MDCAT (BUMHS entry test, Blue) — 2026 · Solved Past Paper

Body: Bolan University of Medical and Health Sciences (BUMHS) · **Post:** MDCAT (BUMHS entry test, Blue) · **Year:** 2026 · **Questions:** 180 in the original paper — **180 solved and verified**, none excluded · **Price:** Free

> **How to use this paper:** each question shows the stem, the four options, and the correct answer. Click “Why each option?” under a question to see all four options explained — one question teaches four topics. General Knowledge answers are as of the 2026 sitting.

Source note: Question stems and options: official BUMHS Blue booklet (32 pp, Ref No 1683962, 20 Sep 2026), bumhs.edu.pk/images/mdcat2026/Bluebooklet.pdf (booklets listed at bumhs.edu.pk/mdcat2026booklet; accessed 9 Nov 2026). Answer key: official BUMHS MDCAT-2026 Answer Key (Blue), Q1–180, as published by BUMHS and mirrored by Nabeel Academy (cdn.sanity.io/files/wk2k7y7r/production/fff20779c25e9a03a0c83c997b1bcebc7e8e505c.pdf, 16 pp, all four colours; Blue is pp. 1–4); the Nabeel Academy page nabeelacademy.com/blog/mdcat-2026-answer-key confirms the key file and notes that two-letter rows mean both options are accepted. Cross-colour checks in the official White and Brown booklets (bumhs.edu.pk/images/mdcat2026/Whitebooklet.pdf and Brownbooklet.pdf) and the White and Brown sections of the same official key file. Exam held Saturday 20 September 2026. Blue is the same sitting as Brown, White and Yellow — the same 180 questions in a different order; do not build a second BUMHS 2026 colour. Subject split: Biology Q1–81, Chemistry Q82–126, Physics Q127–162, English Q163–171, Logical Reasoning Q172–180. Note on Q130: the official Blue, White and Brown keys all list B (becomes doubled) for the specific-heat question, but specific heat c = molar specific heat / molar mass, so doubling the molar mass with the molar specific heat constant

specific heat, A is served as correct and the key error is recorded in the Q130 explanation. Answers verified independently against reference facts, worked derivations and targeted sources, never from the printed key alone. Decisions by the assistant under the owner's 8 Nov 2026 delegation.

Question 1 Influenza virus type

Influenza is caused by:

- A. enveloped virus ✓ **Correct answer**
- B. complex virus
- C. polyhedral virus
- D. helical

A. correct: influenza virus has a lipid envelope around its capsid.

B. wrong: complex viruses (like bacteriophages) have elaborate shapes; influenza is not one.

C. wrong: influenza is not a polyhedral virus.

D. wrong: 'helical' describes the symmetry of the nucleocapsid, not the virus type asked for.

Question 2 Test cross

In fruit flies (Drosophila melanogaster), brown body is dominant to black body. If scientists want to find out the genotype of a fly with a brown body, what genotype would they cross the fly with?

- A. Heterozygous recessive
- B. Homozygous recessive ✓ **Correct answer**
- C. Heterozygous dominant
- D. Homozygous dominant

There is no 'heterozygous recessive' genotype; a recessive must be homozygous.

B. correct: to find the genotype of a brown-bodied fly, it is crossed with a homozygous recessive (black-bodied) fly — a test cross.

C. wrong: crossing with a heterozygous dominant fly cannot reveal the genotype.

D. wrong: crossing with a homozygous dominant fly gives all brown offspring whatever the tested fly's genotype.

Question 3 Inner intercostal contraction

The contraction of inner intercostal muscles and relaxation of outer intercostal muscles results in _____ movement of ribs?

- A. Downward and backward ✓ **Correct answer**
- B. Downward and forward
- C. Upward and backward
- D. Upward and forward

A. correct: contracting the inner intercostal muscles (with the outer ones relaxed) pulls the ribs downward and backward, as in expiration.

B. wrong: the ribs move downward and backward, not forward.

C. wrong: the ribs move downward, not upward.

D. wrong: the ribs move downward and backward, not upward and forward.

Question 4 Present in all viruses except

All of the following are present in all viruses, EXCEPT:

- A. Nucleic Acid
- B. Protein

elope ✓ **Correct answer**

- D. Genome

A. wrong: every virus has a nucleic acid genome.

B. wrong: every virus has a protein capsid.

C. correct: not all viruses have an envelope; only enveloped viruses do.

D. wrong: every virus has a genome (its nucleic acid).

Question 5 Lamarck's theory name

Another name of Lamarck's theory is:

- A. Theory of survival of the fittest
- B. Theory of genetic drift
- C. Theory of inheritance of acquired characters ✓ **Correct answer**
- D. Theory of natural selection

A. wrong: survival of the fittest is part of Darwin's theory.

B. wrong: genetic drift is a mechanism of evolution, not Lamarck's theory.

C. correct: Lamarck's theory is also called the theory of inheritance of acquired characters.

D. wrong: natural selection is Darwin's theory.

Question 6 HIV and T-lymphocytes

HIV weakens the immune system primarily by:

- A. Rapidly destroying red blood cells
- B. Infecting and destroying T-Lymphocytes ✓ **Correct answer**
- C. Increasing antibody production by B-Lymphocytes
- D. Blocking aerobic respiration

V does not destroy red blood cells.

B. correct: HIV infects and destroys helper T-lymphocytes (CD4 cells), weakening the immune system.

C. wrong: HIV does not increase antibody production.

D. wrong: HIV does not block aerobic respiration.

Question 7 Objection to Lamarckism

Which of the following statements, correctly states the objections, which were raised on Lamarckism?

- A. There are many experimental proofs of Lamarckism
- B. The use and disuse of organs can alter the genotype of an organism
- C. Somatic changes are heritable
- D. Organs are not modified by the wish or requirement of an organism ✓ **Correct answer**

A. wrong: the lack of experimental proof is an objection, not a statement in its favour.

B. wrong: use and disuse cannot alter the genotype; this is the Lamarckian claim itself.

C. wrong: somatic (body) changes are not heritable; this is the Lamarckian claim itself.

D. correct: the objection is that organs are not modified by an organism's wishes or needs.

Question 8 Major lipids in body

Major part of lipids in an organisms body is made up of:

- A. terpenes
- B. waxes
- C. phospholipids
- D. acylglycerols ✓ **Correct answer**

terpenes are a minor class of lipids.

B. wrong: waxes are a minor class of lipids.

C. wrong: phospholipids are important membrane lipids but not the major bulk of body lipids.

D. correct: acylglycerols (fats and oils) make up the major part of the lipids in the body.

Question 9 Pepsin and pH

In different parts of human digestive system pH varies from acidic to basic ranges. Which one is true for Pepsin to works best?

- A. Pepsin only digest proteins in alkaline medium
- B. Pepsin's active site is stable in acidic environment ✓ **Correct answer**
- C. Pepsin is not an enzyme
- D. Acid destroys the substrate

A. wrong: pepsin works in acid, not alkaline medium.

B. correct: pepsin works best in the acidic stomach because its active site is stable at low pH.

C. wrong: pepsin is a proteolytic enzyme.

D. wrong: the acid does not destroy the substrate; it provides the conditions for pepsin.

Question 10 Euchromatin

Which of the following statement correctly describes euchromatin?

- A. Highly condensed and inactive
- B. Loosely packed and transcriptionally active ✓ **Correct answer**
- C. Found only in prokaryotes
- D. Composed only of RNA

ghly condensed and inactive describes heterochromatin.

B. correct: euchromatin is loosely packed and transcriptionally active.

C. wrong: euchromatin is found in eukaryotes.

D. wrong: euchromatin is composed of DNA and protein, not only RNA.

Question 11 Sexually transmitted disease

_____ is an example of a sexually transmitted disease.

- A. Cardiovascular disease
- B. Diabetes
- C. Hypertension
- D. Syphilis ✓ **Correct answer**

A. wrong: cardiovascular disease is not sexually transmitted.

B. wrong: diabetes is not sexually transmitted.

C. wrong: hypertension is not sexually transmitted.

D. correct: syphilis is a sexually transmitted disease.

Question 12 Part within the lung

Which of the following part is present within the lung?

- A. Trachea
- B. Larynx
- C. Pharynx
- D. Bronchi ✓ **Correct answer**

A. wrong: the trachea is outside the lung, in the neck and chest.

B. wrong: the larynx is in the neck, outside the lung.

e pharynx is in the throat, outside the lung.

D. correct: the bronchi are the airways inside the lungs.

Question 13 Highest RNA concentration

Which of the following structures contains highest concentration of RNA;

- A. Cytoplasm
- B. Nucleolus ✓ **Correct answer**
- C. Centriole
- D. Chromosome

A. wrong: the cytoplasm contains RNA but not at the highest concentration.

B. correct: the nucleolus is the site of rRNA synthesis and has the highest concentration of RNA.

C. wrong: the centriole contains no RNA.

D. wrong: chromosomes are mainly DNA, not RNA.

Question 14 Induced fit model except

All of the following properties are matching with the induced fit model of enzyme action, EXCEPT:

- A. Flexibility of active site
- B. Absolute specificity due to fixed active site ✓ **Correct answer**
- C. More than one related substrates can bind active site
- D. Enzymes become saturated

A. wrong: flexibility of the active site is a feature of the induced fit model.

B. correct: a fixed active site with absolute specificity belongs to the lock-and-key model, not the induced fit model.

e induced fit model allows more than one related substrate to bind.

D. wrong: enzyme saturation is a feature of the induced fit model.

Question 15 Cause of haemophilia

What is the cause of hemophilia?

- A. Gene mutation ✓ **Correct answer**
- B. Bacteria
- C. Viruses
- D. Unknown cause

A. correct: haemophilia is caused by a mutation in a gene on the X chromosome.

B. wrong: haemophilia is not caused by bacteria.

C. wrong: haemophilia is not caused by viruses.

D. wrong: the cause of haemophilia is known to be a gene mutation.

Question 16 Cell mediated immunity

The immune response provided by _____ is called cell mediated immune response.

- A. T Cells ✓ **Correct answer**
- B. B Cells
- C. Macrophages
- D. Monocytes

A. correct: the cell-mediated immune response is provided by T cells.

B. wrong: B cells provide the humoral immune response.

C. wrong: macrophages are phagocytes, not the providers of cell-mediated immunity.

D. wrong: monocytes are phagocytes, not the providers of cell-mediated immunity.

17 Endoplasmic reticulum

Which one of the following best describes endoplasmic reticulum?

- A. Disc shaped peripheral network
- B. Flattened membrane bound vesicles
- C. Involved in development of peroxisomes
- D. Complex network of channel extended from plasma membrane to nuclear membrane ✓ **Correct answer**

A. wrong: the ER is not a disc-shaped peripheral network.

B. wrong: flattened membrane-bound sacs describe the Golgi apparatus.

C. wrong: the ER is not defined by peroxisome development.

D. correct: the endoplasmic reticulum is a complex network of channels extending from the plasma membrane to the nuclear membrane.

Question 18 Male gonads pouch

Male gonads are situated in a skin pouch called _____.

- A. Ductules
- B. Scrotum ✓ **Correct answer**
- C. Urethra
- D. Lobules

A. wrong: ductules are small ducts, not the skin pouch.

B. correct: the male gonads (testes) are situated in the skin pouch called the scrotum.

C. wrong: the urethra is the duct carrying urine and semen.

D. wrong: lobules are subdivisions of the testis, not the pouch.

19 Systolic blood pressure phase

Systolic blood pressure is measured during which phase of the heart beat?

- A. Ventricular relaxation
- B. Ventricular contraction ✓ **Correct answer**
- C. Atrial contraction
- D. Atrial relaxation

A. wrong: relaxation is diastole, when the pressure is lowest.

B. correct: systolic pressure is measured during ventricular contraction (systole).

C. wrong: atrial contraction does not set the systolic pressure.

D. wrong: atrial relaxation does not set the systolic pressure.

Question 20 Lamarck giraffe neck

According to the Lamarckism, long neck giraffes evolved because:

- A. nature favors only long neck giraffes
- B. they are less harmful to human than short neck giraffes
- C. long neck giraffes predated the short neck giraffes
- D. stretching of necks over many generations by short necked ones ✓ **Correct answer**

A. wrong: favouring by nature is natural selection, not Lamarckism.

B. wrong: harm to humans is irrelevant.

C. wrong: predation is not the Lamarckian explanation.

D. correct: by Lamarckism, short-necked giraffes stretched their necks over generations and passed the acquired length to their offspring.

21 Gene information form

Information contained in the gene, which is needed by an organism, for the expression of its traits is in the form of:

- A. carbohydrates
- B. proteins ✓ **Correct answer**
- C. lipids
- D. nucleic acids

A. wrong: genetic information is not carried as carbohydrates.

B. correct: the information in a gene is expressed in the form of proteins, which produce the organism's traits.

C. wrong: genetic information is not carried as lipids.

D. wrong: the gene itself is nucleic acid, but the information it carries is expressed as proteins (the textbook answer).

Question 22 Adenine ribose phosphate

The combination of adenine, ribose and one phosphate group is called:

- A. Adenosine super phosphate
- B. Adenosine monophosphate ✓ **Correct answer**
- C. Deoxyadenosine phosphate
- D. Ribonucleoside

A. wrong: there is no such compound.

B. correct: adenine + ribose + one phosphate group is adenosine monophosphate (AMP).

C. wrong: deoxyadenosine contains deoxyribose, not ribose.

D. wrong: a ribonucleoside is a base + ribose without the phosphate.

23 Cardiac cycle duration

The average duration for one complete cardiac cycle in healthy human is _____ seconds.

- A. 0.15
- B. 0.3
- C. 0.4
- D. 0.8 ✓ **Correct answer**

A. wrong: one cardiac cycle is about 0.8 s, not 0.15 s.

B. wrong: one cardiac cycle is about 0.8 s, not 0.3 s.

C. wrong: one cardiac cycle is about 0.8 s, not 0.4 s.

D. correct: at a normal heart rate of about 75 beats per minute, one complete cardiac cycle lasts about 0.8 seconds.

Question 24 Active site regions

The active sites of enzyme are composed of ____ region(s).

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

A. wrong: the active site has two regions, not one.

B. correct: the active site is composed of two regions, the binding site and the catalytic site.

C. wrong: the active site has two regions, not three.

D. wrong: the active site has two regions, not four.

25 Sensory relay centre

In the human brain, sensory signals from different parts of the body are first processed and redirected to appropriate regions of the cerebrum for interpretation. Which brain structure functions as this main sensory relay center?

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

A. correct: the thalamus is the main sensory relay centre, processing and redirecting sensory signals to the cerebrum.

B. wrong: the cerebellum coordinates movement, it is not the sensory relay centre.

C. wrong: the hypothalamus regulates homeostasis, it is not the sensory relay centre.

D. wrong: the medulla controls involuntary functions, it is not the sensory relay centre.

Question 26 Proteins before respiration

In energy releasing metabolism, proteins must undergo _____ before entering respiratory metabolism.

- A. Acetylation
- B. Deamination ✓ **Correct answer**
- C. Decarboxylation
- D. Dehydration

A. wrong: acetylation is not the step that prepares proteins for respiration.

B. correct: proteins must be deaminated (their amino groups removed) before entering respiratory metabolism.

C. wrong: decarboxylation removes carbon dioxide, it is not the preparatory step for

D. wrong: dehydration is not the step that prepares proteins for respiration.

Question 27 Pyrimidines pair

Which of the under mentioned pair of nucleotides correctly represent Pyrimidines?

- A. Cytosine and Thymine ✓ **Correct answer**
- B. Adenine and Guanine
- C. Thymine and Guanine
- D. Adenine and Cytosine

A. correct: cytosine and thymine are the pyrimidine bases.

B. wrong: adenine and guanine are purines.

C. wrong: guanine is a purine, not a pyrimidine.

D. wrong: adenine is a purine, not a pyrimidine.

Question 28 HIV integration enzyme

During HIV replication process, viral DNA is integrated into host genome by _____.

- A. Reverse transcriptase
- B. Helicase
- C. Integrase ✓ **Correct answer**
- D. Polymerase

A. wrong: reverse transcriptase makes viral DNA from RNA; it does not integrate it.

B. wrong: helicase unwinds DNA; it does not integrate viral DNA.

C. correct: integrase inserts the viral DNA into the host genome.

D. wrong: polymerase copies DNA; it does not integrate viral DNA.

29 Cartilage in trachea and bronchi

How does a cartilage function in trachea and bronchi?

- A. makes them harder
- B. divides them into compartments
- C. prevents them from collapsing ✓ **Correct answer**
- D. narrows their passage

A. wrong: cartilage does not merely make them harder.

B. wrong: cartilage does not divide them into compartments.

C. correct: the cartilage rings keep the trachea and bronchi open and prevent them from collapsing.

D. wrong: cartilage does not narrow the passage.

Question 30 Anti-venom immunity type

Anti-venom contains antibodies produced in an animal. This anti- venom can be injected to give protection against snake bite venom. Which type of immunity is this?

- A. Natural Active Immunity
- B. Natural Passive Immunity
- C. Artificial Active Immunity
- D. Artificial Passive Immunity ✓ **Correct answer**

A. wrong: the antibodies are not produced by the person's own body after natural infection.

B. wrong: the antibodies are given artificially, not received naturally.

C. wrong: the person does not produce the antibodies actively; they are injected ready-made.

D. correct: injecting ready-made antibodies produced in an animal is artificial passive

Question 31 Diaphragm on expiration

During expiration relaxation of the diaphragm causes it to become:

- A. more dome shaped ✓ **Correct answer**
- B. less dome shaped
- C. flat
- D. U shaped

A. correct: on expiration the diaphragm relaxes and becomes more dome-shaped.

B. wrong: the diaphragm becomes more dome-shaped, not less.

C. wrong: the diaphragm is flat when contracted (inspiration), not on expiration.

D. wrong: the diaphragm does not become U-shaped on expiration.

Question 32 Stomach acid

In the stomach, _____ softens the food and kills many microorganisms present in food.

- A. Pepsin
- B. Hydrochloric Acid ✓ **Correct answer**
- C. Bile
- D. Pepsinogen

A. wrong: pepsin digests proteins; it does not soften food or kill microbes.

B. correct: hydrochloric acid in the stomach softens food and kills many microorganisms.

C. wrong: bile acts in the small intestine, not the stomach.

D. wrong: pepsinogen is the inactive precursor of pepsin.

33 Cell mediated third line

Cell mediated immune response is the third line of defence of the body, which is provided by _____.

- A. B-Lymphocytes
- B. T-Lymphocytes ✓ **Correct answer**
- C. Monocytes
- D. Histamines

A. wrong: B-lymphocytes provide humoral immunity.

B. correct: the cell-mediated response (third line of defence) is provided by T-lymphocytes.

C. wrong: monocytes are phagocytes of the second line of defence.

D. wrong: histamines are chemicals of the inflammatory response, not cells.

Question 34 Amygdala feelings

A person was humiliated publicly by his boss, followed by sympathetically supported by his colleagues. Which part of his brain is dealing all these feelings of embarrassment and being cared?

- A. Pons
- B. Hypothalamus
- C. Hippocampus
- D. Amygdala ✓ **Correct answer**

A. wrong: the pons relays signals; it does not process feelings.

B. wrong: the hypothalamus regulates homeostasis, not feelings of embarrassment.

C. wrong: the hippocampus deals with memory, not these feelings.

D. correct: the amygdala processes emotions such as embarrassment and the feeling of being cared for.

35 Most toxic waste

Which of the following waste product is the most toxic and need extra water for its removal?

- A. Urea
- B. Uric acid
- C. Ammonia ✓ **Correct answer**
- D. Creatinine

A. wrong: urea is less toxic than ammonia.

B. wrong: uric acid is the least toxic of the three.

C. correct: ammonia is the most toxic nitrogenous waste and needs much water for its removal.

D. wrong: creatinine is a waste product but not the most toxic.

Question 36 Bone cell types

Bones are made up of three types of cells. Which of the following options correctly identifies these cells?

- A. Osteocytes, lymphocytes and osteoblasts
- B. Osteocytes, osteoclasts and osteoblasts ✓ **Correct answer**
- C. Osteocytes, oocytes and osteoblasts
- D. Osteocytes, osteoclasts and neutrophils

A. wrong: lymphocytes are white blood cells, not bone cells.

B. correct: the three bone cell types are osteocytes, osteoclasts and osteoblasts.

C. wrong: oocytes are egg cells, not bone cells.

D. wrong: neutrophils are white blood cells, not bone cells.

37 Codons for 300 amino acids

Approximate number of codons for a polypeptide having 300 amino acids are:

- A. 100
- B. 200
- C. 300 ✓ **Correct answer**
- D. 900

A. wrong: each amino acid needs one codon, so 300 amino acids need 300 codons.

B. wrong: 300 amino acids need 300 codons.

C. correct: approximately one codon codes for each amino acid, so 300 amino acids need about 300 codons.

D. wrong: 900 is the number of nucleotides (three per codon), not the number of codons.

Question 38 Haemophilia children

If female is homozygous normal and male is suffering from hemophilia, the trait in children will appear like?

- A. Daughters normal & sons hemophilic
- B. Daughters carrier & sons hemophilic
- C. Daughters carrier & sons normal ✓ **Correct answer**
- D. All sons & daughters hemophilic

A. wrong: the daughters are carriers, not normal.

B. wrong: the sons receive a normal X from their mother and are normal.

C. correct: the homozygous normal mother gives a normal X to all children; daughters also receive the affected X from their father (carriers) and sons receive the Y (normal).

D. wrong: no child is haemophiliac in this cross.

39 Haemophiliac parents offspring

If a woman is hemophiliac and her husband is also hemophiliac, who among her offspring would be normal?

- A. Sons
- B. Daughters
- C. Sons and Daughters
- D. None of the offspring ✓ **Correct answer**

A. wrong: the sons receive the affected X from their mother and are haemophiliac.

B. wrong: the daughters receive an affected X from each parent and are haemophiliac.

C. wrong: all offspring are haemophiliac.

D. correct: both parents are haemophiliac, so no offspring can be normal.

Question 40 Gene therapy vector

_____ is used to infect the stem cells with normal genes in gene therapy.

- A. Agrobacterium
- B. Retroviruses ✓ **Correct answer**
- C. Bacteriophages
- D. Bacterial plasmids

A. wrong: Agrobacterium is used to transfer genes into plants, not human stem cells.

B. correct: retroviruses are used to infect stem cells with normal genes in gene therapy.

C. wrong: bacteriophages infect bacteria, not human stem cells.

D. wrong: bacterial plasmids are used in bacterial gene transfer, not for human stem cells.

41 Bicuspid valve

The bicupsid valve (atrioventricular valve) is the valve between the:

- A. right atrium and the right ventricle that prevents backflow of blood from the atrium to the ventricle when the ventricle contracts.
- B. left atrium and the right ventricle that prevents backflow of blood from the atrium to the ventricle when the ventricle contracts.
- C. left atrium and the left ventricle that prevents backflow of blood into the atrium when the ventricle contracts. ✓ **Correct answer**
- D. right atrium and the left ventricle that prevents backflow of blood into the atrium when the ventricle contracts.

A. wrong: the valve between the right atrium and right ventricle is the tricuspid valve.

B. wrong: the bicuspid valve does not join the left atrium to the right ventricle.

C. correct: the bicuspid (mitral) valve lies between the left atrium and the left ventricle and prevents backflow into the atrium.

D. wrong: the bicuspid valve does not join the right atrium to the left ventricle.

Question 42 Largest lymph vessel

Which of the following is a largest lymph vessel?

- A. Iliac
- B. Subclavian
- C. Thoracic ✓ **Correct answer**
- D. Lacteal

A. wrong: the iliac vessels are blood vessels, not the largest lymph vessel.

B. wrong: the subclavian is a blood vessel; the lymph drains into it, but it is not a lymph vessel.

e thoracic duct is the largest lymph vessel in the body.

D. wrong: lacteals are small lymph vessels in the intestinal villi.

Question 43 Haemophilia mostly males

Why do hemophilia A and B mostly affect males?

- A. It is carried only by genes on Y chromosome
- B. It is carried only by genes on X chromosome ✓ **Correct answer**
- C. It only occurs when there are two Y chromosomes
- D. It makes them to be carriers, but not impacted by the disease

A. wrong: haemophilia is carried on the X chromosome, not the Y.

B. correct: haemophilia is X-linked recessive, so males (with one X) are affected while females are usually carriers.

C. wrong: there is no such condition.

D. wrong: males are impacted by the disease, not merely carriers.

Question 44 Sodium uptake ascending limb

Which of the following hormone is responsible for the active uptake of sodium in the ascending limb?

- A. Aldosterone ✓ **Correct answer**
- B. Oestrogen
- C. Testosterone
- D. ADH

A. correct: aldosterone is responsible for the active uptake of sodium in the ascending limb and distal parts of the nephron.

B. wrong: oestrogen does not regulate sodium uptake in the nephron.

stosterone does not regulate sodium uptake in the nephron.

D. wrong: ADH regulates water reabsorption, not sodium uptake.

Question 45 HCl secreting cells

In the stomach HCl is secreted by _____.

- A. Zymogen cells
- B. Chief cells
- C. Oxyntic cells ✓ **Correct answer**
- D. F cells

A. wrong: zymogen (chief) cells secrete pepsinogen, not HCl.

B. wrong: chief cells secrete pepsinogen, not HCl.

C. correct: oxyntic (parietal) cells secrete hydrochloric acid in the stomach.

D. wrong: F cells are pancreatic cells, not stomach cells.

Question 46 Liver detoxification

Drugs and other poisonous substances in blood are cleared by?

- A. Villi
- B. Lacteal
- C. Rectum
- D. Liver ✓ **Correct answer**

A. wrong: villi absorb nutrients; they do not clear poisons from blood.

B. wrong: lacteals absorb fats; they do not clear poisons.

C. wrong: the rectum stores faeces; it does not clear poisons from blood.

D. correct: the liver detoxifies drugs and poisonous substances in the blood.

47 Sarcomere

Contractile unit of skeletal muscles is:

- A. Sarcomere ✓ **Correct answer**
- B. A band
- C. Myofilament
- D. I band

A. correct: the sarcomere is the contractile unit of skeletal muscle.

B. wrong: the A band is a region of the sarcomere, not the contractile unit itself.

C. wrong: myofilaments are the actin and myosin threads within the sarcomere.

D. wrong: the I band is a region of the sarcomere, not the contractile unit itself.

Question 48 Lock and key

According to the Lock and Key Hypothesis, Enzymes acts as a _____ and substrate acts as a _____.

- A. Lock, Key ✓ **Correct answer**
- B. Lock, Knob
- C. Key, Lock
- D. Knob, Door

A. correct: by the lock-and-key hypothesis, the enzyme acts as the lock and the substrate as the key.

B. wrong: the substrate is the key, not a knob.

C. wrong: the roles are reversed; the enzyme is the lock.

D. wrong: neither a knob nor a door is part of the hypothesis.

49 Proteins in cell structures

Which of the following biological molecules are abundantly present in the membranes, ribosomes, cytoskeleton and enzymes of the cell?

- A. lipids
- B. proteins ✓ **Correct answer**
- C. carbohydrates
- D. nucleic acid

A. wrong: lipids are abundant in membranes but not in ribosomes, cytoskeleton and enzymes.

B. correct: proteins are abundantly present in membranes, ribosomes, the cytoskeleton and enzymes.

C. wrong: carbohydrates are not abundant in ribosomes, cytoskeleton and enzymes.

D. wrong: nucleic acids are present in ribosomes but not abundantly in membranes, cytoskeleton and enzymes.

Question 50 Urea formation

Formation of urea occurs in _____.

- A. Kidney
- B. Blood
- C. Liver ✓ **Correct answer**
- D. Intestine

A. wrong: the kidney excretes urea; it does not form it.

B. wrong: urea is carried in blood but not formed there.

C. correct: urea is formed in the liver by the urea cycle.

D. wrong: urea is not formed in the intestine.

51 Hyaline cartilage

The most common cartilage found in ribs and nose is _____.

- A. Hyaline cartilage ✓ **Correct answer**
- B. Elastic cartilage
- C. Fibro cartilage
- D. Neuro cartilage

A. correct: hyaline cartilage is the most common cartilage, found in the ribs and nose.

B. wrong: elastic cartilage is found in the ear and epiglottis.

C. wrong: fibrocartilage is found in intervertebral discs.

D. wrong: there is no cartilage called neuro cartilage.

Question 52 Glycine entry point

After deamination, glycine (NH2CH2COOH), enters into energy yielding metabolism in the form of:

- A. G-3-P
- B. Pyruvate
- C. Acetyl Co-A ✓ **Correct answer**
- D. Oxaloacetate

A. wrong: glycine does not enter as glyceraldehyde-3-phosphate.

B. wrong: the textbook entry point for glycine after deamination is acetyl CoA.

C. correct: after deamination, glycine enters energy-yielding metabolism as acetyl CoA.

D. wrong: glycine does not enter as oxaloacetate.

53 Mismatched pair

Which of the following is mismatched?

- A. Phospholipid & choline
- B. Steroids & protein ✓ **Correct answer**
- C. Glucose & fructose
- D. Protein & peptide chain

A. wrong: phospholipids do contain choline, so this pair is matched.

B. correct: steroids are lipids, not proteins, so this pair is mismatched.

C. wrong: glucose and fructose are both monosaccharides, so this pair is matched.

D. wrong: a protein is made of peptide chains, so this pair is matched.

Question 54 Semilunar valves

Which structures prevent backflow into ventricles during ventricular diastole?

- A. AV valves
- B. Semilunar valves ✓ **Correct answer**
- C. Interventricular Septum
- D. Chordae tendineae

A. wrong: the AV valves prevent backflow into the atria, not into the ventricles.

B. correct: the semilunar valves prevent blood from flowing back into the ventricles during ventricular diastole.

C. wrong: the septum separates the ventricles; it does not prevent backflow.

D. wrong: the chordae tendineae hold the AV valves, they do not prevent backflow into the ventricles.

55 Anabolic catalysis control

Catalysis of anabolic reaction for protein synthesis is controlled by:

- A. Ions
- B. Carbohydrates
- C. Enzymes ✓ **Correct answer**
- D. Lipids

A. wrong: ions do not control the catalysis of anabolic protein synthesis.

B. wrong: carbohydrates do not control this catalysis.

C. correct: enzymes catalyse and control anabolic reactions such as protein synthesis.

D. wrong: lipids do not control this catalysis.

Question 56 Linkage deviation

In AaBb x AaBb cross, phenotype ratio deviates in F2 generation from 9:3:3:1 when _____.

- A. Alleles are dominant
- B. Genes are linked ✓ **Correct answer**
- C. Traits are recessive
- D. Gametes are equal

A. wrong: dominance alone does not change the 9:3:3:1 ratio.

B. correct: when genes are linked on the same chromosome, the F2 ratio deviates from 9:3:3:1.

C. wrong: recessiveness alone does not change the ratio.

D. wrong: equal gametes are assumed in the 9:3:3:1 ratio itself.

57 Ester bond type

Ester bond in the biomolecules is a type of_____.

- A. Ionic bond
- B. Covalent bond ✓ **Correct answer**
- C. Hydrogen bond
- D. Disulphide bond

A. wrong: an ester bond is not an ionic bond.

B. correct: an ester bond is a covalent bond.

C. wrong: an ester bond is not a hydrogen bond.

D. wrong: an ester bond is not a disulphide bond.

Question 58 Maternal antibodies

Introduction of antibodies from mother to baby during breast feeding is:

- A. Natural Active Immunity
- B. Artificial Active Immunity
- C. Natural Passive Immunity ✓ **Correct answer**
- D. Artificial Passive Immunity

A. wrong: the baby does not produce the antibodies itself.

B. wrong: the antibodies are not produced actively by the baby.

C. correct: antibodies passed naturally from mother to baby in breast milk give natural passive immunity.

D. wrong: the transfer is natural (breastfeeding), not artificial.

59 Enzyme does not affect

Which one of the following is not affected by an enzyme during catalysis?

- A. Quantity of product
- B. Nature of product ✓ **Correct answer**
- C. Activation energy
- D. Time to reach equilibrium

A. wrong: in a given time the enzyme increases the quantity of product formed (it speeds the reaction).

B. correct: an enzyme never changes the nature of the product; it only speeds up its formation.

C. wrong: the enzyme lowers the activation energy.

D. wrong: the enzyme shortens the time needed to reach equilibrium.

Question 60 Depolarisation ion influx

Influx of which one of the following ions, takes place during depolarization state across neurons?

- A. Magnesium
- B. Sodium ✓ **Correct answer**
- C. Potassium
- D. Iron

A. wrong: magnesium does not flow in during depolarisation.

B. correct: during depolarisation, sodium ions flow into the neuron.

C. wrong: potassium flows out during repolarisation, not in during depolarisation.

D. wrong: iron does not flow in during depolarisation.

61 Kidney failure first sign

If the kidneys begin to loose their ability to function properly, which of the following is most likely to occur first?

- A. Electrolyte imbalance
- B. Accumulation of nitrogenous waste like urea ✓ **Correct answer**
- C. Dehydration due to reduced water re-absorption
- D. Hormonal imbalance

A. wrong: electrolyte imbalance follows later, after waste accumulates.

B. correct: when the kidneys fail, nitrogenous waste such as urea accumulates first.

C. wrong: dehydration is a later consequence, not the first.

D. wrong: hormonal imbalance follows later.

Question 62 Gonorrhoea symptoms

A male adult patient shows burning urination and pus discharge. Most probable infection is _____.

- A. Gonorrhea ✓ **Correct answer**
- B. AIDS
- C. Herpes simplex
- D. Syphilis

A. correct: burning urination with pus discharge in a male is most probably gonorrhoea.

B. wrong: AIDS does not present with burning urination and pus discharge.

C. wrong: herpes simplex causes blisters, not pus discharge.

D. wrong: syphilis presents with a chancre, not burning urination with pus.

63 Digestion and absorption

Which part of alimentary canal performs both functions of digestion and absorption?

- A. Oral cavity
- B. Stomach
- C. Small intestine ✓ **Correct answer**
- D. Large intestine

A. wrong: the oral cavity digests starch but absorbs almost nothing.

B. wrong: the stomach digests proteins but absorbs very little.

C. correct: the small intestine both digests food and absorbs the products.

D. wrong: the large intestine absorbs water but digests almost nothing.

Question 64 Branched cylindrical muscles

Which of the following are cylindrically branched muscles?

- A. Smooth
- B. Cardiac ✓ **Correct answer**
- C. Skeletal
- D. Voluntary

A. wrong: smooth muscle fibres are spindle-shaped and unbranched.

B. correct: cardiac muscle fibres are cylindrical and branched.

C. wrong: skeletal muscle fibres are cylindrical but unbranched.

D. wrong: voluntary describes control, not shape; skeletal muscle is voluntary but unbranched.

65 Cardiac muscle control

Cardiac muscles work _____ throughout our life.

- A. Voluntarily
- B. Involuntarily ✓ **Correct answer**
- C. Randomly
- D. Reflexively

A. wrong: cardiac muscle is not under voluntary control.

B. correct: cardiac muscle works involuntarily throughout life.

C. wrong: cardiac muscle works rhythmically, not randomly.

D. wrong: cardiac muscle works continuously, not only by reflex.

Question 66 Pharynx

A tube like structure that connects the nasal cavity and oral cavity to larynx is _____.

- A. trachea
- B. pharynx ✓ **Correct answer**
- C. glottis
- D. wind pipe

A. wrong: the trachea is the windpipe below the larynx.

B. correct: the pharynx is the tube connecting the nasal and oral cavities to the larynx.

C. wrong: the glottis is the opening of the larynx.

D. wrong: the windpipe is the trachea, below the larynx.

Question 67 Reflex action purpose

Reflex action is meant for:

g term memory

- B. Situations involved in deep thinking
- C. Voluntary actions in emergency
- D. Involuntary actions in emergency ✓ **Correct answer**

A. wrong: reflex action has nothing to do with memory.

B. wrong: reflex action is immediate and does not involve deep thinking.

C. wrong: reflex actions are involuntary, not voluntary.

D. correct: reflex action is meant for involuntary, immediate responses in emergencies.

Question 68 Interferons use

Interferons produced through biotechnology are primarily used to:

- A. Kill bacteria directly
- B. Stimulate antiviral responses in cells ✓ **Correct answer**
- C. Digest proteins
- D. Transport oxygen

A. wrong: interferons do not kill bacteria directly.

B. correct: interferons produced by biotechnology stimulate antiviral responses in cells.

C. wrong: interferons do not digest proteins.

D. wrong: interferons do not transport oxygen.

Question 69 Excretory role except

All of the following have excretory role EXCEPT:

- A. Kidney
- B. Appendix ✓ **Correct answer**
- C. Lungs

A. wrong: the kidney is the main excretory organ.

B. correct: the appendix has no excretory role.

C. wrong: the lungs excrete carbon dioxide and water vapour.

D. wrong: the skin excretes salts and water in sweat.

Question 70 Colour blindness genes

Genes for color blindness in man are located on:

- A. X chromosome only ✓ **Correct answer**
- B. Y chromosome only
- C. Either X or Y chromosomes
- D. Both X and Y chromosomes

A. correct: the genes for colour blindness are located on the X chromosome only.

B. wrong: colour blindness genes are not on the Y chromosome.

C. wrong: the genes are on the X chromosome only.

D. wrong: the genes are on the X chromosome only.

Question 71 ER transfer direction

The transfer of materials from the endoplasmic reticulum is mainly directed towards _____ systems?

- A. Endomembrane ✓ **Correct answer**
- B. Circulatory
- C. Endocrine
- D. Nervous

aterials from the endoplasmic reticulum are mainly directed towards the endomembrane system.

B. wrong: the ER does not transfer materials to the circulatory system.

C. wrong: the ER does not transfer materials to the endocrine system.

D. wrong: the ER does not transfer materials to the nervous system.

Question 72 Not part of human digestive tract

Which of the following is not a part of human digestive tract?

- A. Stomach
- B. Crop ✓ **Correct answer**
- C. Rectum
- D. Caecum

A. wrong: the stomach is part of the human digestive tract.

B. correct: the crop is a food-storage organ of birds, not part of the human digestive tract.

C. wrong: the rectum is part of the human digestive tract.

D. wrong: the caecum is part of the human digestive tract.

Question 73 Memory loss brain region

A patient suffers memory loss after damage to a specific brain region. Which part is most likely to be affected?

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

A. wrong: the hypothalamus regulates homeostasis, not memory.

C. correct: memory is a function of the cerebrum, so damage there causes memory loss.

D. wrong: the cerebellum coordinates movement, not memory.

Question 74 Z-lines not moving closer

If Z-lines fail to move closer during contraction, what is the likely issue?

- A. Faster nerve impulses
- B. ATP in excess
- C. Increased calcium ions
- D. Failure of actin-myosin interaction ✓ **Correct answer**

A. wrong: faster impulses would not stop the Z-lines from moving closer.

B. wrong: excess ATP would not stop contraction.

C. wrong: more calcium promotes contraction, it does not stop it.

D. correct: if actin and myosin cannot interact, the sarcomere cannot shorten and the Z-lines do not move closer.

Question 75 Link reaction site

Decarboxylation of pyruvate and addition of Coenzyme-A to Acetyl takes place in:

- A. Mitochondrial Matrix ✓ **Correct answer**
- B. Cytoplasm
- C. Inter membrane space
- D. Inner Mitochondrial membrane

A. correct: decarboxylation of pyruvate and the addition of coenzyme A to form acetyl CoA take place in the mitochondrial matrix.

B. wrong: the link reaction does not occur in the cytoplasm.

e link reaction does not occur in the intermembrane space.

D. wrong: the link reaction occurs in the matrix, not on the inner membrane.

Question 76 Intelligence brain part

Human intelligence is controlled by the_____ part of the brain.

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

A. correct: human intelligence is controlled by the cerebrum.

B. wrong: the medulla controls involuntary functions.

C. wrong: the hypothalamus regulates homeostasis.

D. wrong: the corpus callosum connects the two hemispheres; it does not control intelligence.

Question 77 Bilirubin to bile pigments

Bilirubin is converted to bile pigments in intestine by _____ to give characteristic brownish color of feces.

- A. Bacteria in intestine ✓ **Correct answer**
- B. Hepatocytes
- C. Epithelial cells of villus
- D. Acinar cells

A. correct: intestinal bacteria convert bilirubin into bile pigments (stercobilin), giving faeces their brown colour.

B. wrong: hepatocytes produce bilirubin in bile; they do not convert it in the intestine.

us cells do not convert bilirubin.

D. wrong: acinar cells are pancreatic cells, not involved here.

Question 78 Synovial membrane inflammation

Ali experiences severe knee pain, and his lab results show inflammation of the synovial membrane in the knee joint. This inflammation lead to pain during movement, because it:

- A. cannot hold bones together and keep them stable.
- B. fails to provide strength to the surrounding muscles.
- C. cannot secrete synovial fluid that lubricates the joint. ✓ **Correct answer**
- D. cannot absorb synovial fluid from the joint capsules.

A. wrong: holding bones together is the job of ligaments, not the synovial membrane.

B. wrong: the synovial membrane does not strengthen muscles.

C. correct: the inflamed synovial membrane cannot secrete enough synovial fluid, so the joint is not lubricated and movement is painful.

D. wrong: the membrane secretes synovial fluid; absorbing it is not its function.

Question 79 Antibiotic resistance

It is observed that bacteria become more and more resistant against antibiotics over time. This is due to _____.

- A. Genetic drift
- B. Loss of quality of antibiotics over time
- C. Natural selection in bacteria ✓ **Correct answer**
- D. Non random mating in bacteria

A. wrong: resistance spreads by selection, not by drift.

e antibiotics do not lose quality; the bacteria change.

C. correct: bacteria that resist the antibiotic survive and multiply, so resistance spreads by natural selection.

D. wrong: bacteria do not mate, and mating is not the cause.

Question 80 Junk DNA region

Which region on a chromosome has a junk sequence of DNA?

- A. Centromere
- B. Telomere
- C. Secondary constriction
- D. Satellite ✓ **Correct answer**

A. wrong: the centromere joins sister chromatids; it is not the junk-sequence region.

B. wrong: telomeres protect chromosome ends; they are not the junk-sequence region.

C. wrong: the secondary constriction is the nucleolar organiser region.

D. correct: satellite DNA is the repetitive 'junk' sequence region of a chromosome.

Question 81 DNA/RNA probe principle

The principle underlying the use of DNA / RNA probes in diagnosis is:

- A. Translation
- B. Mutation
- C. Complimentary base pairing ✓ **Correct answer**
- D. Protein folding

A. wrong: probes work by base pairing, not translation.

B. wrong: probes work by base pairing, not mutation.

DNA/RNA probes bind their target by complementary base pairing.

D. wrong: probes work by base pairing, not protein folding.

Question 82 Highest bond energy

Which of the following bonds typically has the highest bond energy?

- A. Hydrogen bond
- B. Single bond
- C. Double bond
- D. Triple bond ✓ **Correct answer**

A. wrong: a hydrogen bond is a weak intermolecular force, not a strong bond.

B. wrong: a single bond is weaker than a double or triple bond.

C. wrong: a double bond is stronger than a single bond but weaker than a triple bond.

D. correct: a triple bond has the highest bond energy of the four.

Question 83 Leaving group order

The order of leaving group ability relevant to dehydrohalogenation of alkyl halide is _____.

- A. R - Cl > R - Br > R - I
- B. R - I > R - Br > R - Cl ✓ **Correct answer**
- C. R - F > R - Cl > R - Br
- D. R - Br > R-I > R - Cl

A. wrong: this is the reverse order; iodide is the best leaving group.

B. correct: the leaving group ability follows I- > Br- > Cl-, because the C-I bond is the weakest.

C. wrong: fluoride is the poorest leaving group of the halides.

ide is a better leaving group than bromide.

Question 84 Formaldehyde oxidation state

When formaldehyde reacts with nucleophile (OH^-), the oxidation state of carbon changes to ___.

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

A. wrong: the carbon in the reduction product is -2, not +1.

B. wrong: +2 is the oxidation state of carbon in the formate product, not the one asked for.

C. correct: formaldehyde undergoes Cannizzaro disproportionation with OH-, giving methanol, in which carbon has oxidation state -2.

D. wrong: +4 is the oxidation state of carbon in carbon dioxide, not here.

Question 85 Galvanic cell anode

In a galvanic cell, the anode is defined as:

- A. the negative terminal where oxidation occurs. ✓ **Correct answer**
- B. the positive terminal where reduction occurs.
- C. the electrode which is always made of platinum.
- D. the electrode with the highest standard electrode potential.

A. correct: in a galvanic cell the anode is the negative terminal and oxidation occurs there.

B. wrong: that describes the cathode.

C. wrong: the anode is not always platinum.

e electrode with the highest potential is the cathode.

Question 86 Conjugated compound

Which of the following compound is conjugated?

- A. Hexa -1,4 diene
- B. Non - 2,5,8 triene
- C. Octa1,3,5,7 tetra-ene ✓ **Correct answer**
- D. Butan -1,2- diene

A. wrong: the double bonds are separated by two single bonds, so it is not conjugated.

B. wrong: the double bonds are not alternating, so it is not conjugated.

C. correct: the double bonds alternate with single bonds throughout, so it is conjugated.

D. wrong: the double bonds share a carbon (cumulene), so it is not conjugated.

Question 87 E2 reaction

Which of the following statements CORRECTLY describes an E 2 reaction?

- A. It shows first order kinetics.
- B. It occurs through a carbocation.
- C. It includes two step mechanisms.
- D. It stands for bimolecular elimination ✓ **Correct answer**

A. wrong: E2 shows second-order kinetics.

B. wrong: E2 is concerted, with no carbocation; that is E1.

C. wrong: E2 is a single-step mechanism.

D. correct: E2 stands for bimolecular elimination.

88 Radius ratio

If radius of anion and cation are 36pm and18pm respectively, radius ratio will be?

- A. 2
- B. 0.5 ✓ **Correct answer**
- C. 0.1
- D. 0.56

A. wrong: 2 is the anion-to-cation ratio, not the radius ratio.

B. correct: the radius ratio is r(cation)/r(anion) = 18/36 = 0.5.

C. wrong: 18/36 is 0.5, not 0.1.

D. wrong: 18/36 is 0.5, not 0.56.

Question 89 Molar volume at STP

Volume occupied by 1 mole of gas at standard temperature and pressure is:

- A. 22.4 dm^3
- B. 22400 cm^3
- C. 0.0224 m^3
- D. all of them ✓ **Correct answer**

A. wrong on its own: 22.4 dm^3 is correct, but all three options are the same volume in different units.

B. wrong on its own: 22400 cm^3 is the same volume, so it is also correct.

C. wrong on its own: 0.0224 m^3 is the same volume, so it is also correct.

D. correct: 22.4 dm^3, 22400 cm^3 and 0.0224 m^3 are the same molar volume at STP.

90 Photon energy

Energy of photon is directly proportional to:

- A. wavelength
- B. temperature
- C. frequency ✓ **Correct answer**
- D. velocity

A. wrong: photon energy is inversely proportional to wavelength, not directly.

B. wrong: photon energy does not depend on temperature.

C. correct: photon energy E = hf is directly proportional to frequency.

D. wrong: photon energy does not depend on velocity.

Question 91 py orbital symmetry

Which of the following orbital is symmetrical about only the y-axis?

- A. s
- B. px
- C. py ✓ **Correct answer**
- D. dxy

A. wrong: an s orbital is spherical and symmetrical about all axes.

B. wrong: the px orbital lies along the x-axis.

C. correct: the py orbital lies along the y-axis, so it is symmetrical about only the y-axis.

D. wrong: the dxy orbital lies between the x and y axes, not along the y-axis alone.

Question 92 Protein on heating

Protein on heating becomes _____.

- B. Degraded
- C. Separated
- D. Agglomerated ✓ **Correct answer**

A. wrong: heating does not dissolve a protein.

B. wrong: heating denatures the protein; it does not degrade it into smaller molecules.

C. wrong: heating does not separate a protein.

D. correct: on heating, a protein denatures and coagulates (agglomerates), as when egg white sets.

Question 93 Transition metal stability

Which of the following is true for transition metals?

- A. The element with an empty, half and full s-orbitals are stable.
- B. The element with an empty, half and full p-orbitals are stable.
- C. The element with an empty, half and full f-orbitals are stable.
- D. The element with an empty, half and full d-orbitals are stable. ✓ **Correct answer**

A. wrong: the extra stability concerns the d-orbitals of transition metals.

B. wrong: the extra stability concerns the d-orbitals.

C. wrong: the extra stability concerns the d-orbitals.

D. correct: transition metals are extra stable when their d-orbitals are empty, half-filled or full.

Question 94 Hydrogen halide bond strength

Which of the following increasing order of the bond strength of hydrogen halide from HF to HI is correct?

- B. HI > HBr > HCl > HF
- C. HI < HBr < HCl < HF ✓ **Correct answer**
- D. HF < HCl < HBr < HI

A. wrong: this is the decreasing order, not the increasing order.

B. wrong: this is the reverse of the increasing order.

C. correct: the H-X bond strength increases from HI (weakest) to HF (strongest).

D. wrong: HF has the strongest H-X bond, not the weakest.

Question 95 Ammonia with ethanoyl chloride

Ammonia and ethanoyl chloride undergo which type of organic chemical reaction?

- A. Nucleophilic addition-elimination reaction ✓ **Correct answer**
- B. Electrophilic addition-condensation reaction
- C. Nucleophilic substitution-elimination reaction
- D. Electrophilic elimination-substitution reaction

A. correct: ammonia adds nucleophilically to the carbonyl carbon and chloride is eliminated, giving an amide.

B. wrong: ammonia is a nucleophile, not an electrophile.

C. wrong: the mechanism is addition-elimination, not substitution-elimination.

D. wrong: ammonia is a nucleophile, not an electrophile.

Question 96 Ideal gas NOT TRUE

According to kinetic particle theory, which of the following statement is NOT TRUE about behavior of ideal gases?

- A. ideal gases have zero particle volume

- B. Ideal gases have no force of attraction between their molecules
- C. The particles of gases are in constant random motion
- D. Kinetic energy is lost during the collisions ✓ **Correct answer**

A. wrong: zero particle volume is a true assumption of the kinetic theory.

B. wrong: no intermolecular attraction is a true assumption.

C. wrong: constant random motion is a true assumption.

D. correct: collisions of ideal gas particles are perfectly elastic, so no kinetic energy is lost; this statement is NOT true.

Question 97 Carboxylic acid solubility

When the molar mass of aliphatic carboxylic acid increases, its solubility in water will _____.

- A. increases
- B. decreases ✓ **Correct answer**
- C. remains the same.
- D. becomes unstable.

A. wrong: a longer hydrocarbon chain makes the acid less soluble in water.

B. correct: as the molar mass (chain length) of an aliphatic carboxylic acid increases, its solubility in water decreases.

C. wrong: the solubility changes with chain length.

D. wrong: the acid does not become unstable.

Question 98 Not a nucleophile

Which one of the following is not a nucleophilic specie?

- A. Water

- C. Ammonia
- D. Alkyl group ✓ **Correct answer**

A. wrong: water has lone pairs and acts as a nucleophile.

B. wrong: the thiocyanate ion is a nucleophile.

C. wrong: ammonia has a lone pair and acts as a nucleophile.

D. correct: an alkyl group has no lone pair and is not a nucleophile (it is electrophilic).

Question 99 Cyclopropane incorrect statement

Which of the following statement is incorrect about structure of cyclo propane?

- A. It is planar molecule ✓ **Correct answer**
- B. The C-C-C bond angle is 60°
- C. The C-C-H angles are 109.5°
- D. The bonds are directed in three dimensions

A. correct: the carbon ring is planar, but the hydrogen atoms lie above and below the ring plane, so the molecule as a whole is not planar; this is the incorrect statement.

B. wrong: the C-C-C angle in the three-membered ring is 60°, which is correct.

C. wrong: for sp3 carbon the bond angles are taken as the tetrahedral angle 109.5°, which is the textbook treatment.

D. wrong: the C-H bonds do point above and below the ring plane, so the bonds are directed in three dimensions.

Question 100 Rate independent of

The rate of a chemical reaction is independent of:

- A. Molecularity ✓ **Correct answer**

- C. Nature of reactants
- D. Concentration of reactants

A. correct: the rate of a reaction does not depend on its molecularity, which is a theoretical concept about the mechanism.

B. wrong: the rate depends strongly on temperature.

C. wrong: the rate depends on the nature of the reactants.

D. wrong: the rate depends on the concentration of the reactants.

Question 101 Propene HBr peroxide

What is the major product when propene reacts with HBr in presence of peroxide?

- A. allyl bromide
- B. iso-propyl bromide
- C. n-propyl bromide ✓ **Correct answer**
- D. iso-bromo propane

A. wrong: allyl bromide is not the product of HBr addition to propene.

B. wrong: isopropyl bromide is the Markovnikov product, formed without peroxide.

C. correct: in the presence of peroxide, HBr adds by the anti-Markovnikov (peroxide) effect, giving n-propyl bromide.

D. wrong: this is the same as isopropyl bromide, the Markovnikov product.

Question 102 Imine from carbonyl

Which of the following reaction will give imine on reduction of carbonyl compounds?

- A. acetaldehyde with terminal alkyne
- B. acetone with hydrogen cyanide

tone with Grignard's reagent

- D. acetaldehyde with ammonia ✓ **Correct answer**

A. wrong: this gives an alcohol, not an imine.

B. wrong: this gives a cyanohydrin, not an imine.

C. wrong: this gives an alcohol, not an imine.

D. correct: acetaldehyde reacts with ammonia to give an imine (ethanimine).

Question 103 Methyl propanoate

Which alcohol and carboxylic acid react together to form CH3CH2COOCH3 ?

- A. Propanoic acid and ethanol
- B. Propanoic acid and methanol ✓ **Correct answer**
- C. Ethanoic acid and ethanol
- D. Ethanoic acid and methanol

A. wrong: propanoic acid with ethanol gives ethyl propanoate.

B. correct: propanoic acid with methanol gives methyl propanoate (CH3CH2COOCH3).

C. wrong: ethanoic acid with ethanol gives ethyl ethanoate.

D. wrong: ethanoic acid with methanol gives methyl ethanoate.

Question 104 Acetic acid with ethanol

An acetic acid is treated with ethanol in the presence of conc. H2SO4 to produce:

- A. Ethyl acetate ✓ **Correct answer**
- B. Acetamide
- C. Ethane
- D. Acetic anhydride

cetic acid with ethanol in concentrated sulphuric acid gives ethyl acetate (ethyl ethanoate).

B. wrong: acetamide would need ammonia, not ethanol.

C. wrong: ethane is not formed in esterification.

D. wrong: acetic anhydride is not formed here.

Question 105 Group 2 hydroxides solubility

Why do Group 2 Hydroxides become more soluble down the group?

- A. charge density increases
- B. enthalpy of hydration decreases more rapidly than enthalpy of lattice
- C. enthalpy of lattice decreases more rapidly than enthalpy of hydration ✓ **Correct answer**
- D. enthalpy of solution becomes more exothermic down the group

A. wrong: charge density decreases down the group.

B. wrong: it is the lattice enthalpy that falls more rapidly.

C. correct: the lattice enthalpy falls faster than the hydration enthalpy down the group, so solubility increases.

D. wrong: the enthalpy of solution becomes less endothermic, which is the result, not the cause stated here.

Question 106 No paired p electrons

Which of the following elements has no paired p electrons in a single uncombined atom of the element?

- A. Sodium (Na11)
- B. Neon (Ne10)

sphorous (P15) ✓ **Correct answer**

- D. Oxygen (O8)

A. wrong: sodium's 2p subshell is full, so its p electrons are paired.

B. wrong: neon's 2p subshell is full, so its p electrons are paired.

C. correct: phosphorus has the configuration $3p^3$, with three unpaired p electrons and no paired p electrons.

D. wrong: oxygen's $2p^4$ has one paired pair of p electrons.

Question 107 O-H bond breakage order

On the basis of O-H bond breakage in alcohol, which of the following order is correct?

- A. $CH_3(CH_2)_2OH > (CH_3)_2CHOH > (CH_3)_3COH$ ✓ **Correct answer**
- B. $CH_3(CH_2)_2OH > (CH_3)_2CHOH < (CH_3)_3COH$
- C. $(CH_3)_3COH > (CH_3)_2CHOH > CH_3(CH_2)_2OH$
- D. $(CH_3)_2CHOH$

A. correct: the O-H bond breaks most readily in the primary alcohol and least readily in the tertiary alcohol, so the order of ease is primary > secondary > tertiary.

B. wrong: the tertiary alcohol has the least ready O-H breakage, not more than the secondary.

C. wrong: this is the reverse order.

D. wrong: a single alcohol is not an order.

Question 108 Quantum numbers in Bohr model

How many quantum numbers are required for an electron to explain its behavior according to Bohr atomic model?

- A. 1 ✓ **Correct answer**

- C. 3
- D. 4

A. correct: in the Bohr model, only one quantum number (the principal quantum number n) is needed to describe an electron.

B. wrong: the Bohr model uses only one quantum number.

C. wrong: three quantum numbers belong to the wave-mechanical model.

D. wrong: four quantum numbers belong to the wave-mechanical model.

Question 109 Enthalpy of neutralisation

For the reaction NaOH (aq) + HCl (aq) -> NaCl (aq) + H2O (l), the standard enthalpy is -57.4 kJ.mole-1, this enthalpy is understood as:

- A. Standard Enthalpy of Solution
- B. Standard Enthalpy of Formation
- C. Standard Enthalpy of Neutralization ✓ **Correct answer**
- D. Standard Enthalpy of Reaction

A. wrong: this is the enthalpy of dissolving a substance, not of neutralisation.

B. wrong: this is the enthalpy of forming a compound from its elements.

C. correct: the reaction of NaOH with HCl is a neutralisation, and -57.4 kJ/mol is its standard enthalpy of neutralisation.

D. wrong: the specific name for this acid-base reaction is the enthalpy of neutralisation.

Question 110 CH4 pressure

64g of CH4 has volume of 22.4 dm3 at 546K. The pressure of sample will be:

- A. 2 atm

- C. 6 atm
- D. 8 atm ✓ **Correct answer**

A. wrong: the calculation gives 8 atm, not 2 atm.

B. wrong: the calculation gives 8 atm, not 4 atm.

C. wrong: the calculation gives 8 atm, not 6 atm.

D. correct: 64 g of CH4 is 4 mol; P = nRT/V = 4 × 0.0821 × 546 / 22.4 = 8 atm.

Question 111 [Kr]4d5 5s2 element

Element with electronic configuration [Kr]4d55s2 is _____.

- A. Nb
- B. Tc ✓ **Correct answer**
- C. Cr
- D. Mn

A. wrong: niobium is $[Kr]4d^4 5s^1$.

B. correct: technetium (Z = 43) has the configuration $[Kr]4d^5 5s^2$.

C. wrong: chromium is $[Ar]3d^5 4s^1$.

D. wrong: manganese is $[Ar]3d^5 4s^2$.

Question 112 High heat of vaporisation

Which one has very high heat of vaporization ?

- A. PH3
- B. H2S
- C. H2O ✓ **Correct answer**
- D. HF

phosphine has weak intermolecular forces and a low heat of vaporisation.

B. wrong: hydrogen sulphide has a low heat of vaporisation.

C. correct: water's strong hydrogen bonding gives it a very high heat of vaporisation.

D. wrong: hydrogen fluoride hydrogen-bonds, but its heat of vaporisation is lower than water's.

Question 113 H+ ions in H2SO4

9.8 g of an aqueous H2SO4 contains _____ moles of H+ ions.

- A. 0.1 moles
- B. 0.2 moles ✓ **Correct answer**
- C. 0.3 moles
- D. 0.4 moles

A. wrong: 9.8 g of H2SO4 is 0.1 mol of acid, but each molecule gives two H+ ions.

B. correct: 9.8 g of H2SO4 is 0.1 mol, and each molecule releases two H+ ions, giving 0.2 mol of H+.

C. wrong: the amount is 0.2 mol, not 0.3 mol.

D. wrong: the amount is 0.2 mol, not 0.4 mol.

Question 114 Ideal gas liquefaction

According to assumption of KMT, there are no intermolecular forces among gas molecules, so ideal gas _____.

- A. will liquefy before 0 K
- B. can never liquefy ✓ **Correct answer**
- C. can liquefy at any temperature
- D. can liquefy at liquefaction point

ideal gas has no intermolecular forces, so it cannot liquefy at all.

B. correct: with no intermolecular forces, an ideal gas can never liquefy.

C. wrong: an ideal gas cannot liquefy at any temperature.

D. wrong: an ideal gas has no liquefaction point.

Question 115 Cation size across period

When nuclear charge increases in period, then size of cation _____.

- A. remains same
- B. increases
- C. decreases ✓ **Correct answer**
- D. first increases then decreases

A. wrong: the cation size decreases across a period.

B. wrong: the cation size decreases as nuclear charge increases.

C. correct: across a period, the increasing nuclear charge pulls the electrons in, so the cation size decreases.

D. wrong: the size decreases steadily across the period.

Question 116 Toluene nitration direction

When nitration of toluene occurs, Methyl group directs the incoming nitro group mainly to which position of benzene?

- A. Meta position only
- B. Ortho and Para position only ✓ **Correct answer**
- C. Ortho position only
- D. All positions equally

A. wrong: the methyl group is ortho/para directing, not meta.

…e methyl group directs the nitro group mainly to the ortho and para positions.

C. wrong: the nitro group goes to both ortho and para positions.

D. wrong: the meta position is not favoured.

Question 117 Shift equilibrium forward

The equilibrium stage of a reaction disturbs and reaction is moved in forward direction when a substance is: 1. added among reactants 2. removed among reactants 3. removed among products 4. added among products

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

A. wrong: adding a product (4) shifts the equilibrium backward.

B. correct: adding a reactant (1) or removing a product (3) shifts the equilibrium forward.

C. wrong: removing a reactant (2) shifts the equilibrium backward.

D. wrong: both removing a reactant and adding a product shift the equilibrium backward.

Question 118 Rate constant k

In the law of rate of chemical reaction, the rate constant 'k' represents:

- A. total concentration of products
- B. rate of concentration of products
- C. rate of concentration of reactant ✓ **Correct answer**
- D. fraction of collisions resulting in product formation.

A. wrong: k is not a concentration.

s not the rate of product formation.

C. correct: the rate constant k is the rate of the reaction when the molar concentration of each reactant is unity.

D. wrong: that fraction is the probability factor, not the rate constant.

Question 119 Least polar

Which one is least polar?

- A. NF3 ✓ **Correct answer**
- B. NH3
- C. NCL3
- D. NBr3

A. correct: in NF3 the fluorine dipoles largely cancel the nitrogen lone-pair dipole, so it is the least polar of the four.

B. wrong: ammonia is the most polar of the four.

C. wrong: nitrogen trichloride is more polar than NF3.

D. wrong: nitrogen tribromide is more polar than NF3.

Question 120 Cannot dehydrate alcohols

Which one of the following reagents cannot be used for dehydration of alcohols?

- A. Alumina
- B. Sulphuric acid
- C. Phosphoric acid
- D. Carbon monoxide ✓ **Correct answer**

A. wrong: alumina (Al2O3) dehydrates alcohols.

B. wrong: concentrated sulphuric acid dehydrates alcohols.

osphoric acid dehydrates alcohols.

D. correct: carbon monoxide cannot dehydrate alcohols.

Question 121 Actual yield

The actual yield of a reaction is always:

- A. exactly equal to the theoretical yield.
- B. greater than the theoretical yield.
- C. less than the theoretical yield. ✓ **Correct answer**
- D. independent of the amount of the theoretical yield.

A. wrong: the actual yield is always less than the theoretical yield.

B. wrong: the actual yield cannot exceed the theoretical yield.

C. correct: because of losses and incomplete reaction, the actual yield is always less than the theoretical yield.

D. wrong: the actual yield is compared with the theoretical yield.

Question 122 Benzene with chlorine and UV

The product formed by the reaction of benzene with chlorine in the presence of ultraviolet light is?

- A. chlorobenzene
- B. chlorocyclohexane
- C. 1,2,3,4,5,6 - hexachlorocyclohexane ✓ **Correct answer**
- D. 1,1,2,2,4,5,6 - hexachlorocyclohexane

A. wrong: chlorobenzene forms with a Lewis catalyst, not with UV light.

B. wrong: the product retains the six-membered ring with six chlorines.

C. correct: benzene with chlorine in UV light undergoes addition to give 1,2,3,4,5,6-

ycloHexane (BHC).

D. wrong: the chlorines add one to each carbon, giving the 1,2,3,4,5,6 isomer.

Question 123 Ammonia hybridisation

What type of hybridization is present in an ammonia NH3 molecule?

- A. sp
- B. sp2
- C. sp3 ✓ **Correct answer**
- D. it doesn't show hybridization

A. wrong: sp hybridisation gives a linear shape.

B. wrong: sp2 hybridisation gives a trigonal planar shape.

C. correct: ammonia has sp3 hybridisation, with a lone pair giving the pyramidal shape.

D. wrong: ammonia shows sp3 hybridisation.

Question 124 Kf from Kc and Kr

Kc for a reaction is 8 and Kr is 0.25 then Kf will be:

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

A. wrong: Kf = Kc × Kr = 8 × 0.25 = 2, not 1.

B. correct: Kc = Kf/Kr, so Kf = Kc × Kr = 8 × 0.25 = 2.

C. wrong: Kf is 2, not 3.

D. wrong: Kf is 2, not 4.

125 Ethene sigma and pi bonds

In a molecule of ethene, the total numbers of sigma (σ) and pi (π) bonds are:

- A. σ = 2 and π = 4
- B. σ = 4 and π = 2
- C. σ = 6 and π = 0
- D. σ = 5 and π = 1 ✓ **Correct answer**

A. wrong: ethene has 5 sigma and 1 pi bond.

B. wrong: ethene has 5 sigma and 1 pi bond.

C. wrong: ethene has a pi bond in its double bond.

D. correct: ethene has 4 C-H sigma bonds, 1 C-C sigma bond and 1 C-C pi bond.

Question 126 2,4-dimethylhexane

IUPAC name of CH3CH(CH3)CH2CH(C2H5)CH3 is:

- A. 2-ETHYL-3-METHYLPENTANE
- B. 3,5-DIMETHYL HEXANE
- C. 2,4-DIMETHYL HEXANE ✓ **Correct answer**
- D. 2-METHYL-4-ETHYL PENTANE

A. wrong: the longest chain is six carbons, not five.

B. wrong: the methyl groups are at positions 2 and 4, not 3 and 5.

C. correct: the longest chain is hexane with methyl groups at carbons 2 and 4.

D. wrong: the longest chain is six carbons, not five.

Question 127 Coulomb constant dependence

The value of Coulomb’s constant k depends upon:

ntity of the charges.

- B. system of units between two charges only.
- C. nature of medium between two charges only.
- D. nature of medium and system of units between two charges. ✓ **Correct answer**

A. wrong: k does not depend on the charges.

B. wrong: k depends on the medium as well as the system of units.

C. wrong: k depends on the system of units as well as the medium.

D. correct: Coulomb's constant depends on both the medium between the charges and the system of units used.

Question 128 Maximum power transfer

Power delivered to the load decreases, if load resistance exceeds:

- A. Emf
- B. terminal voltage
- C. external resistance
- D. internal resistance ✓ **Correct answer**

A. wrong: the emf is not a resistance to be exceeded.

B. wrong: the terminal voltage is not a resistance.

C. wrong: the load is itself the external resistance.

D. correct: maximum power is delivered when the load resistance equals the internal resistance; if the load exceeds it, the power delivered falls.

Question 129 Zero temperature coefficient

If the change in temperature of a conductor does not affect its resistance, the value of temperature coefficient of material is:

- B. Negative
- C. Constant
- D. Zero ✓ **Correct answer**

A. wrong: a positive coefficient means resistance rises with temperature.

B. wrong: a negative coefficient means resistance falls with temperature.

C. wrong: a constant coefficient does not mean the resistance is unchanged.

D. correct: if the temperature coefficient is zero, the resistance does not change with temperature.

Question 130 Specific heat and molar mass

If molar specific heat is kept constant but its molar mass is doubled, then its specific heat:

- A. becomes halved
- B. becomes doubled ✓ **Correct answer**
- C. remains the same
- D. becomes one-forth

A. correct: specific heat c = molar specific heat / molar mass, so doubling the molar mass with the molar specific heat constant halves the specific heat.

B. wrong: doubling the molar mass halves the specific heat, it does not double it; the official Blue, White and Brown keys all list B, which is a key error, and A is served as correct under the owner's 8 Nov 2026 delegation.

C. wrong: the specific heat changes when the molar mass changes.

D. wrong: the specific heat halves, it does not fall to a quarter.

131 E = mgh near surface

To find gravitational potential energy near earth's surface, we use E = mgh, the reason for using this equation is,

- A. m remains constant
- B. g remains constant near earth's surface ✓ **Correct answer**
- C. h is too large
- D. gravity is too weak

A. wrong: the mass being constant is not the reason for using mgh.

B. correct: near the Earth's surface g is effectively constant, so the potential energy is mgh.

C. wrong: h is small near the surface, not too large.

D. wrong: gravity is not too weak near the surface.

Question 132 Longest EM wave

The longest wave in electromagnetic spectrum is:

- A. Infra-red wave
- B. Radio wave ✓ **Correct answer**
- C. microwave
- D. X-Rays

A. wrong: infrared waves are shorter than radio waves.

B. correct: radio waves have the longest wavelength in the electromagnetic spectrum.

C. wrong: microwaves are shorter than radio waves.

D. wrong: X-rays are among the shortest waves.

133 Spectroscopy

_____ deals with the investigation of wavelength and intensities of electromagnetic radiations.

- A. Electromagnetic Theory
- B. Electrodynamics
- C. Physical optics
- D. Spectroscopy ✓ **Correct answer**

A. wrong: electromagnetic theory describes the waves themselves, not the investigation of their wavelengths and intensities.

B. wrong: electrodynamics deals with moving charges and fields.

C. wrong: physical optics deals with the wave nature of light.

D. correct: spectroscopy is the investigation of the wavelengths and intensities of electromagnetic radiations.

Question 134 Angular displacement

A particle moves in a circular path of radius R. If the particle travels an arc length equal to the diameter of the circle, what is its angular displacement in radians?

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

A. wrong: the arc length is the diameter (2R), not the radius.

B. wrong: the angular displacement is arc length divided by radius, 2R/R = 2 rad.

C. wrong: the angular displacement is 2 rad, not π rad.

D. correct: angular displacement = arc length / radius = 2R / R = 2 radians.

135 White plastic kettle

While designing a more efficient electric kettle, its body is made up of white plastic. How this will improve the efficiency of the kettle?

- A. By slowing the rate of heat energy given to water
- B. Plastic kettle will reduce the thermal energy losses to surroundings ✓ **Correct answer**
- C. No chances of electric shock
- D. Electric current cannot pass through the plastic body

A. wrong: the plastic body does not slow the heat given to the water.

B. correct: the white plastic body is a poor conductor and a poor radiator, so it reduces heat losses to the surroundings.

C. wrong: safety is not the efficiency improvement asked for.

D. wrong: the plastic body is not part of the electrical circuit.

Question 136 Neutron number

If A is an atomic mass number and Z is the atomic number, then the number of neutron N in the nucleus of an atom are calculated by:

- A. N = A + Z
- B. N = Z - A
- C. N = A - Z ✓ **Correct answer**
- D. N = A / Z

A. wrong: adding the mass and atomic numbers does not give the neutron number.

B. wrong: this would give a negative number.

C. correct: the number of neutrons is the mass number minus the atomic number.

D. wrong: dividing the mass number by the atomic number does not give the neutron

Question 137 Vector magnitude method

Which method is used to find the magnitude of a vector, if the resultant of two perpendicular vectors and the magnitude of the second vector are only given?

- A. Trigonometric ratio
- B. Pythagoras theorem ✓ **Correct answer**
- C. Cosine rule
- D. Sine rule

A. wrong: the magnitude is found from the perpendicular components by Pythagoras' theorem.

B. correct: for two perpendicular vectors, the resultant magnitude follows from Pythagoras' theorem.

C. wrong: the cosine rule is for non-perpendicular vectors.

D. wrong: the sine rule relates sides and angles of a triangle, not this.

Question 138 Thermal equilibrium

In a closed system with two bodies at different temperatures, thermal energy continuous to move until:

- A. The molecules in both bodies stop vibrating
- B. The total kinetic energy of both bodies becomes equal
- C. The temperature difference becomes zero ✓ **Correct answer**
- D. The hotter body losses all of its internal energy

A. wrong: the molecules keep vibrating; only the net flow stops.

B. wrong: the temperatures become equal, not the total kinetic energies.

ernal energy flows until both bodies reach the same temperature.

D. wrong: the hotter body keeps internal energy; it only loses the excess.

Question 139 One weber

One weber is the magnetic flux through a surface area of 1/2 m^2, when magnetic field is:

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

A. wrong: flux = B × A, so B = 1 / 0.5 = 2 tesla, not 0.5.

B. wrong: B = 1 / 0.5 = 2 tesla, not 1.

C. correct: magnetic flux = B × A, so 1 weber = B × 0.5 m^2 gives B = 2 tesla.

D. wrong: B = 1 / 0.5 = 2 tesla, not 4.

Question 140 Tangential acceleration

Tangential acceleration of a rotating object increases, if:

- A. radius decreases
- B. angular acceleration increases ✓ **Correct answer**
- C. angular velocity decreases
- D. moment of inertia increases

A. wrong: tangential acceleration is r × angular acceleration, so a smaller radius reduces it.

B. correct: tangential acceleration equals radius times angular acceleration, so it increases when the angular acceleration increases.

C. wrong: tangential acceleration depends on angular acceleration, not angular velocity.

moment of inertia does not enter the tangential acceleration.

Question 141 Pentavalent doping

When silicon is doped with a penta-valent element, it becomes:

- A. an insulator.
- B. a conductor.
- C. n-type semiconductor. ✓ **Correct answer**
- D. p-type semiconductor.

A. wrong: doping makes silicon a semiconductor, not an insulator.

B. wrong: doped silicon is a semiconductor, not a conductor.

C. correct: doping silicon with a pentavalent element adds free electrons, making an n-type semiconductor.

D. wrong: a p-type semiconductor needs a trivalent dopant.

Question 142 Cyclotron semi-circle time

In a cyclotron, the time taken by a particle of mass m and charge q to complete one semi-circle in a 'Dee' is t. If the magnetic field B is doubled, what will be the new time for completing a semi-circle?

- A. t / 4
- B. 2t
- C. t / 2 ✓ **Correct answer**
- D. t

A. wrong: doubling B halves the time, it does not quarter it.

B. wrong: doubling B reduces the time, it does not double it.

C. correct: the time for a semi-circle is $\pi m/qB$, so doubling B halves the time.

e time changes when B changes.

Question 143 Work lifting a box

A boy lifts a box of mass 2kg vertically from the ground to a height of 1.5m. The work done on the box is:

- A. 0 J
- B. 3 J
- C. 15 J
- D. 30 J ✓ **Correct answer**

A. wrong: work is done against gravity.

B. wrong: 3 J is mass times height, without g.

C. wrong: 15 J is mass times g, without the height.

D. correct: work = mgh = 2 × 10 × 1.5 = 30 J.

Question 144 Longitudinal wave example

_____ is an example of the longitudinal waves.

- A. sound waves ✓ **Correct answer**
- B. water waves
- C. light waves
- D. radio waves

A. correct: sound waves are longitudinal waves.

B. wrong: water waves are a combination of transverse and longitudinal motion.

C. wrong: light waves are transverse.

D. wrong: radio waves are transverse.

145 Projectile horizontal acceleration

The acceleration of a projectile along the x-axis (horizontal) is:

- A. Zero ✓ **Correct answer**
- B. Increasing
- C. Decreasing
- D. Constant

A. correct: there is no horizontal force on a projectile (neglecting air resistance), so its horizontal acceleration is zero.

B. wrong: the horizontal acceleration is zero.

C. wrong: the horizontal acceleration is zero.

D. wrong: the horizontal acceleration is zero, not a non-zero constant.

Question 146 Projectile x-velocity constant

X-component of velocity of projectile does not change due to:

- A. no force acting along X-axis ✓ **Correct answer**
- B. no acceleration produced along Y-axis
- C. no force along acting Y-axis
- D. acceleration produced along X-axis

A. correct: with no force along the X-axis there is no acceleration along it, so the X-component of velocity does not change.

B. wrong: there is acceleration along the Y-axis (gravity).

C. wrong: gravity acts along the Y-axis.

D. wrong: there is no acceleration along the X-axis.

147 Coil parallel to magnetic field

If a coil placed parallel to a uniform magnetic field is moved with uniform acceleration through the field, the induced emf through the coil is:

- A. Zero ✓ **Correct answer**
- B. constant
- C. increasing with time
- D. decreasing with time

A. correct: the coil is parallel to the field, so no magnetic flux links it and the flux does not change as it moves, so the induced emf is zero.

B. wrong: no flux links the coil, so no emf is induced.

C. wrong: no flux links the coil, so no emf is induced.

D. wrong: no flux links the coil, so no emf is induced.

Question 148 Standing wave maximum acceleration

In a standing wave, the point that undergoes maximum acceleration is:

- A. Node
- B. Antinode ✓ **Correct answer**
- C. Midpoint between node and antinode
- D. Every point along the wave

A. wrong: nodes do not move at all, so their acceleration is zero.

B. correct: antinodes have the largest amplitude, so they undergo the maximum acceleration.

C. wrong: the midpoint has less amplitude than the antinode.

D. wrong: the acceleration varies along the wave, being greatest at the antinodes.

149 Pendulum motion

A simple pendulum displaced by a student once and then it is left to oscillate on its own. The motion of pendulum can be described as:

- A. simple vibrations.
- B. simple harmonic motion. ✓ **Correct answer**
- C. forced oscillation.
- D. complex harmonic motion.

A. wrong: the motion is specifically simple harmonic motion.

B. correct: a pendulum displaced once and left to oscillate performs simple harmonic motion.

C. wrong: there is no external driving force.

D. wrong: the motion is simple harmonic, not complex.

Question 150 Turbulent oil flow

Oil in pipelines flow turbulently even with smooth walls, mainly due to:

- A. Oil temperature
- B. Flow velocity ✓ **Correct answer**
- C. Pipeline length
- D. Oil viscosity

A. wrong: temperature is not the main cause of turbulence here.

B. correct: oil flows turbulently mainly because of its high flow velocity (high Reynolds number).

C. wrong: the length is not the main cause of turbulence.

D. wrong: high viscosity opposes turbulence; velocity is the main cause.

151 Visible hydrogen series

Which series contains wavelengths in the visible portion of the hydrogen gas spectrum?

- A. Lymnan series
- B. Balmer series ✓ **Correct answer**
- C. Pfund series
- D. Paschen series

A. wrong: the Lyman series is in the ultraviolet.

B. correct: the Balmer series lies in the visible portion of the spectrum.

C. wrong: the Pfund series is in the infrared.

D. wrong: the Paschen series is in the infrared.

Question 152 Radiation not deflected

During a nuclear decay three types of radiations (α, β and γ) are emitted. Which one is not deflected by electric field?

- A. α
- B. β
- C. γ ✓ **Correct answer**
- D. both α and β

A. wrong: alpha particles are positively charged and are deflected.

B. wrong: beta particles are negatively charged and are deflected.

C. correct: gamma rays carry no charge, so they are not deflected by an electric field.

D. wrong: both alpha and beta particles are charged and are deflected.

153 Dielectric constant

The capacitance of parallel plates capacitor is 5 μ F. When a glass plate is placed between the plates of capacitor, its potential becomes1/8 of its original value. The value of dielectric constant will be:

- A. 1.6
- B. 5
- C. 8 ✓ **Correct answer**
- D. 40

A. wrong: the dielectric constant is 8, not 1.6.

B. wrong: 5 is the capacitance in microfarads, not the dielectric constant.

C. correct: the potential falls to 1/8, so the capacitance rises eightfold, giving a dielectric constant of 8.

D. wrong: the dielectric constant is 8, not 40.

Question 154 Displacement-time slope

The slope of displacement time graph represents:

- A. Displacement
- B. Velocity ✓ **Correct answer**
- C. Acceleration
- D. speed

A. wrong: the slope is the rate of change of displacement.

B. correct: the slope of a displacement-time graph is the velocity.

C. wrong: acceleration is the slope of a velocity-time graph.

D. wrong: the slope gives velocity (with direction), not just speed.

155 Force from x-component

The x-component of a force lying at 60° with x-axis is 100N. The magnitude of force is:

- A. 50 N
- B. 100 N
- C. 150 N
- D. 200 N ✓ **Correct answer**

A. wrong: the force is larger than its x-component.

B. wrong: 100 N is the x-component, not the force.

C. wrong: F = 100 / cos 60° = 200 N, not 150 N.

D. correct: Fx = F cos 60°, so F = 100 / 0.5 = 200 N.

Question 156 Continuity equation

The equation of continuity (Av = constant) is a mathematical statement of which of the following conservation law?

- A. Conservation of energy
- B. Conservation of momentum
- C. Conservation of mass ✓ **Correct answer**
- D. Conservation of volume

A. wrong: the continuity equation expresses conservation of mass.

B. wrong: the continuity equation expresses conservation of mass.

C. correct: Av = constant states that the mass flowing per second is conserved.

D. wrong: the continuity equation expresses conservation of mass (for an incompressible fluid the volume flow is constant, but the law is mass conservation).

157 Photon energy inverse

A photon’s energy is inversely proportional to its:

- A. Frequency
- B. Wavelength ✓ **Correct answer**
- C. Speed
- D. Amplitude

A. wrong: photon energy is directly proportional to frequency.

B. correct: photon energy $E = hc/\lambda$ is inversely proportional to wavelength.

C. wrong: all photons travel at the same speed.

D. wrong: photon energy does not depend on amplitude.

Question 158 Flow rate

If cross-sectional area of a point is $2cm^2$, where speed of liquid passing through is 100m/s, then flow rate will be:

- A. 200 m^3/s
- B. 2 m^3/s
- C. 50 m^3/s
- D. 0.02 m^3/s ✓ **Correct answer**

A. wrong: the area must be converted from cm^2 to m^2.

B. wrong: 2 cm^2 is 0.0002 m^2, giving 0.02 m^3/s.

C. wrong: the flow rate is 0.02 m^3/s, not 50.

D. correct: flow rate = area × speed = 2×10^{-4} $m^2 \times 100$ m/s = 0.02 m^3/s.

159 Vector cross product

Simplify the expression A × (A + B)

- A. A+A×B
- B. A^2+A×B
- C. A×B ✓ **Correct answer**
- D. 0

A. wrong: A × A is zero, not A.

B. wrong: A × A is zero, not A^2.

C. correct: A × (A + B) = A × A + A × B = 0 + A × B = A × B.

D. wrong: A × B is not generally zero.

Question 160 First overtone frequency

A guitar string of length 50 cm vibrates in its first overtone. The speed of waves in stretched string is 350 m/s. The frequency of this standing wave is:

- A. 175 Hz
- B. 350 Hz
- C. 525 Hz
- D. 700 Hz ✓ **Correct answer**

A. wrong: 175 Hz is the fundamental frequency, not the first overtone.

B. wrong: the first overtone is twice the fundamental.

C. wrong: the first overtone is 700 Hz, not 525 Hz.

D. correct: the fundamental is v/2L = 350 Hz, so the first overtone is 2 × 350 = 700 Hz.

161 Induced emf largest

A coil’s induced emf is largest when:

- A. Magnetic flux is maximum
- B. Rate of change of flux is maximum ✓ **Correct answer**
- C. Current is stead
- D. Resistance is minimum

A. wrong: the emf depends on the rate of change of flux, not on the flux itself.

B. correct: by Faraday's law, the induced emf is largest when the rate of change of magnetic flux is greatest.

C. wrong: a steady current induces no emf.

D. wrong: resistance affects the current, not the emf.

Question 162 Firecracker momentum

A fire cracker is exploded into its fragments and spread out with different velocities because of different masses. The momentum of each fragment is equal in magnitude to the one that is moving in opposite direction. Based on this scenario, which of the following statement is true?

- A. energy is conserved
- B. total momentum is conserved ✓ **Correct answer**
- C. KE is always conserved
- D. same force on all fragments

A. wrong: the explosion converts chemical energy, and kinetic energy is not conserved.

B. correct: with no external impulse, the total momentum of the fragments is conserved (equal and opposite in pairs).

C. wrong: kinetic energy is not conserved in an explosion.

e fragments experience different forces because their masses differ.

Question 163 Correct sentence structure

Which of the following sentences follows the correct structure?

- A. I suggested that you will see him.
- B. I suggested that you see him
- C. I suggest that you should see him. ✓ **Correct answer**
- D. I suggest you to see him.

A. wrong: after 'suggested', the subordinate clause should use 'should' or the base form, not 'will'.

B. wrong: the paper's taught structure after 'suggest' is 'should' + base verb; the bare subjunctive is not the form tested here.

C. correct: 'suggest that ... should' is the correct structure.

D. wrong: 'suggest' is not followed by an infinitive in this way.

Question 164 Equivocal meaning

The witness's testimony was so equivocal that the jury struggled to determine his true position. The most appropriate meaning of the word "equivocal" is:

- A. deliberately vague ✓ **Correct answer**
- B. unambigious
- C. highly emotional
- D. legally binding

A. correct: 'equivocal' means deliberately vague or ambiguous.

B. wrong: this is a misspelling of 'unambiguous', which is the opposite of equivocal.

C. wrong: 'equivocal' does not mean emotional.

quivocal does not mean legally binding.

Question 165 Preposition for duration

Choose the appropriate preposition. She has been working on this project _____ the past six months with remarkable consistency.

- A. since
- B. for ✓ **Correct answer**
- C. during
- D. by

A. wrong: 'since' is used with a point in time, not a duration.

B. correct: 'for' is used with a duration, 'for the past six months'.

C. wrong: 'during' needs a named period, not 'the past six months' in this construction.

D. wrong: 'by' does not fit a duration here.

Question 166 Grave synonym

Choose the most suitable synonym for the underlined word. The police have expressed grave concern about the missing child's safety.

- A. stout
- B. talkative
- C. courteous
- D. serious ✓ **Correct answer**

A. wrong: 'stout' means strongly built, not grave.

B. wrong: 'talkative' is not a synonym of 'grave'.

C. wrong: 'courteous' means polite, not grave.

D. correct: 'grave' means serious.

167 Opinion statement

Choose the example of opinion statement.

- A. If a number is divisible by 2, then it is even.
- B. The ground is wet, it probably rained. ✓ **Correct answer**
- C. The Eiffel Tower is in Paris.
- D. The human body has 206 bones.

A. wrong: this is a logical fact, not an opinion.

B. correct: this is an opinion (an inference), not a certain fact.

C. wrong: this is a fact.

D. wrong: this is a fact.

Question 168 Active voice

"The thief was caught by the police after along chase." Which of the following choices entails the correct change of voice?

- A. The police catch the thief after a long chase.
- B. The police caught the thief after a long chase. ✓ **Correct answer**
- C. The police catches the thief after a long chase.
- D. The police was catching the thief after a long chase.

A. wrong: the tense is wrong; the original is past tense.

B. correct: the active voice in the past tense is 'the police caught the thief'.

C. wrong: the tense and the subject-verb agreement are wrong.

D. wrong: this is the past continuous, not the simple past.

169 Dancing as participle

The poet saw dancing Daffodils. The underlined word is an example of:

- A. Present Participle ✓ **Correct answer**
- B. Gerund
- C. Past Participle
- D. Infinitive

A. correct: 'dancing' is a present participle used as an adjective describing the daffodils.

B. wrong: a gerund is a verb form used as a noun; 'dancing' here modifies a noun.

C. wrong: 'dancing' is not a past participle.

D. wrong: 'dancing' is not an infinitive.

Question 170 Formal sentence

Choose the most appropriate sentence, keeping in view the level of formality:

- A. The CEO told everyone they gotta stick to the safety rules no matter what.
- B. The CEO emphasized that the company should stick to safety rules always.
- C. The CEO told them they should keep the safety rules in mind, kinda always.
- D. The CEO emphasized that the company must adhere to the safety protocols at all times. ✓ **Correct answer**

A. wrong: 'gotta' is informal.

B. wrong: 'stick to' is informal.

C. wrong: 'kinda' is informal.

D. correct: this is the most formal version.

171 Rock the boat idiom

He didn’t mean to rock the boat with his comment during the meeting. What does "rock" most likely mean?

- A. A big piece of stone
- B. To move gently back and forth
- C. To cause trouble or disturbance ✓ **Correct answer**
- D. To mention broken boat

A. wrong: 'rock' here is not a stone.

B. wrong: that is the literal meaning, not the idiom.

C. correct: 'to rock the boat' means to cause trouble or disturb a settled situation.

D. wrong: the idiom has nothing to do with a broken boat.

Question 172 Odd one out squares

Find the odd one out from the given series: 4, 9, 16, 25, 36, 48...

- A. 25
- B. 48 ✓ **Correct answer**
- C. 9
- D. 16

A. wrong: 25 is a perfect square (5^2).

B. correct: 4, 9, 16, 25 and 36 are perfect squares, but 48 is not, so it is the odd one out.

C. wrong: 9 is a perfect square (3^2).

D. wrong: 16 is a perfect square (4^2).

173 Better academic performance

How can schools ensure better academic performance in the future?

- A. Regular academic support and counseling. ✓ **Correct answer**
- B. Heavy fine on absent students on daily basis.
- C. System of serious punishment for students.
- D. Frequent conduction of exam without calendar year.

A. correct: regular academic support and counselling is the constructive way to improve performance.

B. wrong: fining students does not improve learning.

C. wrong: punishment does not improve academic performance.

D. wrong: frequent unplanned exams do not improve performance.

Question 174 Sequence fourth term

A sequence is obtained by multiplying the previous term of the sequence by 2 and subtracting 1 from it. If the first term of the sequence is 2, what is its fourth term?

- A. 9 ✓ **Correct answer**
- B. 11
- C. 13
- D. 7

A. correct: the terms are 2, 3, 5, 9 (each is twice the previous minus 1), so the fourth term is 9.

B. wrong: the fourth term is 9, not 11.

C. wrong: the fourth term is 9, not 13.

D. wrong: the fourth term is 9, not 7.

175 Patient files per day

A medical student reviews 18 patients files per hour. She reviews for 5 hours daily. How many patient files does she review per day?

- A. 80
- B. 85
- C. 90 ✓ **Correct answer**
- D. 95

A. wrong: 18 × 5 = 90, not 80.

B. wrong: 18 × 5 = 90, not 85.

C. correct: 18 files per hour for 5 hours is 90 files per day.

D. wrong: 18 × 5 = 90, not 95.

Question 176 Probability blue pen

A box contains 4 blue pens, 3 black pens, and 3 red pens. If one pen is selected at random, what is the probability that it is blue?

- A. 1/3
- B. 2/5 ✓ **Correct answer**
- C. 2/3
- D. 2/10

A. wrong: there are 4 blue pens out of 10, not 1 in 3.

B. correct: 4 blue pens out of 10 total gives a probability of 4/10 = 2/5.

C. wrong: the probability is 2/5, not 2/3.

D. wrong: the probability is 4/10 = 2/5, not 2/10.

177 Syllogism validity

All viruses are living things. Some disease causing agents are viruses. Therefore, some disease causing agents are living things. The conclusion given above is _____.

- A. Valid ✓ **Correct answer**
- B. Invalid
- C. Emotional
- D. Contradictory

A. correct: the conclusion follows logically from the premises (all viruses are living; some disease-causing agents are viruses; so some disease-causing agents are living).

B. wrong: the reasoning is valid, even though the first premise is factually wrong.

C. wrong: validity is a matter of logic, not emotion.

D. wrong: the conclusion does not contradict the premises.

Question 178 Most coins

Five friends Parvez, Qasim, Rashid, Sami and Tahir each have different number of coins. The difference in number of coins is given in the following statements. 1. Parvez has more coins than Qasim 2. Rashid has fewer coins than Sami 3. Tahir has more coins than Parvez 4. Qasim has more coins than Rashid 5. Sami has fewer coins than Qasim Based on the given information, which friend has most coins?

- A. Sami
- B. Parvez
- C. Qasim
- D. Tahir ✓ **Correct answer**

A. wrong: Sami has fewer coins than Qasim.

B. wrong: Tahir has more coins than Parvez.

rvez has more coins than Qasim.

D. correct: Tahir has more than Parvez, who has more than Qasim, who has more than Sami and Rashid, so Tahir has the most.

Question 179 Flu outbreak actions

Statement: A sudden outbreak of flu occurs in a school. Course of Action: I. Isolate affected students. II. Increase sanitation measures.

- A. Only I follows
- B. Only II follows
- C. Both I and II follows ✓ **Correct answer**
- D. Neither follows

A. wrong: increasing sanitation also follows.

B. wrong: isolating affected students also follows.

C. correct: both isolating affected students and increasing sanitation are proper courses of action.

D. wrong: both actions follow.

Question 180 Area of square

What is the area of square which is 8 feet long and 8 feet wide?

- A. 40
- B. 55
- C. 64 ✓ **Correct answer**
- D. 70

A. wrong: 8 × 8 = 64, not 40.

B. wrong: 8 × 8 = 64, not 55.

e area is 8 × 8 = 64 square feet.

D. wrong: 8 × 8 = 64, not 70.

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