UHS MDCAT 2025, Paper D — Solved Past Paper

Body: University of Health Sciences (UHS), Lahore · **Post:** MDCAT (Medical & Dental College Admission Test), Paper D, Punjab · **Year:** 2025 · **Questions:** 180 in the original paper — **174 solved and verified**, 6 excluded as defective · **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. Answers are as of the 2025 sitting.

Source note: Primary source: mdcatpapers.com transcription of UHS MDCAT 2025 Paper D (accessed 31 Oct 2026), "transcribed word for word", 174 questions. Second reproduction: educationinkarachi, "UHS MDCAT 2025 Paper ID-D, 180 MCQs, With Complete Answer Key" (PDF crawled 1 Nov 2026) — a prep-site reproduction whose key contains demonstrable errors (Q22, Q122, Q156), used as corroboration only. Every answer was checked by worked derivation or reference fact, independently of the transcription's marked answer. 6 questions are DEFECTIVE-excluded by the assistant's decision under the owner's 8 Nov 2026 delegation (37be precedent): Q21, Q97, Q99, Q117, Q140, Q153 — see the excluded list. Q102's filed key B was corrected to C per the signed official key + three textbook treatments. Gap-fills printed 12, 42, 92, 95, 102, 156 were recovered from the second reproduction and VERIFIED from independent reference facts 8 Nov 2026; printed 156's key was corrected A → B per the signed official key. Numbering follows the file: transcription order Q1–Q174, printed numbers shown where the stem carries one, gap-fills in their own section; do NOT renumber.

Question Q1 Biology

Kidneys perform their osmoregulatory role under the effect of Antidiuretic Hormone, which type of urine is produced in this situation?

otonic urine with decreased volume

- B. Hypotonic urine with increased volume
- C. Hypertonic urine with decreased volume ✓ **Correct answer**
- D. Hypertonic urine with increased volume

A. Wrong on concentration: ADH makes urine more concentrated, not dilute.

B. Wrong on both counts: ADH reduces volume and concentrates urine.

C. ADH increases water reabsorption in the collecting ducts, so less, more concentrated (hypertonic) urine leaves the body; correct.

D. Right about concentration but wrong about volume: reabsorbing more water leaves less urine, not more.

Question Q2 Biology

Which part of brain controls transition between sleeping and wakefulness?

- A. Medulla oblongata
- B. Cerebellum
- C. Cerebrum
- D. Pons ✓ **Correct answer**

A. Controls autonomic functions such as breathing and heart rate, not the sleep–wake switch.

B. Coordinates movement and balance, not sleep–wake transitions.

C. Seat of higher processing and conscious thought, not the switch that moves the brain between sleep and waking.

D. With the adjacent reticular formation, the pons regulates sleep–wake transitions and REM sleep; correct.

Q3 Biology

Which part of the brain contains central chemoreceptors that monitor CO2 levels in blood?

- A. Pons
- B. Midbrain
- C. Hypothalamus
- D. Medulla oblongata ✓ **Correct answer**

A. Involved in sleep and relaying signals, but not the site of the central CO_2 chemoreceptors.

B. Concerned with visual/auditory reflexes and movement, not CO_2 sensing.

C. Regulates temperature, hunger and hormones, not central CO_2 chemoreception.

D. Central chemoreceptors in the medulla sense CO_2 via pH changes in cerebrospinal fluid and drive breathing; correct.

Question Q4 Biology

Which component of a reflex arc connects the sensory neuron to the motor neuron within the spinal cord?

- A. Receptor
- B. Effector
- C. Muscle fiber
- D. Associative neuron ✓ **Correct answer**

A. Detects the stimulus at the start of the arc; it does not connect neurons inside the cord.

B. Carries out the response (e.g. a muscle); it is at the end of the arc, not the internal link.

C. An effector tissue, not a connecting neuron.

D. The interneuron inside the spinal cord that links the sensory neuron to the motor

Question Q5 Biology

The 9.3.3.1 ratio of law of Independent assortment can be affected by

- A. Genetic drift
- B. Small population
- C. Gene linkage ✓ **Correct answer**
- D. Gene duplication

A. Changes allele frequencies in a population over generations; it does not alter the segregation ratio of a single dihybrid cross.

B. Sampling effects may distort observed ratios, but they do not systematically break independent assortment the way linkage does.

C. Genes on the same chromosome tend to be inherited together, so they do not assort independently and the 9:3:3:1 ratio breaks down; correct.

D. Creates extra gene copies; it does not prevent independent assortment of existing loci.

Question Q6 Biology

Best description of the process of crossing over during meiosis:

- A. Duplication of chromosome
- B. Exchange of genes between non-sister chromatids ✓ **Correct answer**
- C. Movement of chromosome to opposite poles
- D. Separation of sister chromatids

A. DNA replication before meiosis; crossing over is a later exchange, not duplication.

B. The reciprocal exchange of segments between non-sister chromatids of homologous chromosomes in prophase I; correct.

segregation, a separate later event.

D. Happens in anaphase II (and mitosis), not crossing over.

Question Q7 Biology

Total number of linkage groups in a normal human is:

- A. 02
- B. 23 ✓ **Correct answer**
- C. 46
- D. 92

A. No basis: humans have far more than two chromosomes.

B. One linkage group per chromosome type, i.e. the haploid number 23; correct.

C. The diploid chromosome count (two copies of each), not the number of linkage groups.

D. Twice the diploid number; no such count of linkage groups exists.

Question Q8 Biology

Nissls granule is a specialized structure in neuron formed by modification of :

- A. Golgi bodies & Smooth ER
- B. Peroxisome & Mitochondria
- C. Lysosome & Vacuole
- D. Ribosome & Rough ER ✓ **Correct answer**

A. The Golgi packages and the smooth ER makes lipids; neither forms Nissl substance.

B. Peroxisomes detoxify and mitochondria make ATP; neither is the source of Nissl bodies.

C. Lysosomes digest and vacuoles store; neither forms Nissl substance.

D. Nissl bodies are stacks of rough endoplasmic reticulum studded with ribosomes in the

| body; correct.

Question Q9 Biology

What is the function of a centromere?

- A. To protect the ends of chromosomes
- B. To hold sister chromatids together ✓ **Correct answer**
- C. To carry genetic information
- D. To initiate DNA replication

A. That is the telomere's job, at the chromosome tips.

B. The centromere is the constricted region joining sister chromatids and anchoring spindle fibres; correct.

C. The DNA sequence carries information; the centromere is a structural region, not the information itself.

D. Replication starts at origins of replication, not at centromeres.

Question Q10 Biology

All are the functions of lysosome EXCEPT:

- A. Intra cellular digestion
- B. Removal of the waste
- C. Autophagy
- D. Lipid synthesis ✓ **Correct answer**

A. A lysosome function: hydrolytic enzymes digest material inside the cell.

B. Lysosomes break down waste material for removal/recycling; a genuine function.

C. Lysosomes digest the cell's own worn-out parts (autophagy); a genuine function.

D. Lipids are made mainly in the smooth endoplasmic reticulum, not in lysosomes; correct

Question Q11 Biology

The first consequence of lymphatic blockage in tissues is:

- A. Deficiency of oxygen
- B. Loss of nerve signals
- C. Drop in blood pressure
- D. Excess fluid accumulation in tissue ✓ **Correct answer**

A. Oxygen delivery is a blood function; lymph blockage does not first starve tissue of oxygen.

B. Nerves are not blocked by lymphatic obstruction as a first consequence.

C. A systemic effect, not the immediate local consequence of a blocked lymph vessel.

D. Blocked drainage leaves interstitial fluid behind, causing oedema (swelling); correct.

Question Q12 Biology

Which of the following is the correct pathway of nerve Impulse?

- A. Receptors--> CNS--> Effectors ✓ **Correct answer**
- B. Effectors--> Receptors--> CNS
- C. CNS--> Effectors--> Receptors
- D. Effectors--> CNS --> Receptors

A. Stimulus detected by receptors, processed in the central nervous system, response sent to effectors; correct.

B. Reversed: effectors act last, not first.

C. Receptors must come first; the CNS cannot receive what no receptor has detected.

D. Reversed throughout.

Q13 Biology

The neurotransmitters are secreted by the neuron from:

- A. Axon ends ✓ **Correct answer**
- B. Dendrite end
- C. Nissl's granules
- D. Cell body

A. Transmitter is stored in synaptic vesicles at axon terminals and released into the synaptic cleft from there; correct.

B. Dendrites receive signals; they are not the usual transmitter-release sites.

C. Protein-making machinery in the cell body, not release sites.

D. The soma integrates signals; transmitter release happens at the terminals.

Question Q14 Biology

Hippocampus plays an important role in the:

- A. Formation of short-term memory
- B. Formation of image on retina
- C. Formation of long-term memory ✓ **Correct answer**
- D. Formation of emotions

A. Short-term holding is mainly a working-memory function; the hippocampus's key role is consolidating memories into long-term storage.

B. An optical function of the eye, nothing to do with the hippocampus.

C. The hippocampus consolidates short-term memories into long-term declarative memories; correct.

D. Emotions are generated mainly by limbic structures such as the amygdala; the hippocampus is not primarily an emotion generator.

Q15 Biology

Enzymes activity decreases at very low or high pH because:

- A. Substrate concentration increases
- B. Enzymes become denatured ✓ **Correct answer**
- C. Product formation increases
- D. Temperature becomes constant

A. Substrate concentration is not raised by extreme pH, and more substrate would raise, not lower, activity.

B. Extreme pH disrupts ionic bonds and the enzyme's three-dimensional shape, destroying activity; correct.

C. Product formation falls when activity falls; it is not the cause.

D. Temperature is irrelevant to the pH effect described.

Question Q16 Biology

The complementary base pairing in DNA is important because it:

- A. Maintains the tertiary structure of enzymes
- B. Provides energy for all cell metabolism
- C. Enables protein to fold properly
- D. Allows DNA act as a genetic blueprint during replication ✓ **Correct answer**

A. Enzyme shape depends on amino-acid sequence and bonding, not DNA base pairing.

B. Energy comes from ATP and related carriers, not from base pairing.

C. Protein folding follows the amino-acid sequence; base pairing does not fold proteins.

D. Each strand templates a complementary new strand, so genetic information is copied faithfully; correct.

Q17 Biology

A mature duplicated chromosome consists of:

- A. Two identical double helical DNA molecules ✓ **Correct answer**
- B. Two different double helical DNA molecules
- C. A double helical DNA molecule distributed in both chromatids
- D. Histone chains wrapped around DNA core

A. After replication the two sister chromatids carry identical DNA double helices; correct.

B. Sister chromatids are copies, not different molecules.

C. Each chromatid has its own complete double helix; one molecule is not shared between them.

D. Histones package DNA, but that describes chromatin packing, not what a duplicated chromosome consists of.

Question Q18 Biology

The most primitive respiratory process occurring in a living cell is;

- A. Lactic acid fermentation
- B. Alcoholic fermentation
- C. Glycolysis ✓ **Correct answer**
- D. Krebs's cycle

A. A downstream anaerobic pathway that follows glycolysis; it is not the most primitive step.

B. Also downstream of glycolysis (pyruvate → ethanol); not the earliest pathway.

C. The universal, ancient, oxygen-independent pathway present in nearly all cells, predating aerobic respiration; correct.

D. An aerobic, later-evolved pathway inside mitochondria, not primitive.

Q19 Biology

Receive, retain and nourish a fertilized ovum is the main function of:

- A. Cervix
- B. Uterus ✓ **Correct answer**
- C. Ovary
- D. Oviduct

A. The lower opening of the uterus; it does not house or nourish the embryo.

B. The womb: implantation, retention and nourishment of the developing embryo/fetus; correct.

C. Produces ova and hormones; it does not receive or nourish a fertilized ovum.

D. Transports the ovum and is the usual site of fertilisation, but the embryo does not stay and grow there.

Question Q20 Biology

The primary function of larynx is:

- A. Humidifying air
- B. Filtering dust
- C. Gaseous exchange
- D. Voice production ✓ **Correct answer**

A. Done mainly by the nasal passages, not the larynx.

B. Nasal hairs and mucus filter air; not the larynx's primary role.

C. Happens in the alveoli of the lungs.

D. The larynx houses the vocal cords; its primary function is voice production; correct.

Q22 Biology

Left and right cerebral hemispheres are connected with each other by:

- A. Corpus luteum
- B. Corpus callosum ✓ **Correct answer**
- C. A band of dendrites
- D. Dorsal and ventral nerve roots

A. An ovarian endocrine structure after ovulation; nothing to do with the brain.

B. The large white-matter commissure joining the two cerebral hemispheres; correct.

C. Dendrites receive signals within neurons; they do not form the interhemispheric bridge.

D. Spinal nerve roots, not a brain commissure.

Question Q23 Biology

Which is the common feature between cardiac and smooth muscles?

- A. Voluntary
- B. Involuntary ✓ **Correct answer**
- C. Branched
- D. Unbranched

A. Neither is voluntary: skeletal muscle is the voluntary type.

B. Both cardiac and smooth muscle work without conscious control, under autonomic regulation; correct.

C. True of cardiac muscle only; smooth muscle fibres are spindle-shaped, not branched.

D. True of smooth muscle only; cardiac fibres branch.

Q24 Biology

The joints which cause rotational movements are

- A. Hinge
- B. Ball and Socket ✓ **Correct answer**
- C. Cartilage
- D. Sutures

A. Allows flexion and extension in one plane only (e.g. elbow, knee); no rotation.

B. The shoulder and hip allow rotation and multi-axial movement; correct.

C. A tissue, not a joint type that causes rotation.

D. Immovable fibrous joints of the skull; no movement at all.

Question Q25 Biology

Self-fertilization in plants through successive generations can lead to the development of:

- A. Hybrid breeds of plants
- B. Variations in coming generation
- C. True breeding plants ✓ **Correct answer**
- D. Adaptation with their environment

A. Hybrids come from crossing different lines; selfing does the opposite, fixing lines.

B. Selfing reduces heterozygosity and variation, it does not increase it.

C. Repeated self-fertilisation produces homozygous lines that breed true for their traits; correct.

D. An ecological/evolutionary outcome, not the direct genetic consequence of selfing.

Q26 Biology

Which part of the neuron typically receives incoming signals from other neurons?

- A. Axon
- B. Dendrites ✓ **Correct answer**
- C. Myelin sheath
- D. Synaptic knob

A. Conducts the outgoing action potential away from the cell body.

B. Branching processes that receive synaptic inputs from other neurons; correct.

C. Insulates the axon to speed conduction; it receives no synaptic input.

D. The presynaptic terminal that SENDS transmitter, at the axon end.

Question Q27 Biology

Why thick filaments are unable to bind with thin filament in a relaxed muscle fiber?

- A. Actin blocks the myosin binding site
- B. Tropomyosin blocks the myosin binding site ✓ **Correct answer**
- C. Troponin blocks the myosin binding site
- D. Tropomyosin blocks the troponin binding site

A. Actin IS the thin filament carrying the binding sites; it does not block them.

B. In relaxed muscle tropomyosin lies across actin's myosin-binding sites; correct.

C. Troponin regulates tropomyosin's position in response to Ca^{2+}; it does not itself cover the sites.

D. Reversed: troponin binds tropomyosin/actin and controls it.

Q28 Biology

Which of the following best highlights the importance of proteins in Immunity?

- A. They act as receptors of pathogens
- B. They are long term energy reserves
- C. They act as antibodies ✓ **Correct answer**
- D. They act as mechanical barrier to pathogens

A. Some proteins are receptors, but the defining immune role of proteins asked for here is antibodies.

B. Long-term energy storage is the role of fats, not proteins.

C. Antibodies are proteins made by B cells that specifically recognise and neutralise pathogens; correct.

D. Mechanical barriers are skin, mucus and cilia, not proteins as such.

Question Q29 Biology

The secondary structure of proteins is stabilized by:

- A. Ionic bonds
- B. Hydrogen bonds ✓ **Correct answer**
- C. Disulfide bridges
- D. Hydrophobic exclusion

A. Salt bridges stabilise mainly tertiary structure, not the alpha helix/beta sheet pattern.

B. Hydrogen bonds between backbone carbonyl and amide groups hold alpha helices and beta sheets together; correct.

C. Covalent links between cysteine residues that stabilise tertiary (and quaternary) structure.

D. Hydrophobic interactions drive folding of the protein core, mainly a tertiary-structure

Question Q30 Biology

The following is an example of a globular protein.

- A. Keratin
- B. Collagen
- C. Hemoglobin ✓ **Correct answer**
- D. Histone

A. A fibrous structural protein of hair, nails and skin.

B. A fibrous structural protein of connective tissue.

C. A soluble, roughly spherical (globular) transport protein; correct, and the standard textbook example among these options.

D. Histones are also globular DNA-packaging proteins, but haemoglobin is the intended standard example; the stem asks for "an example", and haemoglobin is the keyed one.

Question Q31 Biology

The process of osmoregulation refers to:

- A. The filtration of blood to remove metabolic waste
- B. The regulation of solute and water movement between an organism and its environment ✓ **Correct answer**
- C. The creation of an osmotic gradient in the kidney medulla
- D. The secretion of hormones that control blood plasma

A. That describes excretion/filtration, a narrower kidney function, not osmoregulation as a whole.

B. The broad definition: keeping water and solute balance across membranes and with the surroundings; correct.

anism the kidney uses, it is part of osmoregulation, not its definition.

D. Hormones such as ADH assist osmoregulation; secreting them is not what the term means.

Question Q32 Biology

A baby girl is born with hemophilia, which is an X-linked recessive disorder. What are the most likely genotypes of her parents?

- A. The mother is a carrier and the father is normal.
- B. The mother is hemophiliac and the father is normal.
- C. The mother is carrier and the father is hemophiliac ✓ **Correct answer**
- D. Both are normal.

A. A normal father gives his daughter a normal X, so she could at most be a carrier, never affected.

B. Again the normal father gives a normal X, so the daughter cannot be affected.

C. The daughter must receive an affected X from her father and an affected (or carrier) X from her mother; a carrier mother and haemophiliac father is the most likely pairing; correct.

D. Two normal parents cannot produce an affected daughter for an X-linked recessive trait.

Question Q33 Biology

Identify the most appropriate function of chromosomes

- A. Energy production and storage
- B. Protein synthesis and regulation
- C. Storage of genetic information ✓ **Correct answer**
- D. Lipid metabolism and transport

dria and storage molecules do this, not chromosomes.

B. Ribosomes synthesise proteins and genes regulate them; the chromosome's own role is storing the instructions.

C. Chromosomes organise and carry DNA, the store of hereditary information; correct.

D. A metabolic/transport function, not a chromosomal one.

Question Q34 Biology

Enzymes belong to which class of biomolecules?

- A. Carbohydrates
- B. Lipids
- C. Proteins ✓ **Correct answer**
- D. Nucleic acids

A. Energy and structural molecules (sugars, starch, cellulose), not enzymes.

B. Fats, membranes and steroids, not enzymes.

C. Almost all enzymes are proteins (polypeptides) that catalyse reactions; correct.

D. DNA and RNA store and transmit genetic information; only a few catalytic RNAs (ribozymes) are exceptions, and they are not the class asked for.

Question Q35 Biology

_____ arranges the DNA Into the chromosomes in a eukaryotic cell.

- A. Hormones
- B. Elastin
- C. Histone ✓ **Correct answer**
- D. Nucleosome

A. Chemical messengers; they do not package DNA.

connective-tissue protein, nothing to do with chromosomes.

C. Histone proteins bind DNA and package it into nucleosomes and chromatin, organising it into chromosomes; correct.

D. The DNA–histone complex that RESULTS from histone packaging, not the agent doing the arranging.

Question Q36 Biology

The function of nucleolus is to make:

- A. rDNA
- B. Lysosomes
- C. Ribosomes ✓ **Correct answer**
- D. Chromosomes

A. rDNA (the genes for ribosomal RNA) sits in the nucleolar organiser region; the nucleolus does not "make rDNA".

B. Lysosomes bud from the Golgi apparatus, not the nucleolus.

C. The nucleolus transcribes rRNA and assembles ribosomal subunits; correct.

D. Chromosomes are the whole DNA–protein structures of the nucleus, not a nucleolar product.

Question Q37 Biology

Which of the following blood vessels have lowest blood velocity with correct reason for low blood velocity?

- A. Arteries: Due to thick walls
- B. Capillaries: due to highest overall cross-sectional area ✓ **Correct answer**
- C. Veins: due to blood flow against the gravity
- D. Capillaries: Due to two-way blood flow in capillaries

ave the highest velocity, wall thickness is not the reason for velocity anyway.

B. The capillary bed's huge total cross-section slows flow (velocity = flow/area), allowing exchange; correct.

C. Veins are slower than arteries but faster than capillaries, and gravity is not the stated reason.

D. Blood flows one way through capillaries; there is no two-way flow.

Question Q38 Biology

An active athlete has more stamina of running compared to an officer of same age with physically inactive lifestyle. Which of the following organelles has greatly increased in the muscle cells of athlete?

- A. Nucleus
- B. Mitochondria ✓ **Correct answer**
- C. Golgi bodies
- D. Smooth endoplasmic reticulum (SER)

A. Muscle fibres are multinucleate already; the nucleus does not multiply to give stamina.

B. Endurance training increases mitochondrial number (biogenesis), raising aerobic ATP production and stamina; correct.

C. Package and secrete proteins; they do not drive aerobic stamina.

D. Makes lipids and detoxifies; in muscle the related sarcoplasmic reticulum stores Ca^{2+}, but it is not the organelle whose increase explains stamina.

Question Q39 Biology

Once an action potential reaches the membrane of a skeletal muscle fiber, what is the first event that occurs in the contraction process?

n and myosin form a cross-bridge

- B. Calcium is pumped back into the sarcoplasmic reticulum
- C. Calcium is released from the sarcoplasmic reticulum ✓ **Correct answer**
- D. ATP is hydrolyzed by troponin

A. Happens only after Ca^{2+} exposes the binding sites.

B. The relaxation step at the END of contraction, not the first event.

C. The action potential triggers Ca^{2+} release into the cytosol, the immediate first event; correct.

D. ATP is hydrolysed by myosin ATPase, not troponin; and hydrolysis follows Ca^{2+} release.

Question Q40 Biology

The pubic symphysis is a slightly moveable joint joined by which of the following tissue?

- A. Elastic cartilage
- B. Fibrocartilage ✓ **Correct answer**
- C. Costal cartilage
- D. Articular cartilage

A. Found in the epiglottis and pinna; not the pubic symphysis.

B. The strong, slightly compressible tissue joining the pubic bones in this secondary cartilaginous joint; correct.

C. Hyaline cartilage joining ribs to the sternum; not the symphysis.

D. The hyaline cartilage covering bone ends in synovial joints; it does not join the pubic bones.

Question Q41 Biology

Mendel crossed a plant with round yellow seeds (RRYY) and a plant with wrinkled green

, what was the phenotype of all F1 offspring?

- A. All round green
- B. All round yellow ✓ **Correct answer**
- C. All wrinkled yellow
- D. All wrinkled green

A. Green is recessive; no F1 plant shows it when the other parent gives the dominant yellow allele.

B. All F1 are RrYy, showing both dominant traits, round and yellow; correct.

C. Wrinkled is recessive and cannot appear in F1 here.

D. Both recessive traits; impossible in F1 of this cross.

Question Q42 Biology

In a normal 28 days menstrual cycle when would you expect the LH surge to occur?

- A. Days 7-10
- B. Days 11-14 ✓ **Correct answer**
- C. Days 15-18
- D. Days 19-22

A. Early follicular phase; the follicle is still maturing, no surge yet.

B. The mid-cycle window bracketing day 14, when the LH surge triggers ovulation; correct.

C. Early luteal phase, after ovulation; the surge has passed.

D. Mid-luteal phase, dominated by progesterone; no LH surge.

Question Q43 Biology

Which property of water helps in moderating Earth's climate and maintaining stable temperature in aquatic environment?

- viscosity
- B. High specific heat capacity ✓ **Correct answer**
- C. High surface tension
- D. High polarity

A. Viscosity affects flow, not heat buffering.

B. Water absorbs or releases large amounts of heat with little temperature change, buffering climate and aquatic temperatures; correct.

C. Affects droplets and surface films, not thermal moderation.

D. Explains water's solvent power, not its heat-buffering capacity directly.

Question Q44 Biology

Effect of increased substrate concentration on enzyme activity:

- A. Decrease the rate of reaction
- B. Increase the reaction rate until all active sites are saturated ✓ **Correct answer**
- C. Have no effect on the reaction rate
- D. Increase the rate of reaction in a straight diagonal line

A. More substrate does not slow the reaction (unless substrate inhibition, not the general case here).

B. Rate rises with substrate, then levels off at Vmax when every active site is occupied; correct.

C. False at low substrate concentrations, where rate rises steeply.

D. The rise is a curve that plateaus, not a straight line without limit.

Question Q45 Biology

An oligosaccharide is made up of at least:

saccharide units

- B. ten saccharide units
- C. three to ten saccharide units ✓ **Correct answer**
- D. more than ten saccharide units

A. Two units make a disaccharide; some textbooks count disaccharides among oligosaccharides (2–10 units), so this is defensible under that definition — the answer rests on the definition the paper uses.

B. Ten is the upper end of the usual range, not the minimum.

C. The definition this paper uses: oligosaccharides have 3–10 monosaccharide units, disaccharides (2) being classed separately; correct under that convention only.

D. More than about ten units is a polysaccharide, not an oligosaccharide. PROMOTED to VERIFIED — 8 Nov 2026 push under the owner's verification standard (one source is FINAL): the 3–10 definition is the standard/JCBN one. Caveat kept: some sources (MeSH) count 2–10, including disaccharides; the paper uses the 3–10 convention.

Question Q46 Biology

Which statement best explains the difference between humoral and cell mediated Immune response?

- A. Humoral immunity involves B-Lymphocytes and cell mediated immunity involves T-Lymphocytes ✓ **Correct answer**
- B. Humoral immunity destroys viruses and cell mediated immunity destroys bacteria
- C. Humoral immunity is specific and cell mediated immunity is nonspecific
- D. Humoral immunity uses antibodies and cell mediated immunity does not involve immune cells

A. The defining cellular distinction: B cells/antibodies vs T cells; correct.

B. Both arms act against both kinds of pathogen; the split is not by pathogen type.

pecific, adaptive responses.

D. Cell-mediated immunity is carried out by T lymphocytes; it plainly involves immune cells.

Question Q47 Biology

Which of the following is the correct higher (left) to lower (right) sequence of molecules with respect to the amount in the cell?

- A. DNA → rRNA → tRNA → mRNA
- B. rRNA → tRNA → mRNA → DNA ✓ **Correct answer**
- C. mRNA → tRNA → rRNA → DNA
- D. DNA → mRNA → tRNA → rRNA

A. Puts DNA first and reverses the RNA order; DNA is not the most abundant by the measure this question uses.

B. The keyed order: rRNA is the largest fraction of cellular RNA (~80%), then tRNA, then mRNA, with DNA placed last — but "amount" mixes mass, molecule number and copy number, so the DNA position rests on the paper's convention only.

C. mRNA is the smallest RNA fraction, not the largest.

D. Reverses the RNA abundance order entirely. PROMOTED to VERIFIED — 8 Nov 2026 push under the owner's verification standard (one source is FINAL). Caveat kept: "amount" mixes mass, molecule number and copy number, so the DNA-last position rests on the paper's convention; the RNA order itself (rRNA > tRNA > mRNA) is confirmed.

Question Q48 Biology

A person in hot weather is unable to maintain body temperature. Which physiological process has failed?

- A. Vasodilation & sweating ✓ **Correct answer**

- C. Shivering
- D. Renin secretion

A. Heat loss in hot weather depends on dilated skin vessels and sweat evaporation; if these fail, temperature cannot be held down; correct.

B. A cold-weather response that conserves heat; its failure would not cause overheating.

C. Generates heat in the cold; irrelevant to failing to cool down.

D. Part of blood-pressure/fluid regulation, not the heat-loss mechanism.

Question Q49 Biology

The main idea in Darwin's Theory of "Origin of species by natural selection" is:

- A. Inheritance of acquired traits
- B. Use and disuse of organs
- C. Species never change
- D. Evolution occurs through gradual accumulation of adaptation through successive generations ✓ **Correct answer**

A. Lamarck's idea, explicitly rejected by Darwinian theory.

B. Lamarck again, not Darwin.

C. The opposite of Darwin's theory, which is about species changing over time.

D. Natural selection gradually accumulates favourable variations across generations; correct.

Question Q50 Biology

Which of the following is a key feature of RNA?

- A. Deoxyribose and thymine

ible stranded and thymine

- C. Ribose and uracil ✓ **Correct answer**
- D. Ribose and thymine

A. The sugar and base of DNA, not RNA.

B. DNA is (usually) double-stranded with thymine; RNA is usually single-stranded with uracil.

C. RNA's sugar is ribose and it uses uracil in place of thymine; correct.

D. Right sugar, wrong base: RNA has uracil, not thymine.

Question Q51 Biology

Which of the following types of RNA makeup the largest proportion of total cellular RNA?

- A. Messenger RNA
- B. Ribosomal RNA ✓ **Correct answer**
- C. Transfer RNA
- D. Catalytic RNA (ribozyme)

A. Only a few percent of cellular RNA; it is the template, not the bulk.

B. About 80% of total cellular RNA, forming the core of the abundant ribosomes; correct.

C. Roughly 15% of cellular RNA, second to rRNA.

D. A functional description (many ribozymes ARE rRNA); not a separate abundance class, and not the largest.

Question Q52 Biology

The bacterium Treponema Pallidum is responsible for which sexually transmitted disease?

- A. Syphilis ✓ **Correct answer**

- C. Gonorrhea
- D. Genital herpes

A. Treponema pallidum is the spirochaete that causes syphilis; correct.

B. Caused by Chlamydia trachomatis, a different bacterium.

C. Caused by Neisseria gonorrhoeae.

D. Caused by herpes simplex virus, not a bacterium at all.

Question Q53 Biology

Tissue fluid in a lymphatic system is called as:

- A. Plasma
- B. Matrix
- C. Lymph ✓ **Correct answer**
- D. Blood

A. The fluid part of blood, before it becomes tissue fluid and lymph.

B. Extracellular matrix is the structural material around cells, not the fluid in lymph vessels.

C. Interstitial (tissue) fluid once collected into lymphatic vessels is called lymph; correct.

D. Blood is the fluid in blood vessels, not in lymphatics.

Question Q54 Biology

Which one of the following biomolecules is a polymer/polysaccharide?

- A. Sucrose
- B. Pentose
- C. Lactose

cogen ✓ **Correct answer**

A. A disaccharide (two sugar units), not a polymer.

B. A five-carbon monosaccharide, a single unit.

C. A disaccharide (glucose + galactose).

D. A large branched polysaccharide polymer of glucose, the animal storage carbohydrate; correct.

Question Q55 Biology

Olfactory receptors are the type of:

- A. photoreceptors
- B. mechanoreceptors
- C. thermoreceptors
- D. chemoreceptors ✓ **Correct answer**

A. Detect light (retina), not smells.

B. Detect pressure, touch and vibration.

C. Detect temperature.

D. Detect chemicals; olfactory receptors detect odorant molecules, so they are chemoreceptors; correct.

Question Q56 Biology

Which of the following organisms eliminate nitrogenous waste mainly in the form of uric acid?

- A. Freshwater Fish
- B. Amphibians
- C. Birds ✓ **Correct answer**

A. Ammonotelic: they excrete ammonia directly into abundant water.

B. Mainly ureotelic as adults (urea), ammonotelic as aquatic larvae; not mainly uric acid.

C. Uricotelic: they excrete nitrogen as uric acid paste, conserving water; correct.

D. Ureotelic: urea is the main nitrogenous waste.

Question Q57 Biology

Which of the following cells possess Nissl's granules?

- A. Nerve cells ✓ **Correct answer**
- B. WBC
- C. RBC
- D. Platelets

A. Nissl bodies (rough ER + ribosomes) occur in neuronal cell bodies; correct.

B. White blood cells have no Nissl granules.

C. Mature red blood cells have no nucleus, ER or ribosomes at all.

D. Cell fragments with no nucleus or Nissl substance.

Question Q58 Biology

Which part of human brain is involved in maintaining the posture and balance of the body?

- A. Cerebrum
- B. Cerebellum ✓ **Correct answer**
- C. Hypothalamus
- D. Medulla oblongata

...ought, memory and voluntary action initiation, not balance coordination.

B. Coordinates muscle activity, posture and equilibrium; correct.

C. Homeostasis, hormones and drives, not posture.

D. Autonomic control (breathing, heart rate), not balance.

Question Q59 Biology

Arthritis is:

- A. Inflammation of joints ✓ **Correct answer**
- B. Herniation of intervertebral disc
- C. Fusion of vertebral joint
- D. tingling along the length of legs

A. Literally "arthr-" (joint) + "-itis" (inflammation); correct.

B. A slipped disc, a different condition.

C. Ankylosis, a possible late outcome, not the definition of arthritis.

D. A nerve symptom (e.g. sciatica), not arthritis.

Question Q60 Biology

Which type of joint is present in pubis?

- A. Fibrous joints
- B. Immoveable joints
- C. Cartilaginous joints ✓ **Correct answer**
- D. Freely moveable joints

A. Joints joined by fibrous tissue (e.g. skull sutures); the pubic symphysis is joined by cartilage.

ses allow no movement, the symphysis is slightly moveable.

C. The pubic symphysis is a cartilaginous joint (amphiarthrosis) joined by fibrocartilage; correct.

D. Synovial joints (e.g. knee, shoulder); the symphysis is not one.

Question Q61 Biology

Which type of neurons stimulate muscles to contract In a reflex arc?

- A. Motor neurons ✓ **Correct answer**
- B. Sensory neurons
- C. Interneurons
- D. Afferent neurons

A. Efferent neurons carrying the signal from the CNS to the muscle, causing contraction; correct.

B. Carry information INTO the CNS from receptors.

C. Link sensory and motor neurons inside the CNS; they do not directly stimulate muscle.

D. Another name for sensory neurons, carrying signals toward the CNS.

Question Q62 Biology

Which of the following statements best compares cell division in prokaryotic and Eukaryotic cells?

- A. Eukaryotes divide by budding ; prokaryotes by mitosis
- B. Eukaryotes use binary fission ; prokaryotes by meiosis
- C. Eukaryotes divide by mitosis ; prokaryotes by binary fission ✓ **Correct answer**
- D. Both use mitosis by cell division

A. Reversed and wrong: prokaryotes have no mitosis; budding is a mode in some yeasts,

ral eukaryotic mechanism.

B. Both halves reversed: meiosis is eukaryotic, binary fission prokaryotic.

C. Correct general comparison (meiosis being the eukaryotic gamete-forming division).

D. Prokaryotes have no nucleus or spindle, so no mitosis.

Question Q63 Biology

Which of the following best describes "acquired characteristics" according to Lamarckism?

- A. Traits caused by mutation
- B. Traits inherited from parents
- C. Traits developed by use or disuse ✓ **Correct answer**
- D. Traits selected by nature

A. Mutation is the raw material in Darwinian/modern theory, not Lamarck's acquired characteristics.

B. All inherited traits come from parents; Lamarck's distinctive claim is about traits ACQUIRED during life.

C. Lamarck held that organs develop through use or shrink through disuse during an organism's lifetime and are then inherited; correct.

D. Natural selection, Darwin's mechanism, not Lamarck's.

Question Q64 Biology

According to Lock and Key model, the active site is regarded as:

- A. Rigid and specific ✓ **Correct answer**
- B. Flexible and specific
- C. Rigid and non specific

A. The lock-and-key model pictures a fixed-shape active site fitting one substrate exactly, like a key in a lock; correct.

B. Flexibility is the INDUCED-FIT model, not lock-and-key.

C. Rigidity without specificity would fit many substrates, contradicting the model.

D. Describes neither model: enzymes are specific.

Question Q65 Biology

Peptide bonds are Important In protein because they:

- A. Affect solubility
- B. Hold R-groups
- C. Link amino acid ✓ **Correct answer**
- D. help in releasing oxygen

A. Solubility depends on R-groups and folding, not on the peptide bond itself.

B. R-groups hang off the amino-acid backbone; peptide bonds do not hold them.

C. Peptide bonds are the covalent links joining amino acids into a polypeptide chain (primary structure); correct.

D. Oxygen release is haemoglobin's function, unrelated to peptide bonds.

Question Q66 Biology

Why are retroviruses placed in a separate class of RNA viruses?

- A. They always infect animal cells only
- B. Their RNA acts directly as mRNA
- C. They lack protein coats
- D. They use reverse transcriptase to make DNA from RNA ✓ **Correct answer**

ctive! Many RNA viruses infect animals, and retroviruses are defined by replication, not host range.

B. That describes positive-sense RNA viruses, not retroviruses.

C. Retroviruses have capsids/envelopes like other viruses; they do not lack protein coats.

D. Reverse transcription of RNA into DNA (later integrated into the host genome) is the defining retroviral feature; correct.

Question Q67 Biology

Reversible inhibitors differ from Irreversible Inhibitors because they:

- A. Binds permanently and cannot be removed
- B. Bind temporarily and can be removed ✓ **Correct answer**
- C. Permanently inactivate the enzyme
- D. Change enzyme structure permanently

A. That is the irreversible inhibitor.

B. Reversible inhibitors bind non-covalently and dissociate, restoring enzyme activity; correct.

C. Irreversible inhibition, not reversible.

D. Again the irreversible case (covalent modification).

Question Q68 Biology

Which is an enzyme activator secreted by the Intestinal glands:

- A. Amylase
- B. Pepsinogens
- C. Enterokinase ✓ **Correct answer**
- D. Lipase

digesting enzyme, not an activator of other enzymes.

B. The inactive precursors of pepsin, secreted by the stomach, not intestinal activators.

C. Enteropeptidase, secreted by intestinal mucosa, activates trypsinogen to trypsin, starting pancreatic enzyme activation; correct.

D. A fat-digesting enzyme, not an activator.

Question Q69 Biology

In which of the following combination, both components have Hyaline cartilage?

- A. Epiglottis & intervertebral disc
- B. Trachea & intervertebral disc
- C. Nose & pinna
- D. Nose & trachea ✓ **Correct answer**

A. Epiglottis is elastic cartilage and discs are fibrocartilage; neither is hyaline.

B. Tracheal rings are hyaline, but intervertebral discs are fibrocartilage.

C. The nose (septum) is hyaline, but the pinna (ear flap) is elastic cartilage.

D. Both the nasal septum and the tracheal rings are hyaline cartilage; correct.

Question Q70 Biology

According to Lamarck, the evolution of long necks in giraffes is explained by:

- A. Natural selection
- B. Genetic mutation
- C. Survival of the fittest
- D. Stretching of necks over generations ✓ **Correct answer**

A. Darwin's mechanism, not Lamarck's.

rn source of variation, not Lamarck's explanation.

C. Darwinian/Spencerian phrasing, not Lamarck.

D. Lamarck: giraffes stretched to reach high foliage, the acquired length was inherited, accumulating over generations; correct as Lamarck's account.

Question Q71 Biology

The process of spermatogenesis occurs in which part of the male reproductive system?

- A. Seminiferous tubules ✓ **Correct answer**
- B. Vas deferens
- C. Scrotum
- D. Epididymis

A. Coiled tubules in the testes where sperm are produced; correct.

B. The duct carrying sperm away from the testis; no sperm production.

C. The sac holding the testes at the right temperature; not the site of production.

D. Stores and matures sperm, but spermatogenesis does not occur there.

Question Q72 Biology

Which layer of uterus nourishes the embryo after implantation?

- A. Cervical epithelium
- B. Myometrium
- C. Endometrium ✓ **Correct answer**
- D. Perimetrium

A. Lines the cervix; it does not nourish the implanted embryo.

B. The muscular middle layer that contracts in labour; not the nourishing lining.

lining where implantation occurs and which nourishes the embryo (forming the maternal part of the placenta); correct.

D. The outer serosal covering of the uterus.

Question Q73 Biology

The main role of mRNA during protein synthesis is to:

- A. Carry genetic information for protein synthesis ✓ **Correct answer**
- B. stabilize ribosome
- C. deliver amino acids
- D. provide platform for proteins synthesis

A. mRNA carries the codon sequence copied from DNA that specifies the amino-acid order; correct.

B. Ribosomal RNA and proteins stabilise the ribosome, not mRNA.

C. tRNA delivers amino acids to the ribosome.

D. The ribosome is the platform; mRNA is the message read on it.

Question Q74 Biology

Glycoproteins are formed as a result of the combination of:

- A. Lipids and proteins
- B. Carbohydrates and proteins ✓ **Correct answer**
- C. Nucleic acid and proteins
- D. Fatty acids and carbohydrates

A. That combination gives lipoproteins, not glycoproteins.

B. Glycoproteins are proteins with covalently attached carbohydrate (sugar) chains; correct.

nucleoproteins (e.g. chromosomes), not glycoproteins.

D. No protein is involved, so this cannot give a glycoprotein.

Question Q75 Biology

A student observed a boundary In both plant and animal cells that controls entry and exit of substances. Which of the following structures is likely being observed?

- A. Mitochondria
- B. Golgi apparatus
- C. Plasma membrane ✓ **Correct answer**
- D. Cell wall

A. An internal energy organelle, not the cell boundary.

B. An internal packaging organelle, not the boundary.

C. Surrounds both plant and animal cells and selectively controls entry and exit; correct.

D. Present only in plant cells (and some others), never in animal cells, so it cannot be the structure seen in both.

Question Q76 Biology

If a normal person marries with colour blind female what will be the possibility of normal male child:

- A. 0% ✓ **Correct answer**
- B. 25%
- C. 50%
- D. 75%

A. Colour blindness is X-linked recessive. Reading "normal person" as a normal man (the only reading under which the options make sense, since the spouse is female): a colour-blind mother (X^cX^c) passes an affected X to every son, so every male child is colour-blind.

normal, correct under that reading only.

B. No Punnett outcome gives a quarter of sons normal here.

C. The figure for sons of a CARRIER mother and normal father, not a colour-blind mother.

D. No cross with a colour-blind mother yields three-quarters normal sons. NOTE: the stem does not state the sex of the "normal person"; the answer rests on reading it as a normal man. PROMOTED to VERIFIED — 8 Nov 2026 push under the owner's verification standard (one source is FINAL). Caveat kept.

Question Q77 Biology

Which of the following characters is shared by both skeletal and cardiac muscles?

- A. Presence of Striation ✓ **Correct answer**
- B. Involuntary control
- C. Multinucleated fibers
- D. Intercalated discs

A. Both have ordered sarcomeres giving a striated appearance; correct.

B. Cardiac only; skeletal muscle is voluntary.

C. Skeletal fibres are multinucleate; cardiac cells are typically single- (or double-) nucleated.

D. Cardiac muscle only; skeletal fibres have none.

Question Q78 Biology

Which of the following muscle types are involuntary in action?

- A. Skeletal and smooth
- B. Skeletal and cardiac
- C. Cardiac and smooth ✓ **Correct answer**

ooth muscle only

A. Skeletal muscle is voluntary, so this pair is wrong.

B. Skeletal muscle is voluntary.

C. Both work involuntarily (cardiac autorhythmic, smooth under autonomic control); correct.

D. True but incomplete: cardiac muscle is involuntary too, and the question asks which types (plural).

Question Q79 Biology

In which of the following combinations, both components have non-striated muscle fibers?

- A. Intestine & biceps
- B. Intestine & blood vessels ✓ **Correct answer**
- C. Heart & lungs
- D. Stomach & heart

A. Intestine wall is smooth (non-striated), but biceps is skeletal (striated).

B. Both have smooth, non-striated muscle in their walls; correct.

C. Heart muscle is striated (cardiac); the lungs' airways have some smooth muscle but the heart disqualifies the pair.

D. Stomach wall is smooth, but heart muscle is striated.

Question Q80 Chemistry

Value of R gas constant in J mol-1 K-1 is

- A. 8.314 ✓ **Correct answer**
- B. 62.4

- D. 62400

A. R = 8.314 J mol^{-1} K^{-1}; correct.

B. R in L·mmHg mol^{-1} K^{-1} is about 62.36, not in joules per mole-kelvin.

C. A misprint of 0.0821, which is R in L·atm mol^{-1} K^{-1}, not J mol^{-1} K^{-1}.

D. R in other unit combinations (e.g. cm^3·mmHg), not J mol^{-1} K^{-1}.

Question Q81 Chemistry

Which of the following best explains why phenol reacts with aqueous NaOH, but alcohols do not?

- A. Phenol has a lower boiling point than alcohol.
- B. Alcohols contain a strong O-H bond that cannot be broken by weak bases.
- C. Phenol form hydrogen bonding that facilitates ionization.
- D. Phenol is weakly acidic due to resonance stabilization of phenoxide ion. ✓

  Correct answer

A. Boiling point does not determine acid–base reaction with NaOH; phenol in fact boils higher than simple alcohols.

B. The O–H bond is not the distinguishing feature; alcohols fail to react because their alkoxide ions are not stabilised, not because the bond is unbreakable in principle.

C. Hydrogen bonding does not explain phenol's acidity; resonance does.

D. The phenoxide ion's negative charge is delocalised into the benzene ring, making phenol acidic enough to react with NaOH, while alkoxides lack this stabilisation; correct.

Question Q82 Chemistry

In propene pi-bond is formed by sideway overlap of:

bitals

- B. p-orbitals ✓ **Correct answer**
- C. sp2 hybrid orbitals
- D. sp3 hybrid orbitals

A. s–s overlap gives a sigma bond, not a pi bond.

B. A pi bond forms by sideways (lateral) overlap of unhybridised p orbitals; correct.

C. sp^2 hybrids form the sigma framework of propene (including the C=C sigma bond), not the pi bond.

D. sp^3 hybrids form single (sigma) bonds only, as in alkanes.

Question Q83 Biology

An enzyme used to decompose the lipids into fatty acids in our alimentary canal is

- A. Amylase
- B. Protease
- C. Lipase ✓ **Correct answer**
- D. Urease

A. Digests starch to sugars, not lipids.

B. Digests proteins to peptides/amino acids.

C. Hydrolyses triglycerides into fatty acids and glycerol in the gut; correct.

D. Acts on urea (not a human digestive enzyme for lipids). NOTE: the page tags this question Biology although it sits inside the Chemistry block; it is kept under its page tag (see subject-order note).

Question Q84 Chemistry

Molecules having one lone pair and three bond pairs have geometrical shape

t or angular

- B. Trigonal
- C. Trigonal pyramidal ✓ **Correct answer**
- D. Trigonal planer

A. The shape for two bond pairs with lone pairs (e.g. H_2O, AX_2E_2), not three bond pairs.

B. Incomplete: "trigonal planar" needs three bond pairs and NO lone pair; the lone pair changes the shape.

C. AX_3E (three bond pairs + one lone pair, e.g. NH_3) is trigonal pyramidal by VSEPR; correct.

D. Trigonal planar (spelled "planar") is AX_3 with no lone pair (e.g. BF_3).

Question Q85 Chemistry

Conversion of dihaloalkane into alkyne does not involve

- A. Addition ✓ **Correct answer**
- B. Elimination
- C. Base
- D. Heat

A. Converting a dihalide to an alkyne removes HX twice; addition (adding across a multiple bond) is the opposite process and is not involved; correct as the exception.

B. The conversion IS two successive dehydrohalogenation (elimination) steps.

C. A strong base (e.g. $NaNH_2$ or alcoholic KOH) is required to remove the hydrogens.

D. Strong heating is typically needed for the second elimination.

Question Q86 Chemistry

Majority of reactions taking place at ordinary temperatures with -ΔH are

- A. Endothermic

thermic ✓ **Correct answer**

- C. Thermally unstable
- D. Reversible

A. Endothermic reactions have POSITIVE ΔH (heat absorbed); the stem's "-ΔH" denotes a negative ΔH.

B. A negative ΔH means heat is released to the surroundings: exothermic; correct.

C. A statement about stability/decomposition, not about the sign of ΔH.

D. Reversibility is about equilibrium, not about whether ΔH is negative. NOTE: the stem prints "-ΔH"; it is read as ΔH < 0.

Question Q87 Chemistry

Which one of the following is a coinage metal

- A. Pd
- B. Cu ✓ **Correct answer**
- C. Cd
- D. Hg

A. Palladium is a platinum-group metal, not a coinage metal.

B. Copper is one of the classical coinage metals (Cu, Ag, Au), long used for coins; correct.

C. Cadmium is a group-12 metal, not a coinage metal.

D. Mercury is a liquid group-12 metal, not a coinage metal.

Question Q88 Chemistry

Consider the given balanced chemical equation: 2H2 + O2 -> 2H2O If 4 g of H2 reacts with 32 g of O2 to produce 28 g of H2O, what is the percentage yield of the reaction? (Molar mass of H2 = 2 g/mol, O2 = 32 g/mol and H2O = 18 g/mol)

- B. 77.8% ✓ **Correct answer**
- C. 87.5%
- D. 92.5%

A. Does not match the stoichiometry: it is not 28/44 or any correct ratio here.

B. 4 g H_2 = 2 mol and 32 g O_2 = 1 mol react exactly to give 2 mol H_2O = 36 g theoretical; 28/36 × 100 = 77.8%; correct.

C. 28/32, i.e. dividing by the oxygen mass instead of the theoretical water mass; wrong.

D. No correct combination of the given masses gives this figure.

Question Q89 Chemistry

Amount of energy needed to weaken the existing bonds to an extent that can be broken through collision is called:

- A. Bond energy
- B. Activation energy ✓ **Correct answer**
- C. Average energy
- D. Enthalpy

A. The energy to break one specific bond completely in isolation, not the collision barrier to reach the transition state.

B. The minimum extra energy colliding molecules need to reach the transition state so bonds can break and form; correct.

C. Not a standard term for this barrier.

D. A state function giving the overall heat change of the reaction, not the energy barrier.

Q90 Chemistry

Which set of quantum numbers is not allowed for an electron.

- A. n=2, l=1, m=0, s=+1/2
- B. n=3, l=0, m=0, s=-1/2
- C. n=2, l=2, m=+1, s=+1/2 ✓ **Correct answer**
- D. n=1, l=0, m=0, s=+1/2

A. Allowed: l = 1 < n = 2, m within −l…+l, spin ±½.

B. Allowed: an s electron in n = 3.

C. Not allowed: l must be 0 ≤ l ≤ n−1, so for n = 2, l = 2 is impossible; correct as the disallowed set.

D. Allowed: the 1s electron.

Question Q91 Chemistry

2A + B -> 3C + D which of the following does not express the reaction rate?

- A. -d[B]/dt
- B. d[D]/dt
- C. -1/2 d[A]/dt
- D. -1/3 d[C]/dt ✓ **Correct answer**

A. Correct rate form: B is consumed, so its rate of disappearance (with the minus sign and coefficient 1) equals the rate.

B. Correct: D is produced with coefficient 1.

C. Correct: A is consumed with coefficient 2, so rate = −(1/2)d[A]/dt.

D. Wrong sign: C is produced, so the rate is +(1/3)d[C]/dt; the negative sign makes this expression incorrect; correct as the one that does NOT express the rate.

Q92 Chemistry

Acetaldehyde undergoes oxidation to produce acetic acid, In this reaction oxidizing agent used is:

- A. HI
- B. LiAlH4
- C. K2Cr2O7 ✓ **Correct answer**
- D. NaBH4

A. A reducing agent (and acid), not an oxidant for aldehydes.

B. A strong reducing agent; it would reduce, not oxidise, the aldehyde.

C. Potassium dichromate, a Cr(VI) oxidising agent that oxidises aldehydes to carboxylic acids; correct.

D. A reducing agent (reduces aldehydes to alcohols), the opposite of what is needed.

Question Q93 Chemistry

Which one of the following has higher vapour pressure?

- A. acetone
- B. acetaldehyde ✓ **Correct answer**
- C. isopentane
- D. Benzene

A. Boiling point ~56 °C; lower vapour pressure than acetaldehyde at the same temperature.

B. Boiling point ~20 °C, the lowest of the four, so at a given temperature it has the highest vapour pressure; correct.

C. Boiling point ~28 °C, higher than acetaldehyde, so lower vapour pressure.

D. Boiling point ~80 °C, the highest here, so the lowest vapour pressure.

Q94 Chemistry

Terminal alkynes show acidic character due to:

- A. Terminal carbon atoms are sp hybridized. ✓ **Correct answer**
- B. Terminal carbon atoms are sp2 hybridized.
- C. Terminal carbon atoms are sp3 hybridized.
- D. Terminal carbon atoms show hydrogen bonding.

A. sp carbon has 50% s-character, holding the electron pair close to the nucleus and stabilising the acetylide anion, so the terminal C–H is acidic; correct.

B. sp^2 (alkenes) has less s-character and the C–H is far less acidic.

C. sp^3 (alkanes) has the least s-character and essentially non-acidic C–H bonds.

D. Hydrogen bonding does not cause the acidity of terminal alkynes.

Question Q95 (printed 99) Chemistry

Q99. Fischer ESTERIFICATION Is which type of reaction:

- A. Condensation ✓ **Correct answer**
- B. Substitution
- C. Elimination
- D. Dehydrogenation

A. Fischer esterification joins a carboxylic acid and an alcohol with loss of water, the defining feature of a condensation reaction; correct.

B. Although the –OH is replaced, the classification asked for is the water-losing condensation; substitution alone misses the defining loss of water.

C. Elimination removes atoms to form a multiple bond; no C=C or C≡C is formed here.

D. Removes hydrogen (usually H_2) to increase unsaturation; not what happens in esterification.

Q96 (printed 100) Chemistry

Q100. Shape of orbital is determined by quantum number:

- A. n
- B. l ✓ **Correct answer**
- C. m
- D. s

A. The principal quantum number sets the size and energy level (shell), not the shape.

B. The azimuthal (angular-momentum) quantum number determines orbital shape: l = 0, 1, 2, 3 give s, p, d, f shapes; correct.

C. The magnetic quantum number sets orientation in space, not shape.

D. The spin quantum number describes the electron's spin, not orbital shape.

Question Q98 (printed 103) Chemistry

Q103. Final equation for the representation of rate of reaction in term of concentration is called

- A. Rate law ✓ **Correct answer**
- B. Rate constant
- C. Reaction rate
- D. Reaction order

A. The equation expressing rate as a function of concentrations (rate = $k[A]^m[B]^n$); correct.

B. k, a single parameter inside the rate law, not the equation itself.

C. The measured speed of the reaction, not the equation relating it to concentration.

D. The exponents in the rate law, part of the equation, not the whole equation. NOTE: printed number 103 skips 102 (see numbering note).

Q100 (printed 105) Chemistry

Q105. Which of the following is true about pressure for an ideal gas at -273°C?

- A. P=1atm
- B. P=2atm
- C. P=3atm
- D. P=0 atm ✓ **Correct answer**

A. No fixed pressure of 1 atm follows from the temperature alone.

B. No basis in the ideal-gas law at this temperature.

C. No basis either.

D. −273 °C is absolute zero (0 K); for an ideal gas P ∝ T at fixed volume, so the pressure extrapolates to zero; correct (as an ideal-gas limit).

Question Q101 (printed 106) Chemistry

Q106. Which of the following is basic buffer?

- A. NH4OH/NH4Cl ✓ **Correct answer**
- B. NaOH/NaCl
- C. NaOH/HCl
- D. H2CO3/NaHCO3

A. A weak base (ammonia in water) with its conjugate salt: a basic buffer; correct.

B. A strong base with its salt; not a buffer system at all.

C. A strong base and strong acid; they neutralise each other, forming no buffer.

D. A weak ACID with its salt: an acidic (carbonic) buffer, not a basic one.

Q102 (printed 107) Chemistry

Q107. What happens when H+ is added to ammonium hydroxide and ammonium chloride buffer?

- A. more ammonium hydroxide is formed
- B. reaction will move reverse
- C. reaction will move forward ✓ **Correct answer**
- D. no effect on equilibrium

A. Adding H^+ consumes OH^- and forms NH_4^+ from NH_3; it does not produce more NH_4OH (ammonia in water) as such.

B. Wrong: this is the filed key, corrected 8 Nov 2026. It follows only the alternative framing ($NH_4^+ \rightleftharpoons NH_3 + H^+$, added H^+ shifts it left); the standard textbook treatment of this buffer writes the equilibrium as $NH_4OH \rightleftharpoons NH_4^+ + OH^-$.

C. Correct: on the standard $NH_4OH \rightleftharpoons NH_4^+ + OH^-$ equilibrium, added H^+ consumes OH^- (forming water), so the dissociation runs forward; the signed official UHS key gives Paper ID-D Q107 = C, and three textbook treatments agree (Class 11 slides: "the equilibrium 1 shifts in forward direction"; Scribd buffer notes: "shifted towards right side"; "shift the equilibrium above to the right as H+ added combine with OH- to form H2O"). KEY CORRECTED B → C — decided by assistant under the owner's 8 Nov 2026 delegation (official key + three textbook treatments against the filed answer; the filed B survives only on the alternative equation-writing).

D. False: added H^+ is consumed by the buffer, so the equilibrium position changes.

Note: FILE CORRECTION: the filed key B ("reaction will move reverse") was corrected to C ("reaction will move forward") 8 Nov 2026 per the signed official UHS key (Paper ID-D Q107 = C) + three textbook treatments of the NH4OH/NH4Cl buffer; the filed B survives only on the alternative NH4+ framing. Decided by assistant under the owner's 8 Nov 2026 delegation.

Q103 (printed 108) Chemistry

Q108. What is general requirement for free radical substitution reaction of ethane and halogen?

- A. low pressure
- B. low temperature
- C. high pressure
- D. heat and UV light ✓ **Correct answer**

A. Pressure is not the defining initiation condition for radical halogenation.

B. Low temperature would slow initiation; heat is needed instead.

C. Not the general requirement.

D. Heat or UV light provides the energy to split the halogen molecule into radicals, initiating the chain reaction; correct.

Question Q104 (printed 109) Chemistry

Q109. Which one of the following is not a characteristic of benzene?

- A. Aromaticity
- B. Stability
- C. to follow Huckle rule
- D. High reactivity ✓ **Correct answer**

A. Benzene is the archetypal aromatic compound; a genuine characteristic.

B. Benzene has extra resonance stabilisation; a genuine characteristic.

C. Benzene follows Hückel's rule (4n+2 π electrons, n = 1); a genuine characteristic (stem prints "Huckle" for Hückel).

D. Benzene is relatively UNREACTIVE compared with alkenes: it undergoes substitution rather than addition, precisely because of its stability; correct as the non-characteristic.

Q105 (printed 110) Chemistry

Q110. Correct arrangement of orbital according to size of hybridized orbitals?

- A. sp>sp2>sp3
- B. sp3> sp> sp2
- C. sp2>sp>sp3
- D. sp3>sp2>sp ✓ **Correct answer**

A. Reversed: sp is the smallest, not the largest.

B. Puts sp^2 smallest, which is wrong.

C. Puts sp^3 smallest, which is wrong.

D. More p-character means a larger, more diffuse orbital: sp^3 (75% p) > sp^2 (67% p) > sp (50% p); correct.

Question Q106 Chemistry

Consider the equation H2 + O2 -> H2O, what volume of hydrogen gas is required to produce 1 mol of water at standard temperature & pressure?

- A. 11.2 dm3
- B. 22.4 dm3 ✓ **Correct answer**
- C. 10 dm3
- D. 58 dm3

A. Half a mole of gas at STP; the stoichiometry needs a full mole of H_2 per mole of water.

B. Balanced: $2H_2 + O_2 \rightarrow 2H_2O$, so 1 mol H_2O needs 1 mol H_2, which occupies 22.4 dm^3 at STP; correct.

C. No stoichiometric basis.

D. No stoichiometric basis.

Q107 Chemistry

A chemical reaction has a theoretical yield of 25 g, but only 20 g of product was obtained. What is the percentage yield of the reaction?

- A. 20%
- B. 25%
- C. 45%
- D. 80% ✓ **Correct answer**

A. 20 is the actual yield in grams, not the percentage.

B. 25 is the theoretical yield in grams, not the percentage.

C. 20 + 25, an addition with no meaning here.

D. (20/25) × 100 = 80%; correct.

Question Q108 Chemistry

Which of the following situations most clearly demonstrates a key characteristic of a Redox reaction?

- A. Water boiling to steam
- B. Hydrogen gas reacting with chlorine to form hydrogen chloride gas ✓ **Correct answer**
- C. Sodium chloride dissolving in water
- D. Ethanol evaporating at room temperature

A. A physical change; no electron transfer, no oxidation-state change.

B. H is oxidised (0 → +1) and Cl reduced (0 → −1): electron transfer, the defining feature of redox; correct.

C. Dissociation into ions already present; no change in oxidation states.

D. A physical change; no redox.

Q109 Chemistry

If 100 KJ of heat is absorbed by the system and 40 KJ of work is done on the system what is the change of Internal energy?

- A. -60 KJ
- B. +60 KJ
- C. -140 KJ
- D. +140 KJ ✓ **Correct answer**

A. 100 − 40 with the wrong sign for work: work done ON the system adds energy.

B. 100 − 40; treats the work as done BY the system.

C. Both terms given the wrong sign.

D. First law, ΔU = Q + W (chemistry sign convention): Q = +100 kJ absorbed, W = +40 kJ done on the system, so ΔU = +140 kJ; correct.

Question Q110 Chemistry

Number of unpaired electrons present in the ground state of Fe3+ are (Atomic number of Fe=26).

- A. Three
- B. Four
- C. Five ✓ **Correct answer**
- D. Six

A. Too few: Fe^{3+} has five d electrons, all unpaired in the ground state.

B. Would require one paired d electron, which does not occur for $3d^5$ in the ground state.

C. Fe (Z = 26) is [Ar] $3d^6 4s^2$; Fe^{3+} loses the 4s electrons and one 3d electron, leaving $3d^5$ with one electron in each d orbital, all unpaired; correct.

D. Fe^{3+} has only five 3d electrons, six unpaired electrons is impossible.

Q111 Chemistry

If % yield and actual yield is 80 and 20g respectively, what will be theoretical yield?

- A. 20g
- B. 25g ✓ **Correct answer**
- C. 30g
- D. 40g

A. That is the actual yield, not the theoretical yield.

B. Theoretical = actual ÷ (yield/100) = 20 ÷ 0.80 = 25 g; correct.

C. Would give a 66.7% yield, not 80%.

D. Would give a 50% yield, not 80%.

Question Q112 Chemistry

Which of the following best identifies the redox reaction:

- A. transfer of proton
- B. transfer of electron ✓ **Correct answer**
- C. absorption of light
- D. exchange of ions

A. Proton transfer defines acid–base reactions, not redox.

B. Oxidation is loss and reduction is gain of electrons; electron transfer is the defining feature of redox; correct.

C. A photochemical trigger, not the definition of redox.

D. Ion exchange (e.g. precipitation, double displacement) involves no oxidation-state change.

Q113 Chemistry

Methanol is produced by reduction of

- A. Formaldehyde ✓ **Correct answer**
- B. Acetaldehyde
- C. Propanal
- D. Propanone

A. Reducing HCHO (methanal) by adding hydrogen gives CH_3OH, methanol; correct.

B. Reduction gives ethanol, not methanol.

C. Reduction gives propan-1-ol.

D. A ketone; reduction gives propan-2-ol.

Question Q114 Chemistry

IUPAC name of (CH3)3 CCH2 Br is

- A. 1-bromopentane
- B. 1-bromo-2,2,2-trimethylethane
- C. 1-bromo-2,2-dimethylpropane ✓ **Correct answer**
- D. 2-bromopentane

A. A straight five-carbon chain with Br at C-1; the given structure is branched, not a pentane chain.

B. Wrong parent: ethane cannot carry three methyl substituents at C-2 (that would exceed carbon's valency as named).

C. The longest chain is propane with two methyl groups on C-2 and Br on C-1 (neopentyl bromide); correct.

D. Wrong skeleton and wrong Br position.

Which one shows anisotropic behavior?

- A. Wood
- B. Gemstone
- C. Coke
- D. Graphite ✓ **Correct answer**

A. Wood IS also anisotropic (properties differ along and across the grain), so this is a genuine anisotropic material; the keyed answer rests on graphite being the intended textbook example, not on wood being isotropic.

B. Most gemstones are crystalline and can be anisotropic, but "gemstone" is not a single material and is not the standard example.

C. An amorphous/porous carbon material, essentially isotropic.

D. Strongly anisotropic: conductivity and strength differ greatly parallel vs perpendicular to its layers; the intended standard example; the signed official key confirms D. NOTE: option A (wood) IS also anisotropic in the materials-science usage (properties differ along and across the grain), and most gemstones are crystalline and can be anisotropic; graphite is the keyed crystalline-solids example and the signed official key gives Q120 = D. PROMOTED to VERIFIED — 8 Nov 2026 push under the owner's verification standard (one source is FINAL), with this caveat kept prominent.

Question Q116 (printed 121) Chemistry

Q121. In a unit cell of a crystal lattice the angle β is between faces:

- A. a and b
- B. b and c
- C. c and a ✓ **Correct answer**
- D. not specified

between the a and b axes is γ (gamma), not β.

B. The angle between b and c is α (alpha).

C. By crystallographic convention β is the interaxial angle between a and c; correct.

D. It is specified by convention; this option evades the question. NOTE: the page prints each option with a duplicated inner letter ("a) a and b" etc.); the inner letters are stripped here and the options rendered A–D.

Question Q118 (printed 123) Chemistry

Q123. Number of unpaired electrons In Boron in ground state is/are:

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

A. Boron (Z = 5) is $1s^2 2s^2 2p^1$: the single 2p electron is unpaired; correct.

B. Would require two singly-occupied orbitals; boron has only one p electron.

C. Boron's three valence electrons, but two are paired in 2s; only one is unpaired.

D. More unpaired electrons than boron has valence electrons in p orbitals.

Question Q119 (printed 124) Chemistry

Q124. Chlorination of benzene in the presence of Iron (III) chloride involves mechanism of:

- A. Electrophilic addition
- B. Electrophilic Substitution ✓ **Correct answer**
- C. Free radical Substitution
- D. Free radical halogenation

across a double bond would destroy aromaticity; benzene does not chlorinate this way.

B. $FeCl_3$ generates Cl^+, which substitutes a ring hydrogen: electrophilic aromatic substitution; correct.

C. The mechanism for side-chain/alkane halogenation under UV light, not ring chlorination with $FeCl_3$.

D. Same radical pathway as C; not the $FeCl_3$ aromatic mechanism.

Question Q120 (printed 125) Chemistry

Q125. The element with smallest value of ionization energy is

- A. Li
- B. Al
- C. Ca
- D. Ba ✓ **Correct answer**

A. Smallest atom of the four; its outer electron is held most tightly, giving the highest ionisation energy here.

B. Higher ionisation energy than Ca or Ba; a smaller, period-3 atom.

C. Lower than Li and Al, but higher than Ba (Ba is further down the group, larger, with more shielding).

D. Largest atom, outermost electron furthest from the nucleus and most shielded, so the smallest first ionisation energy; correct.

Question Q121 (printed 126) Chemistry

Q126. Carboxylic acid reacts with ammonia to form ammonium salts which on heating produces:

- B. Alkane
- C. Ester
- D. Amide ✓ **Correct answer**

A. Formed from CO_2 and bases, not by heating ammonium carboxylates.

B. No decarboxylation to an alkane occurs under these conditions.

C. Esters come from carboxylic acids + alcohols, not from ammonia salts.

D. Heating an ammonium carboxylate dehydrates it to the corresponding amide ($RCONH_2$); correct.

Question Q122 (printed 127) Physics

Q127. If P is the momentum of an object and m is its mass, then its kinetic energy is:

- A. P/2m
- B. P^2/2m ✓ **Correct answer**
- C. 1/2 Pm^2
- D. 1/2 P^2/m^2

A. Dimensionally wrong (momentum/mass is a velocity, not an energy) and missing the square.

B. From KE = ½mv² and p = mv: KE = p²/2m; correct.

C. Wrong dimensions and wrong dependence on mass.

D. That equals ½v², an energy per unit mass, not the kinetic energy.

Question Q123 (printed 128) Physics

Q128. The electric field at a point due to two equal and opposite charges is 100 N/C. If the magnitude of each charge is doubled then the electric field at that point becomes:

- B. 100 N/C
- C. 200 N/C ✓ **Correct answer**
- D. 400 N/C

A. Halving would require the charges to halve, not double.

B. Unchanged field would require unchanged charges.

C. Field is proportional to charge (superposition of two fields, each doubling); 100 × 2 = 200 N/C; correct.

D. Quadrupling would require the field to scale as charge squared; it scales linearly.

Question Q124 (printed 129) Physics

Q129. If a plastic sheet of relative permittivity 2.5 is inserted between two-point charges placed in vacuum, then the electrostatic force between them:

- A. Increases by a factor of 2.5
- B. Decreases by a factor of 2.5 ✓ **Correct answer**
- C. Increases by a factor of 5
- D. Decreases by a factor of 5

A. A dielectric weakens, never strengthens, the force between free charges.

B. $F_{medium} = F_{vacuum}/\varepsilon_r = F/2.5$; correct.

C. Wrong direction and wrong factor.

D. Wrong factor: the reduction factor is $\varepsilon_r = 2.5$, not 5.

Question Q125 (printed 130) Physics

Q130. After 3 half-lives, the remaining fraction of a radioactive sample is:

- A. 1/2

- C. 1/8 ✓ **Correct answer**
- D. 1/16

A. The fraction after ONE half-life.

B. The fraction after TWO half-lives.

C. After n half-lives $(1/2)^n$ remains; $(1/2)^3 = 1/8$; correct.

D. The fraction after FOUR half-lives.

Question Q126 (printed 131) Physics

Q131. If the horizontal range of a projectile becomes half of its maximum possible horizontal range, the probable angle of projection is;

- A. 15° ✓ **Correct answer**
- B. 30°
- C. 45°
- D. 60°

A. Range ∝ sin 2θ; half the maximum needs sin 2θ = ½, so 2θ = 30° (or 150°), θ = 15° (or 75°); 15° is the listed solution; correct.

B. sin 60° = 0.866, giving 86.6% of maximum range, not half.

C. Gives the MAXIMUM range, not half of it.

D. sin 120° = 0.866, again 86.6% of maximum.

Question Q127 (printed 132) Physics

Q132. In an ideal transformer, if the primary voltage is doubled and the turns ratio remains the same, what happens to the secondary current?

- A. Doubles ✓ **Correct answer**

- C. Remains the same
- D. Becomes four times

A. With fixed turns ratio the secondary voltage doubles; for a fixed load impedance the secondary current (V/R) doubles; correct under that fixed-load reading.

B. That would follow if secondary power were held fixed with no load change, which is not the stated setup.

C. Only if the load impedance also doubled, which is not stated.

D. No squaring applies: voltage and current scale linearly here.

Question Q128 (printed 133) Physics

Q133. An angular displacement of 90° is equal to:

- A. One-fourth revolution ✓ **Correct answer**
- B. One- third revolution
- C. One half revolution
- D. One complete revolution

A. 90°/360° = 1/4 of a full turn; correct.

B. One-third of a revolution is 120°, not 90°.

C. Half a revolution is 180°.

D. A full revolution is 360°.

Question Q129 (printed 134) Physics

Q134. The time in which half of the given number of radioactive nuclei decay is known as

- A. 1/2 life of radioactive element. ✓ **Correct answer**
- B. 2/3 life of radioactive element.

life of radioactive element.

- D. 2/5 life of radioactive element.

A. The definition of half-life, stated directly (the standard term is "half-life"); correct.

B. No such standard term; two-thirds decay is not the definition.

C. The time for three-quarters to decay, not half.

D. No such standard term.

Question Q130 (printed 135) Physics

Q135. Earth receives large amount of energy directly from:

- A. Wind
- B. Water
- C. Sun ✓ **Correct answer**
- D. Moon

A. Wind energy itself comes from solar heating; it is not an independent direct source of Earth's energy.

B. Hydropower and ocean currents are driven ultimately by solar energy and gravity, not a direct source.

C. Solar radiation is by far the dominant direct energy input to Earth; correct.

D. The Moon reflects a tiny amount of sunlight and raises tides; negligible as an energy source.

Question Q131 (printed 136) Physics

Q136. A phase difference of 90° is equal to:

- A. π radians
- B. π/2 radians ✓ **Correct answer**

- D. π/4 radians

A. That is 180°, double the angle asked.

B. 90° × (π/180) = π/2; correct.

C. A full 360°.

D. That is 45°, half the angle asked.

Question Q132 (printed 137) Physics

Q137. The reciprocal of the resistivity of a material is called its:

- A. impedance
- B. conductivity ✓ **Correct answer**
- C. admittance
- D. reactance

A. Total opposition to AC current (resistance + reactance), not the reciprocal of resistivity.

B. σ = 1/ρ, measuring how well a material conducts; correct.

C. The reciprocal of impedance in AC circuits, not of resistivity.

D. Opposition from inductance/capacitance in AC circuits, not the reciprocal of resistivity.

Question Q133 (printed 138) Physics

Q138. The Balmer series of hydrogen spectrum appears in the

- A. Infrared region
- B. Ultraviolet region
- C. X-ray region
- D. Visible region ✓ **Correct answer**

en series (and beyond) lies in the infrared.

B. The Lyman series lies in the ultraviolet.

C. Far too energetic for Balmer transitions.

D. Balmer transitions (to n = 2) emit visible light; correct.

Question Q134 (printed 139) Physics

Q139. A ball is thrown into the air with certain velocity v making an angle θ with horizontal. If air resistance is neglected, then at maximum height its velocity is:

- A. Equal to initial velocity
- B. Half of initial velocity
- C. Equal to zero
- D. Minimum but not zero ✓ **Correct answer**

A. The speed falls as the ball rises (vertical component shrinks); it equals the launch speed only again on landing.

B. True only for one special launch angle (cos θ = ½); not general.

C. The vertical component is zero at the top, but the horizontal component (v cos θ) remains.

D. At maximum height the speed is at its trajectory minimum, equal to the (non-zero, unless thrown vertically) horizontal component; correct.

Question Q135 (printed 140) Physics

Q140. A canon is placed on a smooth surface. When it fires a shell, the canon moves backward, this recoil occurs due to:

- A. law of conservation of energy
- B. Backward thrust of the gases

wton's third law of motion ✓ **Correct answer**

- D. Newton's first law of motion

A. Energy is conserved, but recoil is a momentum/action–reaction phenomenon; energy conservation alone does not explain the backward motion.

B. The gases do push the cannon back, but the governing principle asked for is the action–reaction law; "thrust" is the mechanism, not the law.

C. The forward force on the shell has an equal and opposite force on the cannon, causing recoil; correct.

D. Inertia alone does not explain why the cannon gains backward velocity. NOTE: the stem prints "canon" for cannon.

Question Q136 (printed 141) Physics

Q141. If the surface charge density of an infinite sheet increases by 25%, the electric field intensity:

- A. Increases by 25% ✓ **Correct answer**
- B. Increases by 50%
- C. Decreases by 25%
- D. Remains the same

A. For an infinite sheet $E = \sigma/2\varepsilon_0$, directly proportional to σ; +25% in σ gives +25% in E; correct.

B. Would require σ to increase by 50% or E to scale as σ^2.

C. Wrong direction: more charge means a stronger field.

D. E depends on σ; it cannot stay the same when σ changes.

Q137 (printed 142) Physics

Q142. An incompressible fluid flows through a pipe that becomes narrower in one section. The fluid speed in that region increases in that region to maintain:

- A. Constant pressure
- B. constant energy
- C. constant mass flow rate ✓ **Correct answer**
- D. constant volume

A. Pressure actually FALLS in the narrow section (Bernoulli); it is not what is maintained.

B. Energy considerations (Bernoulli) relate pressure and speed, but the speed increase itself follows from continuity.

C. Continuity: for incompressible flow ρAv is constant, so smaller area means higher speed to keep the same mass passing per second; correct.

D. Volume flow rate is also constant for incompressible flow, but the conserved quantity the question names is mass flow rate; "constant volume" alone does not state the continuity condition (and volume is not conserved in general for compressible flow).

Question Q138 (printed 143) Physics

Q143. In a pipe of varying cross-section as fluid enters the narrower region, it exhibits:

- A. high velocity, high pressure
- B. high velocity, low pressure ✓ **Correct answer**
- C. low velocity, high pressure
- D. low velocity, low pressure

A. Contradicts Bernoulli: faster flow means lower static pressure.

B. Continuity raises the speed in the narrow section and Bernoulli's principle lowers the pressure there; correct.

section behaviour, not the narrow section.

D. Combines the wrong speed with the right pressure trend.

Question Q139 (printed 144) Physics

Q144. The curved shape of an airplane wing causes air to move faster over the top surface. This leads to:

- A. greater pressure on the top
- B. lower pressure on the top ✓ **Correct answer**
- C. equal pressure on both sides
- D. zero pressure above the wing

A. Faster flow gives lower, not greater, pressure (Bernoulli); greater top pressure would push the wing down.

B. Faster air over the top means lower pressure there than underneath, producing lift; correct.

C. Equal pressure would give no lift.

D. Pressure drops but never to zero above a wing in normal flight.

Question Q141 (printed 146) Physics

Q146. Mechanical waves cannot travel through outer space because they:

- A. have low speed in vacuum
- B. disperse in space due to long wavelength
- C. lose frequency in the absence of air
- D. lose transmission without interacting particles ✓ **Correct answer**

A. Mechanical waves do not have a speed in vacuum at all; they cannot propagate there.

B. Dispersion is not the reason; wavelength does not prevent propagation.

v is set by the source and is not lost in the absence of a medium; there is simply no medium to carry the disturbance.

D. Mechanical waves need a material medium of interacting particles to transmit the disturbance; outer space has essentially none; correct.

Question Q142 (printed 147) Physics

Q147. Terminal voltage of a cell equals its EMF only when:

- A. No current flows ✓ **Correct answer**
- B. Current is maximum
- C. Internal resistance is infinite
- D. Load resistance is zero

A. V = E − Ir; with I = 0 there is no internal drop and V = E; correct.

B. Maximum current gives the LARGEST internal drop, so V is furthest below E.

C. An infinite internal resistance would block all current; it is not the condition for V = E.

D. A short circuit: current is maximum and terminal voltage collapses toward zero.

Question Q143 (printed 148) Physics

Q148. A loop moves toward a stationary magnet. The induced current will:

- A. enhance the motion
- B. try to stop the approach ✓ **Correct answer**
- C. become zero
- D. become alternating

A. Lenz's law says the induced effect OPPOSES the change; it never enhances the approach.

B. The induced current creates a field repelling the approaching magnet, opposing the

ux, correct.

C. A changing flux is present while the loop approaches, so an induced current flows; it is not zero.

D. The current is in one direction during the steady approach; it does not alternate.

Question Q144 (printed 149) Physics

Q149. The energy of a Simple Harmonic oscillation depends upon the:

- A. frequency
- B. time period
- C. wavelength
- D. amplitude ✓ **Correct answer**

A. For a given oscillator the frequency is fixed by its mass and stiffness; in the energy relation $E = \frac{1}{2}kA^2$ the variable that determines the energy is the amplitude, not a freely varied frequency.

B. The period is the reciprocal of the frequency, likewise a fixed property of the oscillator, not the quantity the energy varies with.

C. Wavelength is not a parameter of a simple harmonic oscillator (it belongs to travelling waves).

D. $E \propto A^2$: for the oscillator as given, the total energy is determined by the amplitude; correct as the keyed answer.

Question Q145 (printed 150) Physics

Q150. The wave that has the highest frequency & penetrating power is:

- A. X-rays
- B. Ultraviolet rays
- C. Gamma rays ✓ **Correct answer**

A. Very high frequency and penetrating, but below gamma rays in both.

B. Higher frequency than visible light, but far below X-rays and gamma rays.

C. The highest-frequency, most penetrating waves in the electromagnetic spectrum; correct.

D. Low frequency, low penetrating power compared with the others.

Question Q146 (printed 151) Physics

Q151. According to First law of thermodynamics when heat flows into a system and no work is done the internal energy of the system must

- A. Increase ✓ **Correct answer**
- B. Decrease
- C. Remains constant
- D. Becomes zero

A. $\Delta U = Q - W$ (physics convention): $Q > 0$ in, $W = 0$, so $\Delta U > 0$; correct.

B. Energy would decrease only if heat left or work were done by the system.

C. Only if the heat inflow were exactly balanced by work done, which is excluded.

D. Internal energy increases from its starting value; it does not become zero.

Question Q147 (printed 152) Physics

Q152. If the length of the conductor is made 4 times its original length, its resistance becomes

- A. quarter
- B. half
- C. zero

nes ✓ Correct answer

A. Resistance rises with length, it does not fall; a quarter would follow from length ÷ 4.

B. Same error in the other direction.

C. Resistance cannot vanish by lengthening a conductor.

D. R = ρL/A: with resistivity and cross-section unchanged, R ∝ L, so 4× length gives 4× resistance; correct.

Question Q148 (printed 153) Physics

Q153. The unit of temperature coefficient of resistivity is

- A. 1/C
- B. 1/K ✓ **Correct answer**
- C. 1/A
- D. 1/Ω

A. Per degree Celsius: numerically equal to per kelvin for temperature DIFFERENCES, but the SI unit asked for is per kelvin; the keyed answer is B.

B. The temperature coefficient α = (1/ρ)(dρ/dT) has units of reciprocal temperature, K^{-1}; correct.

C. Per ampere, a current unit; irrelevant.

D. Per ohm, the unit of conductance; not a temperature coefficient.

Question Q149 (printed 154) Physics

Q154. The work done by the gravitational force on an object as it moves from a reference level to a higher point is

- A. Always positive
- B. Always negative ✓ **Correct answer**

- D. Depends on the path taken

A. Gravity opposes upward motion, so its work is negative, not positive.

B. Moving upward, displacement is opposite to the gravitational force, so $W = -mgh < 0$; correct.

C. Work is zero only for horizontal motion (force perpendicular to displacement).

D. Gravity is conservative: its work depends only on the height difference, not the path.

Question Q150 (printed 155) Physics

Q155. If two speakers emit sound at same frequency and phase, maximum loudness occurs when:

- A. Path difference = √2
- B. Path difference = λ ✓ **Correct answer**
- C. Path difference = λ/4
- D. Path difference = 3λ/43

A. A bare number with no wavelength unit; it is not a constructive-interference condition.

B. Constructive interference needs path difference = nλ; λ (n = 1) is the listed case; correct.

C. A quarter wavelength gives neither full constructive nor full destructive interference.

D. As printed ("3λ/43") this is a garbled value, presumably meant to be 3λ/4 (destructive-ish/odd multiple of λ/2 would be 3λ/2); in any case it is not the constructive condition. NOTE: option D is reproduced as printed.

Question Q151 (printed 157) Physics

Q157. A 0.5 kg ball moving at 6 m/s has kinetic energy

- A. 9 J ✓ **Correct answer**

- C. 6 J
- D. 3 J

A. KE = ½mv² = ½ × 0.5 × 36 = 9 J; correct.

B. That is mv² without the half (or ½ × 1 kg × 36).

C. No correct combination of 0.5 and 6 gives 6 J.

D. A third of the correct value; no basis. NOTE: printed number 157 skips 156 (see numbering note).

Question Q152 (printed 158) Physics

Q158. A fluid is flowing through a tube, to undergo transition from laminar to turbulent flow it's velocity must be:

- A. Slightly less than critical velocity
- B. equal to critical velocity
- C. greater than critical velocity ✓ **Correct answer**
- D. increasing gradually but less than critical velocity

A. Below the critical velocity the flow stays laminar.

B. At the critical velocity the flow is at the transition point; transition to turbulence requires exceeding it.

C. Above the critical velocity (critical Reynolds number) flow becomes turbulent; correct.

D. Still laminar, however gradually it rises, while it stays below critical.

Question Q154 (printed 160) Physics

Q160. A projectile is launched in air with certain angle; its velocity is maximum at:

- A. Point of projection ✓ **Correct answer**

- C. Between launching and highest point
- D. At all points

A. Neglecting air resistance, speed is greatest at launch (and again on landing at the same level); correct.

B. Speed is at its MINIMUM at the highest point (vertical component zero).

C. Speed decreases continuously on the way up; no intermediate point exceeds the launch speed.

D. Speed changes along the trajectory; it is not constant.

Question Q155 (printed 161) Physics

Q161. If the distance between two charges is halved and magnitude of charges are also doubled, then the force between these charges becomes:

- A. two times
- B. four times
- C. eight times
- D. sixteen times ✓ **Correct answer**

A. Accounts for only one of the two changes.

B. The factor from doubling both charges alone (2 × 2), ignoring the distance change.

C. No combination of the stated changes gives ×8.

D. $F \propto q_1 q_2 / r^2$: doubling both charges gives ×4, halving r gives ×4 $(1/(½)^2)$, total ×16; correct.

Question Q156 (printed 162) Physics

Q162. If a body having mass m1 (2 kg), moving with 5 m/s approaches another mass, m2 (3 kg) with speed of 1 m/s in same direction, relative speed of approach is 4 m/s. Relative

paration after collision will be:

- A. 4 m/s ✓ **Correct answer**
- B. 2 m/s
- C. 6 m/s
- D. depends on masses

A. In an ELASTIC collision the relative speed of separation equals the relative speed of approach (coefficient of restitution e = 1): 4 m/s; correct only under that unstated assumption.

B. Would follow from some particular inelastic collision, but no data (masses alone do not fix it without e) supports 2 m/s specifically.

C. Would require e > 1 (energy gain), impossible in an ordinary collision.

D. The separation speed depends on the coefficient of restitution, not on the masses as such; for a general collision it is e × 4 m/s, and the stem never states e. NOTE: the stem does not state that the collision is elastic; the answer rests on that unstated assumption. PROMOTED to VERIFIED — 8 Nov 2026 push under the owner's verification standard (one source is FINAL): the official key and the standard elastic-collision result agree. Caveat kept: for a general collision the separation speed is e × 4 m/s, and the stem never states e.

Question Q157 (printed 163) English

Q163. Which of the following sentences has correct subject verb agreement?

- A. The teacher give the students homework.
- B. The teacher gives the students homework. ✓ **Correct answer**
- C. The teachers gives the student homework.
- D. The teachers given the student homework.

A. Singular subject "teacher" needs "gives"; "give" is the plural form.

B. Singular subject with singular verb "gives"; correct.

ject "teachers" needs "give", not "gives".

D. "Given" is a participle, not a finite verb; the sentence has no main verb.

Question Q158 (printed 164) English

Q164. The keys were found _____ the drawer where you left them last week.

- A. under
- B. in ✓ **Correct answer**
- C. on
- D. beside

A. "Under the drawer" would mean beneath it, not where keys left inside a drawer are found.

B. Keys left inside a drawer are found "in" it; correct.

C. "On the drawer" would mean on top of it.

D. "Beside the drawer" means next to it, not inside it.

Question Q159 (printed 165) English

Q165. Identify the sentence among of the following, which is punctuated correctly?

- A. The teaching staff asked the principal what time the meeting would start.
- B. The teaching staff asked the principal: "What time would the meeting start?"
- C. The teaching staff asked the principal, "What time would the meeting start?" ✓ **Correct answer**
- D. The teaching staff asked the principal; "What time would the meeting start?"

A. Grammatical as indirect speech, but it has no quotation and no punctuation introducing direct speech; it is not the punctuated direct-speech sentence asked for.

B. A colon is not the standard introduction to a short direct quotation after a reporting

C. A comma introduces the direct quotation in the standard way; correct.

D. A semicolon cannot introduce a quotation in this construction.

Question Q160 (printed 166) English

Q166. "She was elated when she got first position in exams." What is the meaning of "elated" In this sentence?

- A. Defeated
- B. Worried
- C. Excited ✓ **Correct answer**
- D. Mad

A. The opposite feeling: defeat follows losing, not coming first.

B. Anxiety, the opposite of the joyful context.

C. "Elated" means very happy and excited, fitting first position; correct (closest option: "overjoyed" would be exact, "excited" is the listed sense).

D. Angry or insane; unrelated to joyful success.

Question Q161 (printed 167) English

Q167. The board of directors expressed_____disappointment with the financial results.

- A. their
- B. its ✓ **Correct answer**
- C. his or her
- D. one's

A. Treats the board as plural individuals; in formal usage the board as a single body takes

B. The board is a single collective body, so the singular possessive "its" is the formal choice; correct.

C. Refers to a single person, not a board.

D. A generic possessive, unsuitable for a specific board.

Question Q162 (printed 168) English

Q168. It rained all night; _____ the roads were flooded in the morning.

- A. similarly
- B. instead
- C. as a result ✓ **Correct answer**
- D. in contrast

A. Shows similarity, not cause and effect.

B. Shows substitution, not consequence.

C. The flooding is the consequence of the night's rain; correct.

D. Shows opposition, not consequence.

Question Q163 (printed 169) English

Q169. The manager accepted the cashier's _____ for coming late.

- A. expalanation
- B. explaination
- C. explanation ✓ **Correct answer**
- D. explantion

A. Misspelling (extra "a").

misspelling ("ai" for "a").

C. The correct spelling; correct.

D. Misspelling (missing "a").

Question Q164 (printed 170) English

Q170. The writer has unearthed serious irregularities in the entire project. The word 'unearthed' In this sentence means

- A. written
- B. mentioned
- C. exposed ✓ **Correct answer**
- D. stated

A. The writer wrote about the irregularities, but "unearthed" means discovering them, not writing them.

B. Merely mentioning is weaker than uncovering.

C. "Unearthed" figuratively means dug up and revealed: exposed; correct.

D. Stating is asserting; "unearthed" adds the discovery/revelation sense.

Question Q165 (printed 171) English

Q171. Identify the sentence with no spelling error:

- A. Imtiaz invited me on a dinner party at restaurant. ✓ **Correct answer**
- B. Imtiaz invited me on a dier party at restaurant.
- C. Imtiaz invited me on a dinner party at restaurent.
- D. Imtiaz invited me on a dinnar party at restaurent.

A. Every word is spelled correctly ("dinner", "restaurant"); correct under the spelling-only criterion the stem states, although "on a dinner party" is awkward grammar (it should be

party ?.

B. "dier" is a misspelling of "dinner".

C. "restaurent" misspells "restaurant".

D. Two misspellings: "dinnar" and "restaurent".

Question Q166 (printed 172) Logical Reasoning

Q172. What will come next? 1, 4, 2, 5, 3, 6, 4, 7, ?

- A. 5 ✓ **Correct answer**
- B. 6
- C. 7
- D. 8

A. The pattern alternates +3, −2: 1→4 (+3), 4→2 (−2), 2→5 (+3), 5→3 (−2), 3→6 (+3), 6→4 (−2), 4→7 (+3), so the next step is −2: 7−2 = 5; correct.

B. Would continue +3 then −2 in the wrong order (or repeat 6).

C. Repeats the last term; no step in the pattern gives 7 again here.

D. Would require +1, which is not a step in the pattern.

Question Q167 Logical Reasoning

All daffodils are plants. All plants are living things. Some living things are real. Conclusions: I. All daffodils are living things. II. Some living things are flowers. III. All daffodils are real. Which conclusions follow?

- A. Only I ✓ **Correct answer**
- B. Only I and II
- C. Only II and III
- D. All follow

n I follows by transitivity: daffodils ⊆ plants ⊆ living things; correct under the convention used.

B. II needs the extra facts that daffodils are flowers AND that at least one daffodil exists; the premises state neither (no premise says daffodils are flowers).

C. III would need "all living things are real" or that daffodils fall within the "some living things" that are real; "some" does not license "all".

D. II and III do not follow for the reasons above. NOTE: under strict modern logic, universal premises carry no existential import, so even I's status depends on convention; the keyed reading (Aristotelian, assuming the classes are non-empty) is the paper's convention. PROMOTED to VERIFIED — 8 Nov 2026 push under the owner's verification standard (one source is FINAL), with this caveat kept prominent.

Question Q168 Logical Reasoning

One apple pie has 10 slices, and each apple pie feeds five people. Henry is having a party with 200 people. How many slices of pie does he need?

- A. 200
- B. 50
- C. 400 ✓ **Correct answer**
- D. 100

A. That is the number of PEOPLE, not slices.

B. No correct arithmetic gives 50 (it is 200 ÷ 4, an irrelevant division).

C. 200 people ÷ 5 per pie = 40 pies; 40 × 10 slices = 400 slices; correct.

D. That is 200 ÷ 2, not the pies-and-slices calculation.

Q169 Logical Reasoning

How many trees are in the orchard? Which of the statements below are needed to sufficiently answer this question? I. Ibrahim is a farmer and looks after half of the trees in the orchard II. 300 trees in the orchard are under Ibrahim's care

- A. i is enough
- B. ii is enough
- C. both I and II are needed ✓ **Correct answer**
- D. neither i or ii are sufficient

A. Statement I gives a proportion (half) with no number, so the total cannot be found.

B. Statement II gives 300 trees but not what fraction they are, so the total cannot be found.

C. Together: half the trees = 300, so the total is 600; correct.

D. False: together they do determine the total (600).

Question Q170 Logical Reasoning

P and Q are M's parents. M and N are siblings. Q is N's mother. What is P to M?

- A. Mother
- B. Father ✓ **Correct answer**
- C. Sister
- D. Brother

A. Q is the mother; P is the OTHER parent, so P is not the mother.

B. P and Q are M's two parents and Q is the mother, so P is the father; correct.

C. P is a parent of M, not a sibling.

D. P is a parent of M, not a sibling.

Q171 Logical Reasoning

Asad bought 50 packets of biscuits for the price of Rs. 500; whereas Anum bought 25 packets of chips for the price of Rs.1000. While comparing the prices of packets of biscuits and packet of chips, which of the following statements is correct?

- A. Price of 4 packets of biscuits is equal to the price of 1 packet of chips ✓ **Correct answer**
- B. Price of 1 packet of biscuits is equal to the price of 4 packets of chips
- C. Price of 2 packets of biscuits is equal to the price of 1 packet of chips
- D. Price of 1 packet of biscuits is equal to the price of 2 packets of chips

A. Biscuit packet = 500/50 = Rs 10; chips packet = 1000/25 = Rs 40; 4 × 10 = 40; correct.

B. Reversed: one biscuit packet (Rs 10) cannot equal four chips packets (Rs 160).

C. Two biscuit packets cost Rs 20, not Rs 40.

D. One biscuit packet (Rs 10) vs two chips packets (Rs 80); false.

Question Q172 Logical Reasoning

The virus spreads rapidly in the town. It infected the people - First day: 8, Second day: 1 Third day: 32. What will the number of people infected on the next day?

- A. 44 people
- B. 56 people
- C. 64 people ✓ **Correct answer**
- D. 74 people

A. No doubling pattern gives 44 from 8 and 32.

B. No doubling pattern gives 56.

C. The intended pattern is doubling: 8, 16, 32, 64 — the printed second-day figure "1" is a transcription error for "16", confirmed by the Testpoint reproduction of the exact item

: 16").

D. No doubling pattern gives 74. NOTE: as printed in the transcription, the sequence 8, 1, 32 has no valid pattern; the printed "1" is a transcription error for "16", confirmed by the Testpoint reproduction of the exact item. The defect is stated, not silently repaired. PROMOTED to VERIFIED — 8 Nov 2026 push under the owner's verification standard (one source is FINAL).

Question Q173 Logical Reasoning

Which of the following is a result of poor design that could cause an accident in the workplace?

- A. Equipment failure
- B. Slippery surfaces
- C. Insufficient lighting
- D. Unplanned workspace layout ✓ **Correct answer**

A. Usually a maintenance/reliability failure, not specifically a design result.

B. Usually a housekeeping/maintenance issue (spills, flooring upkeep), not design as such.

C. Can be a design fault, but is usually classed as an environmental/facilities failure rather than "poor design" of the workspace layout.

D. Directly a result of poor design: an unplanned layout creates hazards and obstructed workflows; the keyed "best" answer; the signed official key confirms D. PROMOTED to VERIFIED — 8 Nov 2026 push under the owner's verification standard (one source is FINAL). Caveat kept: a workplace-design source calls inadequate lighting a design aspect too ("Inadequate lighting is another design aspect that can lead to accidents"); the keyed reading classifies lighting as an environmental/facilities failure rather than a design result.

Question Q174 Logical Reasoning

Which of the following is the main cause of accidents involving equipment?

rconfidence

- B. Insufficient maintenance ✓ **Correct answer**
- C. Fatigue
- D. Poor training

A. A human factor that contributes to accidents generally, but not the main cause tied specifically to equipment.

B. Poorly maintained equipment is the most direct cause of equipment failure and equipment accidents; the keyed "best" answer; the signed official key and the systematic-review evidence confirm B (see the promotion note at the end of this paragraph).

C. A human factor contributing to operator error, not the main equipment-specific cause.

D. Contributes to misuse, but the question asks for the main cause of accidents INVOLVING EQUIPMENT, keyed to maintenance. PROMOTED to VERIFIED — 3737r-batch-addendum-2026-11-08.md (8 Nov 2026): Signed official UHS key (Paper ID-D Q180 = B) + a peer-reviewed systematic review ('inadequate maintenance procedures' the most common cause) agree. Caveat: one prep bank keys D (poor training).

Question 12 Biology

Which of the following is the auditory relay Centre and Centre that controls reflex movement of eyes?

- A. Forebrain
- B. Cerebellum
- C. Midbrain ✓ **Correct answer**
- D. Cerebellum

A. The cerebrum handles higher processing and conscious perception, not the auditory relay or reflex eye movements.

B. Coordinates voluntary movement, posture and balance; it is not the auditory relay centre. (Options B and D print the same word — see note below.)

The midbrain (corpora quadrigemina) holds the inferior colliculi, the mandatory relay station for virtually all ascending auditory pathways, and the superior colliculi, which control reflex eye movements (saccades) and head orientation to sounds.

D. Prints the same word as option B: a duplicated option in the reproduction, and wrong for the same reason. NOTE: options B and D both print "Cerebellum" in the second reproduction — a duplicated option as printed; it does not affect the answer, since neither is correct.

Note: Gap-fill: recovered from the second reproduction (educationinkarachi, 180 MCQs, Paper ID-D) and folded into the file 8 Nov 2026. VERIFIED from independent reference facts (midbrain: inferior colliculus is the auditory relay, superior colliculus controls reflex eye movements) and rests on one reproduction's key — one source is FINAL under the owner's 8 Nov 2026 verification standard. Options B and D both print "Cerebellum" in the reproduction — a duplicated option as printed.

Question 42 Biology

In a pea plant seed color is determined by two alleles: Y (Yellow, dominant) and y (green recessive). Which parental cross would most likely result in offspring showing a 1:1 ratio of yellow to green seeds?

- A. Yy x YY
- B. Yy x yy ✓ **Correct answer**
- C. Yy x Yy
- D. YY x yy

A. Every offspring gets a Y from the YY parent, so all offspring are yellow (½ YY, ½ Yy) — a 1:0 ratio, not 1:1.

B. Correct: the Yy parent gives Y or y with equal chance and the yy parent always gives y, so half the offspring are Yy (yellow) and half yy (green) — 1:1.

C. The classic monohybrid cross: ¼ YY, ½ Yy, ¼ yy — three yellow to one green (3:1), not

D. Every offspring is Yy and therefore yellow — a 1:0 ratio, not 1:1.

Note: Gap-fill: recovered from the second reproduction (educationinkarachi, 180 MCQs, Paper ID-D) and folded into the file 8 Nov 2026. VERIFIED from independent reference facts (test cross Yy × yy gives 1:1 yellow:green by Punnett square) and rests on one reproduction's key — one source is FINAL under the owner's 8 Nov 2026 verification standard.

Question 92 Chemistry

Oxidation numbers of X,Y,Z are +6, -2, & -1 respectively, possible molecular formula when atoms combine:

- A. $XY\ Z_2$
- B. XY_2Z_2 ✓ **Correct answer**
- C. XYZ
- D. XY Z

A. Charges: +6 (X) − 2 (Y) − 2 (two Z) = +2, not neutral; this formula cannot exist as a neutral compound.

B. Correct: +6 + 2×(−2) + 2×(−1) = 0 — the charges balance exactly, so this is the neutral formula.

C. Charges: +6 − 2 − 1 = +3, not neutral.

D. As printed this is the same formula as C with the subscripts lost in the text extraction; it does not balance either. NOTE: the option subscripts are garbled in the text extraction (recorded as extracted); only B balances, so the garble does not affect the answer — but a facsimile check of the option subscripts is still desirable.

Note: Gap-fill: recovered from the second reproduction (educationinkarachi, 180 MCQs, Paper ID-D) and folded into the file 8 Nov 2026. VERIFIED from independent reference

balance +6 + 2(−2) + 2(−1) = 0) and rests on one reproduction's key — one source is FINAL under the owner's 8 Nov 2026 verification standard. The option subscripts are garbled in the text extraction (recorded as extracted); only B balances, so the garble does not affect the answer.

Question 95 Chemistry

The order of ease of reduction of H+1, Cu+2 and Ag+1:

- A. H+1 > Cu+2 > Ag+1
- B. H+1 > Ag+1 > Cu+2
- C. Ag+1 > Cu+2 > H+1 ✓ **Correct answer**
- D. H+1 > Cu+2 = Ag+1

A. Reverses the true order: H^+ has the LOWEST reduction potential of the three (0.00 V), so it is reduced least easily, not most.

B. Wrong: H^+ is still placed first although it is the hardest to reduce, and Ag^+ and Cu^{2+} are swapped.

C. Correct: ease of reduction follows the standard reduction potential — the more positive E°, the more readily the ion gains electrons: Ag^+ (+0.80 V) > Cu^{2+} (+0.34 V) > H^+ (0.00 V).

D. Wrong on both counts: H^+ is not first, and Cu^{2+} and Ag^+ do not have equal potentials (+0.34 V vs +0.80 V).

Note: Gap-fill: recovered from the second reproduction (educationinkarachi, 180 MCQs, Paper ID-D) and folded into the file 8 Nov 2026. VERIFIED from independent reference facts (standard reduction potentials Ag^+/Ag +0.80 V > Cu^{2+}/Cu +0.34 V > H^+/H_2 0.00 V) and rests on one reproduction's key — one source is FINAL under the owner's 8 Nov 2026 verification standard.

Question 102 Chemistry

The value of Planck's constant is:

- B. 6.6262×10^{-32} J.sec
- C. $6.6262\times10^{+34}$ J.sec
- D. 6.6262×10^{-34} J.sec ✓ **Correct answer**

A. Wrong exponent: 10^{-30} is ten thousand times larger than the true value.

B. Wrong exponent: 10^{-32} is a hundred times larger than the true value.

C. Wrong sign and magnitude: 10^{+34} is enormously larger than the true value.

D. Correct: Planck's constant h = 6.626×10^{-34} joule-seconds.

Note: Gap-fill: recovered from the second reproduction (educationinkarachi, 180 MCQs, Paper ID-D) and folded into the file 8 Nov 2026. VERIFIED from independent reference facts (Planck's constant h = 6.626×10^{-34} J·s) and rests on one reproduction's key — one source is FINAL under the owner's 8 Nov 2026 verification standard.

Question 156 Physics

When an object attains terminal velocity, its acceleration is:

- A. 9.8 m/s^2
- B. Zero ✓ **Correct answer**
- C. 1 m/s^2
- D. 9.8 m/s^2

A. Wrong: 9.8 m/s^2 is the acceleration of free fall, not the acceleration at terminal velocity; it is also printed twice (see note below).

B. Correct: at terminal velocity the drag force exactly balances the weight, so the net force is zero and, by Newton's second law, the acceleration is zero.

C. No basis: nothing in the situation gives an acceleration of 1 m/s^2.

D. Prints the same value as option A: a duplicated option as printed, and wrong for the

…l. NOTE: the second reproduction keys this question A (9.8 m/s^2), which is physically WRONG; the signed official UHS key gives Q156 = B (Zero), which is the physically correct answer. Options A and D are duplicated as printed. KEY CORRECTED A → B — decided by assistant under the owner's 8 Nov 2026 delegation (official key + physics derivation).

Note: Gap-fill: recovered from the second reproduction (educationinkarachi, 180 MCQs, Paper ID-D) and folded into the file 8 Nov 2026. KEY CORRECTED A → B per the signed official UHS key (Paper ID-D Q156 = B); the reproduction's key A (9.8 m/s^2) is physically wrong — at terminal velocity the net force is zero, so acceleration is zero. Options A and D both print "9.8 m/s^2" — a duplicated option as printed.

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