford's first artificial transmutation).

B. wrong: the alpha particle is a reactant, not the missing product.

C. wrong: balancing mass and charge numbers gives a proton, not an electron.

D. wrong: the missing particle is a proton, not a positron.

E. wrong: balancing mass and charge numbers gives a proton, not a neutron.

Question 170 Potential difference to reduce depletion layer

The potential difference applied across a diode to reduce depletion layer is:

- A. Reverse biasing
- B. Forward biasing ✓ **Correct answer**
- C. Biasing voltage
- D. Junction potential

A. wrong: reverse biasing widens the depletion layer, it does not reduce it.

B. correct: forward biasing reduces the depletion layer of a diode.

C. wrong: forward biasing (not just any biasing voltage) reduces the depletion layer.

D. wrong: the junction potential is the barrier potential, not the biasing that reduces the depletion layer.

E. wrong: the potential barrier is what forward biasing reduces, not the biasing itself. (Note: the fifth option is printed in the paper without a letter label; it is read positionally as option E.)

Question 171 Radius of curvature in magnetic field

A charged particle of mass 'm' and charge 'q' is projected in a magnetic field of induction 'B' at an angle 'θ'. The radius of curvature of its curved path is given by:

- A. $r = mv / qB$
- B. $r = mv / qB \sin\theta$
- C. $r = mv \cos\theta / qB$
- D. $r = mv \sin\theta / qB$ ✓ **Correct answer**
- E. $r = mvB / q$

A. wrong: the radius is $r = mv \sin\theta/qB$, not mv/qB.

B. wrong: the radius is $r = mv \sin\theta/qB$, not $mv/(qB \sin\theta)$.

C. wrong: the radius is $r = mv \sin\theta/qB$, not $mv \cos\theta/qB$.

D. correct: a charged particle projected at an angle θ to a magnetic field moves in a helix with radius $r = mv \sin\theta/qB$.

E. wrong: the radius is $r = mv \sin\theta/qB$, not mvB/q.

172 Specific heat capacity units

Specific heat capacity of a gas is measured in:

- A. $J.kg.K^{-1}$
- B. $J.kg^{2}.K$
- C. $J.kg^{-1}.K^{-1}$ ✓ **Correct answer**
- D. $J.kg^{-1}.K$
- E. J.kg.K

A. wrong: specific heat capacity is measured in $J{\cdot}kg^{-1}{\cdot}K^{-1}$, not $J{\cdot}kg{\cdot}K^{-1}$.

B. wrong: specific heat capacity is measured in $J{\cdot}kg^{-1}{\cdot}K^{-1}$.

C. correct: specific heat capacity (heat per unit mass per kelvin) is measured in $J{\cdot}kg^{-1}{\cdot}K^{-1}$.

D. wrong: specific heat capacity is measured in $J{\cdot}kg^{-1}{\cdot}K^{-1}$, not $J{\cdot}kg^{-1}{\cdot}K$.

E. wrong: specific heat capacity is measured in $J{\cdot}kg^{-1}{\cdot}K^{-1}$.

Question 173 First law of thermodynamics

First law of thermodynamics is mathematically represented as:

- A. $\Delta W = \Delta Q + \Delta U$
- B. $\Delta U = \Delta W - \Delta Q$
- C. $\Delta Q = \Delta W - \Delta U$
- D. $\Delta Q = \Delta U - \Delta W$
- E. $\Delta U = \Delta Q - \Delta W$ ✓ **Correct answer**

A. wrong: the first law is $\Delta U = \Delta Q - \Delta W$ (physics sign convention).

B. wrong: the first law is $\Delta U = \Delta Q - \Delta W$.

C. wrong: the first law is $\Delta U = \Delta Q - \Delta W$.

D. wrong: the first law is $\Delta U = \Delta Q - \Delta W$.

e first law of thermodynamics is ΔU = ΔQ − ΔW (change in internal energy = heat supplied minus work done by the system).

Question 174 Angular momentum change, torque

The angular momentum of a particle changes from 0 to 720J.s in 4s. The magnitude of torque is:

- A. 2880 N-m
- B. 180 N-m ✓ **Correct answer**
- C. 360 N-m
- D. 1440 N-m
- E. 90 N-m

A. wrong: torque = ΔL/Δt = 720/4 = 180 N·m, not 2880.

B. correct: torque τ = ΔL/Δt = 720/4 = 180 N·m.

C. wrong: torque = ΔL/Δt = 720/4 = 180 N·m, not 360.

D. wrong: torque = ΔL/Δt = 720/4 = 180 N·m, not 1440.

E. wrong: torque = ΔL/Δt = 720/4 = 180 N·m, not 90.

Question 175 Object faster than speed of sound

An object moving faster than the speed of sound. This object is called:

- A. Sonic
- B. Supersonic ✓ **Correct answer**
- C. Hypersonic
- D. Ultrasonic
- E. Infrasonic

A. wrong: 'sonic' means at the speed of sound, not faster.

an object moving faster than the speed of sound is called supersonic.

C. wrong: 'hypersonic' means much faster than sound (above Mach 5), not merely faster than sound.

D. wrong: 'ultrasonic' refers to sound waves above the audible range, not to an object moving faster than sound.

E. wrong: 'infrasonic' refers to sound below the audible range, not to an object moving faster than sound.

Question 176 Dielectric inserted, capacitance

If a slab of dielectric constant ε = 2 is inserted between, the parallel plates of a charged 20 uF capacitor. Its capacitance will:

- A. Remain the same
- B. Be four times
- C. Be doubled ✓ **Correct answer**
- D. Be halved
- E. Become zero

A. wrong: inserting a dielectric of constant 2 doubles the capacitance.

B. wrong: the capacitance is doubled, not quadrupled.

C. correct: capacitance $C = \kappa\varepsilon_0 A/d$, so with a dielectric constant of 2 the capacitance is doubled (20 μF → 40 μF).

D. wrong: the capacitance is doubled, not halved.

E. wrong: the capacitance is doubled, not zero.

Question 177 Preposition: match ___ school stadium

Fill in with appropriate the Preposition: We saw a cricket match _____ school stadium.

- B. over
- C. of
- D. at ✓ **Correct answer**
- E. on

A. wrong: 'at the school stadium' is the correct preposition here.

B. wrong: 'at the school stadium' is the correct preposition here.

C. wrong: 'at the school stadium' is the correct preposition here.

D. correct: 'We saw a cricket match at the school stadium.'

E. wrong: 'at the school stadium' is the correct preposition here.

Question 178 I ___ an appointment with the dentist soon

I _____ an appointment with the dentist soon.

- A. making
- B. had make
- C. make
- D. made
- E. will make ✓ **Correct answer**

A. wrong: 'I will make an appointment with the dentist soon' is correct.

B. wrong: 'had make' is not correct English.

C. wrong: 'soon' needs the future tense — 'will make'.

D. wrong: 'made' is past tense, but 'soon' refers to the future.

E. correct: 'I will make an appointment with the dentist soon.'

179 Due to his negligence, he failed in the examination

Due to his negligence, he failed in the examination.

- A. he failed
- B. in the examination
- C. his negligence
- D. no error ✓ **Correct answer**
- E. Due to his negligence

A. wrong: there is no error in 'he failed'.

B. wrong: there is no error in 'in the examination'.

C. wrong: there is no error in 'his negligence'.

D. correct: the sentence 'Due to his negligence, he failed in the examination' has no error.

E. wrong: there is no error in 'Due to his negligence'.

Question 180 Capital letters correctly

Which sentence uses capital letters correctly?

- A. I will be moving To china.
- B. I will be moving to China.
- C. I will be Moving to china.
- D. I will be moving to China. ✓ **Correct answer**
- E. I will be moving to china.

A. wrong: 'To' should not be capitalised and 'china' should be 'China'.

B. wrong: the keyed answer is D — option B is printed identically to D in the paper (a print defect: two identical options), and the official key lists D.

C. wrong: 'Moving' should not be capitalised and 'china' should be 'China'.

will be moving to China." uses capitals correctly.

E. wrong: 'china' should be capitalised as 'China'. (Note: options B and D are printed identically in the paper; the official Code-B key lists D.)

Question 181 Articles: climb ___ tree, climb ___ mountain

Fill in with appropriate Article: To climb _____ _ tree in not to climb _____ mountain.

- A. a / a ✓ **Correct answer**
- B. a / an
- C. a / an
- D. the / an
- E. an / a

A. correct: 'To climb a tree is not to climb a mountain.' (Both 'tree' and 'mountain' take 'a'.)

B. wrong: 'mountain' takes 'a', not 'an'.

C. wrong: 'mountain' takes 'a', not 'an' (options B and C are printed identically in the paper).

D. wrong: the sentence takes 'a / a', not 'the / an'.

E. wrong: 'tree' takes 'a', not 'an'. (Note: the stem prints 'in not to climb' for 'is not to climb'; options B and C are printed identically.)

Question 182 Error correction: lived in Barcelona since six years

Error correction: I've lived in Barcelona since six years.

- A. has six years
- B. been six years
- C. at six years
- D. has been six years
- E. for six years ✓ **Correct answer**

e correction is 'for six years', not 'has six years'.

B. wrong: the correction is 'for six years', not 'been six years'.

C. wrong: the correction is 'for six years', not 'at six years'.

D. wrong: the correction is 'for six years', not 'has been six years'.

E. correct: 'I've lived in Barcelona for six years.' — 'since' is used with a point in time, 'for' with a duration. (Note: the paper prints option B as 'been sex years' — a misprint for 'been six years'.)

Question 183 Correct spelling

Spot the correct spelling

- A. Coomitte
- B. Commitee
- C. Committe
- D. Committee ✓ **Correct answer**
- E. Comittee

A. wrong: the correct spelling is 'Committee'.

B. wrong: the correct spelling is 'Committee'.

C. wrong: the correct spelling is 'Committee'.

D. correct: 'Committee' is the correct spelling.

E. wrong: the correct spelling is 'Committee'.

Question 184 To ___, Anne was on time

To _____, Anne was on time for her math class.

- A. everybody's surprise

- C. everybody's surprise ✓ **Correct answer**
- D. every bodys surprise
- E. every-body surprise

A. wrong: the keyed answer is C — option A is printed identically to C in the paper (a print defect: two identical options), and the official key lists C.

B. wrong: the correct phrase is 'everybody's surprise' (possessive).

C. correct: 'To everybody's surprise, Anne was on time for her math class.'

D. wrong: 'every bodys' is not correct English.

E. wrong: 'every-body surprise' is not the correct phrase. (Note: options A and C are printed identically in the paper; the official Code-B key lists C.)

Question 185 Find the error

Find the error.

- A. She showed us five different shades of blue paint
- B. She was approached, but she declined the offer
- C. There are seven floors in this building
- D. This is the best birthday party I have ever had
- E. When I go the museum, I wore comfortable shoes ✓ **Correct answer**

A. wrong: this sentence has no error.

B. wrong: this sentence has no error.

C. wrong: this sentence has no error.

D. wrong: this sentence has no error (the paper prints 'ever hal' — the final 'd' is cut off in print).

e error is in L — the tenses do not match ('go' is present, 'wore' is past); it should be 'When I went to the museum, I wore comfortable shoes.' (Note: option B is printed in the paper with the label 'by' instead of 'b)', and option C has no label — both are read positionally.)

Question 186 Error: Scientist now hope that cloning...

Figure out the error: Scientist now hope that cloning can successfully be conducted in human beings in the near future.

- A. can successfully be conducted in
- B. Scientist now hope that cloning ✓ **Correct answer**
- C. in near future
- D. human beings in near future
- E. No error

A. wrong: there is no error in this part.

B. correct: the error is here — 'Scientist' should be 'Scientists' (plural subject with 'hope').

C. wrong: there is no error in this part.

D. wrong: there is no error in this part.

E. wrong: there is an error — 'Scientist' should be 'Scientists'.

Question 187 Articles: ___ apple ___ day keeps ___ doctor away

Fill in with the appropriate Article: _____ apple _____ day keeps _____ doctor away.

- A. the / a / a
- B. an / a / an
- C. an / the / the
- D. a / a / the
- E. an / a / the ✓ **Correct answer**

e proverb is 'An apple a day keeps the doctor away.'

B. wrong: the proverb ends with 'the doctor', not 'an doctor'.

C. wrong: the proverb is 'An apple a day keeps the doctor away.'

D. wrong: the proverb begins 'An apple', not 'A apple'.

E. correct: 'An apple a day keeps the doctor away.'

Question 188 Preposition: climbed ___ the ladder

Fill in with appropriate the Preposition: She climbed _____ the ladder to paint the wall?

- A. to
- B. up ✓ **Correct answer**
- C. of
- D. on
- E. in

A. wrong: 'climbed up the ladder' is the correct preposition here.

B. correct: 'She climbed up the ladder to paint the wall.'

C. wrong: 'climbed up the ladder' is the correct preposition here.

D. wrong: 'climbed up the ladder' is the correct preposition here.

E. wrong: 'climbed up the ladder' is the correct preposition here.

Question 189 Charles ___ his father ... until school ___

Charles _____ his father in the shop until school _____.

- A. is helping, starts ✓ **Correct answer**
- B. had help, started
- C. helped, was starting

helped, is starting

- E. was helping, will start

A. correct: 'Charles is helping his father in the shop until school starts.'

B. wrong: 'had help' is not correct English here.

C. wrong: 'was starting' does not fit 'until school starts'.

D. wrong: 'is starting' does not fit the sentence.

E. wrong: the tenses do not fit — 'is helping ... starts' is correct.

Question 190 Verb: The teacher ___ completed this chapter

Fill in with a suitable Verb: The teacher _____ completed this chapter.

- A. have
- B. is
- C. are
- D. has ✓ **Correct answer**
- E. they

A. wrong: 'The teacher has completed this chapter' — 'has' agrees with the singular subject.

B. wrong: 'is completed' does not fit the sentence.

C. wrong: 'are' does not agree with the singular subject 'teacher'.

D. correct: 'The teacher has completed this chapter.'

E. wrong: 'they' is a pronoun, not a verb.

Question 191 One must consider about any matter before ___ it

One must consider about any matter before _____ it.

- B. decides
- C. decide
- D. was decide
- E. deciding Read the passage to answer question 192-194: But man is not destined to vanish. He can be killed, but he cannot be destroyed, because his soul is deathless and his spirit is irrepressible. Therefore, though the situation seems dark in the context of the confrontation between the super powers, the silver lining is provide by amazing phenomenon that the very nations which have spent incalculable resources and energy for the production of deadly weapons are desperately trying to find out how they might never be used. They threaten each other, intimidate each other and go to the brink, but before the total hour arrives they withdraw from the brink. ✓ **Correct answer**

A. wrong: after 'before', the gerund 'deciding' is needed.

B. wrong: after 'before', the gerund 'deciding' is needed.

C. wrong: after 'before', the gerund 'deciding' is needed.

D. wrong: after 'before', the gerund 'deciding' is needed.

E. correct: 'One must consider about any matter before deciding it.'

Question 192 Passage title

A suitable tittle for the above passage is:

- A. Cost of living
- B. Man's desire to survive inhibits use of deadly weapons ✓ **Correct answer**
- C. Threats and intimidation between super powers
- D. Destruction of mankind is inevitable
- E. Mounting cost of modern weapons

A. wrong: the passage is about man's survival and the inhibition of deadly weapons not

B. correct: the passage argues that man's deathless soul and irrepressible spirit mean the super powers withdraw from the brink — man's desire to survive inhibits the use of deadly weapons.

C. wrong: threats are mentioned, but the passage's point is survival, not the threats themselves.

D. wrong: the passage argues the opposite — man is not destined to vanish.

E. wrong: the passage is about survival, not the cost of weapons.

Question 193 Passage main point

The main point from the author's view is that:

- A. Man has come here to live
- B. Man's soul and spirit cannot be destroyed by super powers.
- C. Man's destiny is not fully clear or visible
- D. Man's soul and spirit are immortal
- E. Human society will survive despite the serious threat of total annihilation ✓

  Correct answer

A. wrong: the author's main point is that human society will survive despite the threat of annihilation.

B. wrong: this is stated in the passage, but the main point is the survival of human society.

C. wrong: the author's main point is that human society will survive.

D. wrong: this is stated in the passage, but the main point is the survival of human society.

E. correct: the author's main point is that, though the situation seems dark, human society will survive despite the serious threat of total annihilation.

194 Irrepressible meaning

"Irrepressible" in the second line means:

- A. harmful
- B. incompatible
- C. strong
- D. oppressive
- E. unrestrainable ✓ **Correct answer**

A. wrong: 'irrepressible' means unrestrainable, not harmful.

B. wrong: 'irrepressible' means unrestrainable, not incompatible.

C. wrong: 'strong' is close but the precise meaning is unrestrainable.

D. wrong: 'irrepressible' means unrestrainable, not oppressive.

E. correct: 'irrepressible' means unrestrainable — that which cannot be held back or suppressed.

Question 195 Family logic: P, Q, R, S, T

P, Q, R, S and T are five people in the family, if P is the daughter of Q is the son of R, R is the father of S, while T is the daughter of P, then which of the following is true:

- A. R is the uncle of P
- B. R is the grandfather of P ✓ **Correct answer**
- C. P and R are sisters
- D. Q is the daughter of S
- E. P is the sister of T

A. wrong: R is the grandfather of P, not the uncle.

B. correct: Q is the son of R, and P is the daughter of Q, so R is the grandfather of P.

C. wrong: P is R's granddaughter, not his sister.

is the son of R, and nothing says Q is the daughter of S.

E. wrong: T is the daughter of P, not the sister of P.

Question 196 Series 7C 10F 14J 19O

Which would be the next in series? 7C 10F 14J 19O

- A. 23Q
- B. 26N
- C. 27X
- D. 25U ✓ **Correct answer**
- E. 24P

A. wrong: the next term is 25U, not 23Q.

B. wrong: the next term is 25U, not 26N.

C. wrong: the next term is 25U, not 27X.

D. correct: the numbers increase by 3, 4, 5, so the next increase is 6 (19 + 6 = 25); the letters advance by 3, 4, 5 (C→F→J→O), so the next is U (O + 6) — 25U.

E. wrong: the next term is 25U, not 24P.

Question 197 Conclusion: jobs and basic skills

Although most of the lucrative jobs in Pakistan will require a college degree, many of the new jobs require knowledge other than gained in college or university. For workers in those jobs, good basic skills in reading, communication and mathematics play an important role in getting a job & developing a career. From the information given above, what can be validly concluded that in today's economy.

- A. Extra knowledge is an added benefit for career development.
- B. People should train their children for technical work.
- C. Skills in reading, communication & mathematics play an important role in

oping a successful career. ✓ **Correct answer**

- D. All colleges & universities are worthless.
- E. Employment agencies should conduct communication & mathematics classes.

A. wrong: the valid conclusion is that basic skills in reading, communication and mathematics play an important role in developing a successful career.

B. wrong: the passage does not say people should train their children for technical work.

C. correct: the passage states that for workers in the new jobs, good basic skills in reading, communication and mathematics play an important role in getting a job and developing a career.

D. wrong: the passage does not say colleges and universities are worthless.

E. wrong: the passage does not say employment agencies should conduct classes.

Question 198 Deduction: antipollution ordinance

After seven years of suggestion from the environmental department, the Sindh legislation has finally passed an antipollution ordinance. From a reading of the language, the legislation promises to be one of the most effective bills in the history of province. Which of the following can be deducted from the passage?

- A. Pollution is not now a problem in the country.
- B. To reduce pollution, the legislation must now be enforced. ✓ **Correct answer**
- C. The pollution will be reduced in the country.
- D. The pollution problem will be eliminated in the province
- E. The pollution problem will be reduced in the province

A. wrong: the passage implies pollution is a problem (that is why the ordinance was passed).

B. correct: passing the legislation is not enough — to reduce pollution, the legislation must now be enforced.

The passage only says the legislation promises to be effective; reduction is not guaranteed.

D. wrong: the passage does not say the problem will be eliminated.

E. wrong: the passage does not guarantee that the problem will be reduced. (Note: the paper prints option D as 'in the proce' — the final word is cut off in print; it is transcribed as 'province'.)

Question 199 Assumption: management serves, not dominates

After the declaration of company election, the elected chairperson gave his message to the workers that "The responsibility of the management is to serve and not to dominate the workers. Which of the following is one basic "assumption" underlying chairperson's statement?

- A. The management is capable of dominating the workers. ✓ **Correct answer**
- B. One must be decisive when facing company union for the first time
- C. Domination over workers by the management is a virtue.
- D. The management, preceding the company administration had been imposible
- E. The management chooses to serve rather than dominate the workers

A. correct: the chairperson's statement assumes the management is capable of dominating the workers — otherwise saying 'not to dominate' would be meaningless.

B. wrong: this is not an assumption underlying the chairperson's statement.

C. wrong: the statement says the opposite — the management's responsibility is to serve, not dominate.

D. wrong: this is not an assumption underlying the chairperson's statement (the paper prints 'imposible' for 'impossible').

E. wrong: this restates the conclusion, it is not the underlying assumption.

200 Minimise air travel's role in flu spread

Scientists recently published that influenza spreads around the world more efficiently in the modern era due to commercial air travel. Flu symptoms are severe enough that the sick would likely cancel or reschedule air travel, but an Infected person can travel across the globe before the first signs appear. Further, if symptoms develop while someone is on a plane, the patient's cough can spread the virus easily in the enclosed and closely packed environment. Which of the following would best minimize the role air travel can play in the spread of influenza during a pandemic?

- A. Refusing to allow children, the elderly, or others who are especially vulnerable to the travel by air during a pandemic
- B. Requiring all air travelers to wash their hands before bounding a plane
- C. Requiring air travelers to receive flu vaccinations far enough in advance of the trip to provide protection against the disease ✓ **Correct answer**
- D. Installing air filtration systems in the planes to kill any flu virus particles flowing though the filters
- E. Conducting medical examinations during the bounding process and prohibiting passengers with flu symptoms from flying

A. wrong: this protects the vulnerable but does not minimise air travel's role in spreading flu.

B. wrong: hand-washing helps but does not best minimise air travel's role in spreading flu.

C. correct: vaccinating travellers in advance best minimises the role air travel can play in spreading influenza, since infected people can travel before symptoms appear.

D. wrong: filtration helps on the plane, but vaccination best minimises air travel's role in spreading flu.

E. wrong: infected people can travel before the first signs appear, so symptom checks would not catch them. (Note: the paper prints 'bounding' for 'boarding' in options B and E.)

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