

SHAHEED ZULFIQAR ALI BHUTTO MEDICAL UNIVERSITY, ISLAMABAD

SZABMU MDCAT

Paper 2026

Paper Code 2 · Fully Solved with Answer Key & Explanations

180

MCQs

180

Minutes

5

Subjects

20 Sep

Held on

Paper at a glance

Subject	Questions	MCQ No.
Biology	81	1-81
Chemistry	45	82-126
Physics	36	127-162
English	9	163-171
Logical Reasoning	9	172-180
Total	180	1-180

How to use this solved paper

1. Attempt each MCQ first, then check the answer box below it.
2. Each question carries 1 mark; there is no negative marking.
3. Read the explanation even for questions you got right.
4. Record your score in the subject-wise tracker at the end.

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BIOLOGY

Q1-Q81 · 81 MCQs

Q1. The axon of motor neuron forms synapses with _____?

- (A) Axon of sensory neuron (B) Dendron of sensory neuron
(C) Receptors (D) Muscle cells/effector

✓ Answer: (D) Muscle cells/effector**Explanation:** The axon of a motor neuron ends on an effector (muscle fibre or gland) at a neuromuscular junction, carrying the command from the CNS to the effector.**Q2. Which part of the brain stores human memory?**

- (A) Cerebrum (B) Medulla oblongata
(C) Hypothalamus (D) Corpus callosum

✓ Answer: (A) Cerebrum**Explanation:** Memory, learning, reasoning and intelligence are functions of the cerebrum (cerebral cortex); the hippocampus inside it is key for forming memories.**Q3. If there is an injury in the hypothalamus region of the brain, it is most likely to affect:**

- (A) Coordination during locomotion (B) Short-term memory
(C) Regulation of body temperature (D) Decision making

✓ Answer: (C) Regulation of body temperature**Explanation:** The hypothalamus is the body's thermostat: it controls body temperature, hunger, thirst and water balance. Coordination is cerebellar; memory and decisions are cerebral.**Q4. Which one of the following is involved in blinking of an eye?**

- (A) Spinal reflex (B) Cranial reflex
(C) Membrane reflex (D) Nuclear reflex

✓ Answer: (B) Cranial reflex**Explanation:** Blinking is a cranial reflex — the reflex arc passes through the brain (cranial nerves), not the spinal cord.**Q5. Brain stem include all of the following, Except.**

- (A) Cerebrum (B) Pons
(C) Midbrain (D) Medulla Oblongata

✓ Answer: (A) Cerebrum**Explanation:** The brain stem is made of the midbrain, pons and medulla oblongata. The cerebrum is part of the forebrain, not the brain stem.**Q6. All enzymes are _____ proteins?**

- (A) Globular & insoluble in water (B) Globular & soluble in water
(C) Fibrous & insoluble in water (D) Fibrous & soluble in water

✓ Answer: (B) Globular & soluble in water**Explanation:** Enzymes are globular proteins; their folded shape keeps hydrophilic groups outside, so they are soluble in water.

Q7. A marked increase in temperature reduces rate of the enzyme catalyzed reaction by _____.

- (A) Decreasing the kinetic energy of substrate
- (B) Changing the pH of reaction media
- (C) Destroying the tertiary structure of enzyme
- (D) Decreasing the activation energy

✓ **Answer: (C) Destroying the tertiary structure of enzyme**

Explanation: High temperature breaks the weak bonds holding the tertiary structure, so the enzyme denatures and the active site loses its shape.

Q8. Which model best explains the specificity of enzymes for their substrate?

- (A) Induced fit model
- (B) Lock and Key model
- (C) Fluid mosaic model
- (D) Sliding filament model

✓ **Answer: (B) Lock and Key model**

Explanation: In the Lock and Key model the active site has a rigid shape that fits only one specific substrate, explaining enzyme specificity. Induced fit explains flexibility.

Q9. Which of the following truly describe the Activation Energy of an Enzyme?

- (A) Total energy of the reaction system
- (B) Minimum energy required to start a chemical reaction
- (C) Energy lost during the chemical reaction
- (D) Energy difference between the chemical potential energy of the reactants and the products

✓ **Answer: (B) Minimum energy required to start a chemical reaction**

Explanation: Activation energy is the minimum energy needed to start a chemical reaction. Enzymes speed up reactions by lowering it.

Q10. How does an enzyme increase the rate of a reaction?

- (A) By bringing the reaction molecules into precise orientation
- (B) By increasing the rate of random collisions of molecules
- (C) By shifting the point of equilibrium of the reaction
- (D) By supplying the energy required to start the reaction

✓ **Answer: (A) By bringing the reaction molecules into precise orientation**

Explanation: Enzymes hold substrate molecules in the active site in the precise orientation needed to react, lowering activation energy. They do not shift equilibrium or supply energy.

Q11. Naturally, enzymes increase reaction rate without:

- (A) Converting substrate into products
- (B) Being consumed in reaction
- (C) Lowering its activation energy
- (D) Forming enzyme-substrate complex

✓ **Answer: (B) Being consumed in reaction**

Explanation: An enzyme is a catalyst: it speeds up the reaction but is not consumed and can be reused again and again.

Q12. Darwin believed in perceived unity of life with _____ related though decent from _____.

- (A) all organisms: common ancestors (B) few organisms: different ancestors
(C) few organisms: common ancestors (D) all organisms: different ancestors

✓ **Answer: (A) all organisms: common ancestors**

Explanation: Darwin saw the unity of life as all organisms being related through descent from common ancestors.

Q13. In Darwin's theory of natural selection "struggle for existence" is:

- (A) Fight for territory (B) Competition for survival
(C) Fight for evolution (D) to admit the rights of others

✓ **Answer: (B) Competition for survival**

Explanation: Organisms produce more offspring than resources can support, so they compete for food, space and mates — the struggle for existence is competition for survival.

Q14. History of life is like a tree. This concept of Darwinism is called:

- (A) Natural selection (B) Descent with modification
(C) Struggle for existence (D) over production

✓ **Answer: (B) Descent with modification**

Explanation: Darwin pictured the history of life as a branching tree: all species descended from ancestors with modifications — 'descent with modification'.

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Q15. A researcher claims that environment directly induces useful traits in organisms, that are inherited in next generations. This idea aligns with:

- (A) Lamarckism (B) Darwinism
(C) Special creationism (D) Neo-Darwinism

✓ **Answer: (A) Lamarckism**

Explanation: Lamarck proposed that the environment induces useful traits during an organism's life and that these acquired characters are inherited.

Q16. The first menstrual flow is:

- (A) Menopause (B) Menstruation
(C) Menarche (D) Ovulation

✓ **Answer: (C) Menarche**

Explanation: Menarche is the first menstrual flow at puberty. Menopause is its permanent end.

Q17. The ceasation (end) of mensuration in female is called

- (A) Menarche (B) Mensural cycle
(C) Menopause (D) Maturation

✓ **Answer: (C) Menopause**

Explanation: Menopause is the permanent stop of menstrual cycles, usually around 45–55 years of age.

Q18. A sudden rise in estrogen levels in females, may leads to which event?

- (A) Menstruation
- (B) LH surge
- (C) Implantation
- (D) Progesterone drop

✓ **Answer: (B) LH surge**

Explanation: The rising oestrogen from the maturing follicle triggers positive feedback on the pituitary, causing the mid-cycle LH surge that leads to ovulation.

Q19. Which hormone is involved in the menstrual cycle and its secretion is increased right after day 14 and starts decreasing again at the end of the cycle, and if fertilization takes place then its concentration is further increased by the placenta?

- (A) FSH
- (B) LH
- (C) Progesterone
- (D) Both LH and FSH

✓ **Answer: (C) Progesterone**

Explanation: After ovulation (day 14) the corpus luteum secretes progesterone; it falls at the end of the cycle, but in pregnancy the placenta keeps producing it.

Q20. Nerve impulse carried directly to sarcoplasmic reticulum through?

- (A) Sarcolemma
- (B) Sarcoplasm
- (C) Nerve fibre
- (D) T-tubule

✓ **Answer: (D) T-tubule**

Explanation: T-tubules are inward folds of the sarcolemma that carry the impulse deep into the fibre, right next to the sarcoplasmic reticulum, causing Ca^{2+} release.

Q21. During muscle contraction, after calcium binds to troponin, the binding sites on which protein become exposed?

- (A) Actin
- (B) Myosin
- (C) Myoglobin
- (D) Tropomyosin

✓ **Answer: (A) Actin**

Explanation: Ca^{2+} binding to troponin shifts tropomyosin away from the myosin-binding sites on actin, so cross-bridges can form.

Q22. Osteoarthritis indicates inflammation in the joints of _____.

- (A) Toes
- (B) Neck
- (C) Knee
- (D) Wrist

✓ **Answer: (C) Knee**

Explanation: Osteoarthritis is degeneration and inflammation of weight-bearing joints; the knee is the most commonly affected joint.

Q23. Which of the following changes occur when skeletal muscles contract?

- (A) The A- bands shorten
- (B) The I- Bands shorten
- (C) The Z- lines move further apart
- (D) The H- zone becomes more visible

✓ **Answer: (B) The I- Bands shorten**

Explanation: In the sliding filament model the I-band and H-zone shorten and Z-lines move closer; the A-band length stays the same.

Q24. Which one of the following statements is correct for troponin?

- (A) It is an ATPase
- (B) It binds to actin only
- (C) It consists of three polypeptide chains
- (D) It has greater affinity with Calcium ions than myosin

✓ **Answer: (C) It consists of three polypeptide chains**

Explanation: Troponin is a complex of three polypeptides — troponin T, I and C (TnC binds calcium). It is not an ATPase; myosin is.

Q25. _____ are the bone dissolving cells.

- (A) Osteoclasts
- (B) Osteocytes
- (C) Osteoblasts
- (D) All of these are correct

✓ **Answer: (A) Osteoclasts**

Explanation: Osteoclasts dissolve (resorb) bone matrix. Osteoblasts form bone; osteocytes are mature bone cells.

Q26. Which of the following is NOT a feature of cartilaginous joints?

- (A) Slight mobility
- (B) Absence of synovial fluid
- (C) Presence of cartilage
- (D) Presence of joint cavity

✓ **Answer: (D) Presence of joint cavity**

Explanation: Cartilaginous joints (e.g. between vertebrae) are slightly movable and have no joint cavity or synovial fluid. A joint cavity is a feature of synovial joints.

Q27. When male parent (RR) has a cross with female parent (rr), then according to Law of segregation all F1 offspring appears with a genotype:

- (A) RR
- (B) Rr
- (C) rr
- (D) Rrr

✓ **Answer: (B) Rr**

Explanation: RR gives only R gametes and rr gives only r gametes, so every F1 offspring is Rr (heterozygous).

Q28. Which of the following genetic disorder causes bleeding disease?

- (A) Sickle Cell anemia
- (B) Hemophilia
- (C) Thalassemia
- (D) Cystic fibrosis

✓ **Answer: (B) Hemophilia**

Explanation: Haemophilia is an X-linked recessive disorder in which a clotting factor is missing, so blood fails to clot and bleeding continues.

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Q29. Y- linked traits are always passed from father to the:

- (A) Sons only
- (B) Daughters only
- (C) 50% sons and 50% Daughters
- (D) 75% sons and 25% daughter

✓ **Answer: (A) Sons only**

Explanation: The Y chromosome is present only in males, so Y-linked (holandric) traits pass from father to all his sons only.

Q30. How many different genotypes are required for producing a pea plant with round and yellow seeds phenotype?

- (A) 1
- (B) 2
- (C) 4
- (D) 8

✓ **Answer: (C) 4**

Explanation: Round yellow phenotype can come from four genotypes: RRYy, RRYy, RrYY and RrYy.

Q31. In which of the following phases of cell cycle, gene crossing over occurs?

- (A) Telophase
- (B) Prophase I
- (C) Metaphase I
- (D) Prophase II

✓ **Answer: (B) Prophase I**

Explanation: Crossing over occurs between non-sister chromatids of homologous chromosomes during the pachytene stage of prophase I of meiosis.

Q32. Which of the following best describes the production of different combinations of alleles in daughter cells, as a result of the random alignment of bivalents on the equator of the spindle during metaphase I of meiosis?

- (A) Segregation
- (B) Sex Linkage
- (C) Crossing Over
- (D) Independent Assortment

✓ **Answer: (D) Independent Assortment**

Explanation: Random orientation of bivalents at metaphase I produces new combinations of alleles in daughter cells — independent assortment.

Q33. A genetic disease is transferred from a phenotypically normal but carrier female to only some of male progeny. The disease is:

- (A) Autosomal dominant
- (B) Autosomal recessive
- (C) Sex-linked dominant
- (D) Sex-linked recessive

✓ **Answer: (D) Sex-linked recessive**

Explanation: A normal carrier mother passing the disease to some (about half) of her sons is the classic pattern of sex-linked (X-linked) recessive inheritance.

Q34. Which chamber of the heart pumps blood to the lungs?

- (A) Right Atrium
- (B) Right Ventricle
- (C) Left Atrium
- (D) Left Ventricle

✓ **Answer: (B) Right Ventricle**

Explanation: The right ventricle pumps deoxygenated blood into the pulmonary trunk toward the lungs.

Q35. Which one of the following statements is incorrect about circulatory system?

- (A) All arteries carry blood away from the heart.
- (B) All veins carry blood towards the heart.
- (C) All arteries carry oxygenated blood.
- (D) All veins carry blood at low pressure.

✓ **Answer: (C) All arteries carry oxygenated blood.**

Explanation: Not all arteries carry oxygenated blood — the pulmonary artery carries deoxygenated blood to the lungs. Arteries are defined by direction (away from heart).

Q36. Which of the following valves control the entry of blood into the ventricles of a heart?

- (A) Artioventricular valves
- (B) Semilunar valves
- (C) Pulmonary valves
- (D) Aortic valves

✓ **Answer: (A) Artioventricular valves**

Explanation: The atrioventricular valves (tricuspid and bicuspid) control the flow of blood from atria into the ventricles.

Q37. The valve of heart through which only oxygenated blood move is _____.

- (A) Tricuspid
- (B) Bicuspid
- (C) Pulmonary semilunar
- (D) Bicuspid and Tricuspid

✓ **Answer: (B) Bicuspid**

Explanation: The bicuspid (mitral) valve lies on the left side of the heart, where only oxygenated blood flows from left atrium to left ventricle.

Q38. Bicuspid valve guards the opening between __ in a heart.

- (A) Stomach and Intestine
- (B) Pulmonary Vein and Left Atrium
- (C) Right Atrium and Right Ventricle
- (D) Left Atrium and Left Ventricle

✓ **Answer: (D) Left Atrium and Left Ventricle**

Explanation: The bicuspid (mitral) valve guards the opening between the left atrium and the left ventricle.

Q39. What are antigens, in the context of immune recognition?

- (A) Hormone released during infection
- (B) Self-identifying lipids in plasma
- (C) Cell surface proteins and Oligosaccharides
- (D) Enzymes released by B-cells

✓ **Answer: (C) Cell surface proteins and Oligosaccharides**

Explanation: Antigens are mostly surface proteins and oligosaccharides (glycoproteins) that the immune system recognises as foreign or self.

Q40. Antigens bind with:

- (A) C-Region of antibody
- (B) V- Region of antigens
- (C) C- Region of antigens
- (D) V- Region of antibody

✓ **Answer: (D) V- Region of antibody**

Explanation: Antigens bind to the variable (V) region at the tips of the antibody arms — this region differs for each antibody.

Q41. Constant region of a specific type of antibody is made up of type of amino acids.

- (A) Same (B) Different
(C) Variable (D) Hydrophobic

✓ **Answer: (A) Same**

Explanation: The constant region has the same amino acid sequence in all antibodies of a given class, unlike the variable region.

Q42. Primary immune response is characterized by:

- (A) Rapid antibody production (B) Slow and low antibody production
(C) No antibody formation (D) Immediate and strong immunity

✓ **Answer: (B) Slow and low antibody production**

Explanation: On first exposure, antibody production is slow to start and low in amount — the primary immune response. The secondary response is fast and strong.

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Q43. Breathing is also named as?

- (A) Internal respiration (B) Cellular respiration
(C) Inspiration (D) Ventilation

✓ **Answer: (D) Ventilation**

Explanation: Breathing — moving air into and out of the lungs — is called ventilation.

Q44. Warming up of the air in nasal cavity occurs with the help of blood capillaries, located _____:

- (A) Underneath mucous membrane (B) Surrounding the cilia
(C) Surrounding cartilages (D) In the nasopharynx

✓ **Answer: (A) Underneath mucous membrane**

Explanation: A rich network of blood capillaries lies underneath the mucous membrane of the nasal cavity; it warms the incoming air.

Q45. Intercostal muscles are _____?

- (A) Skeletal muscles (B) Involuntary smooth muscles
(C) Voluntary smooth muscles (D) Cardiac muscles

✓ **Answer: (A) Skeletal muscles**

Explanation: Intercostal muscles are skeletal (striated, voluntary) muscles attached to the ribs.

Q46. Expansion and contraction of the lungs is accomplished by

- (A) Smooth muscles in bronchioles (B) Smooth muscles in alveoli
(C) Intercostal muscles (D) Diaphragm & intercostal muscles

✓ **Answer: (D) Diaphragm & intercostal muscles**

Explanation: Lung volume changes are produced by contraction and relaxation of the diaphragm and the intercostal muscles; the lungs have no muscles of their own for this.

Q47. During gaseous exchange in human, how many times, cells membranes of different cells are crossed by oxygen molecule from alveolar air to reach in the RBC in alveolar capillaries

- (A) 2 (B) 3
(C) 4 (D) 5

✓ **Answer: (D) 5**

Explanation: O₂ crosses alveolar epithelial cell (in and out = 2), capillary endothelial cell (in and out = 2), then the RBC membrane (1) = 5 membranes.

Q48. The pepsin is converted into active form by the action of:

- (A) Trypsin (B) Chymotrypsin
(C) Acidic medium (D) Alkaline medium

✓ **Answer: (C) Acidic medium**

Explanation: Pepsin is secreted as inactive pepsinogen; the acidic medium (HCl) of the stomach converts it into active pepsin.

Q49. The back flush of acidic chyme from stomach to esophagus lead to burning sensation in the chest known as

- (A) Pyrosis (B) Cirrhosis
(C) Segmentation (D) Peristalsis

✓ **Answer: (A) Pyrosis**

Explanation: Heartburn (pyrosis) is a burning feeling in the chest caused by reflux of acidic chyme into the oesophagus.

Q50. Which component of bile produced by liver may cause gall stones?

- (A) Iron (B) Bilirubin
(C) Cholesterol (D) Lipase

✓ **Answer: (C) Cholesterol**

Explanation: Gallstones mostly form when excess cholesterol in bile crystallises in the gall bladder.

Q51. Chymotrypsin present in pancreatic juice is responsible for _____.

- (A) Digestion of lipids to glycerol and fatty acids
(B) Digestion of DNA and RNA into nucleotides
(C) Digestion of proteins into smaller peptides
(D) Digestion of polysaccharides into maltose or glucose

✓ **Answer: (C) Digestion of proteins into smaller peptides**

Explanation: Chymotrypsin (with trypsin) is a protease in pancreatic juice that breaks proteins into smaller peptides.

Q52. How does pancreatic amylase digests carbohydrates?

- (A) Digests polysaccharides into maltose (B) Digests polysaccharides into sucrose
(C) Digests polysaccharides into lactose (D) Digests polysaccharides into galactose

✓ **Answer: (A) Digests polysaccharides into maltose**

Explanation: Pancreatic amylase hydrolyses starch (a polysaccharide) into the disaccharide maltose.

Q53. Which of the following event would likely to produce hunger pangs in your stomach, when you are fasting:

- (A) Low sodium level in blood (B) Antiperistalsis of alimentary canal
(C) Low blood glucose (D) Dehydration in body

✓ **Answer: (C) Low blood glucose**

Explanation: Low blood glucose during fasting signals the brain, producing strong stomach contractions felt as hunger pangs.

Q54. Which process directly depends on hydrostatic pressure in the kidney functioning?

- (A) Pressure Filtration (B) Selective Reabsorption
(C) Tubular Secretion (D) Osmoregulation

✓ **Answer: (A) Pressure Filtration**

Explanation: Pressure (ultra)filtration in the glomerulus is driven by the high hydrostatic blood pressure in the glomerular capillaries.

Q55. Hypercalcemia & Hypercalciuria are responsible for kidney stones and are due to condition:

- (A) Hypothyroidism (B) Hyperthyroidism
(C) Hypoparathyroidism (D) Hyperparathyroidism

✓ **Answer: (D) Hyperparathyroidism**

Explanation: Excess parathormone (hyperparathyroidism) raises blood calcium (hypercalcaemia) and urinary calcium (hypercalciuria), favouring kidney stones.

Q56. In situation of dehydration, human kidneys respond by:

- (A) Decreasing blood pressure (B) Decreasing ADH secretion
(C) Increasing water reabsorption (D) Increasing urine output

✓ **Answer: (C) Increasing water reabsorption**

Explanation: In dehydration more ADH is released, collecting ducts reabsorb more water, and a small volume of concentrated urine is produced.

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Q57. Which of the following is not the function of kidney?

- (A) Ion regulation (B) Water regulation
(C) Temperature regulation (D) Waste removal

✓ **Answer: (C) Temperature regulation**

Explanation: Kidneys regulate ions, water and remove wastes. Temperature regulation is by skin and hypothalamus, not the kidney.

Q58. An increased aldosterone secretion results in _____.

- (A) Loss of Na ions (B) Retention of Na ions
(C) Increased glucose (D) Reduced urine

✓ **Answer: (B) Retention of Na ions**

Explanation: Aldosterone makes the distal tubule reabsorb (retain) Na⁺ ions (and excrete K⁺).

Q59. When monoclonal antibodies are combined with fluorescent labels, this technique is known as:

- (A) Fluorescence microscopy
- (B) Fluorescence crystallography
- (C) Fluorescence therapy
- (D) Fluorescence biography

✓ **Answer: (A) Fluorescence microscopy**

Explanation: Monoclonal antibodies tagged with fluorescent dyes are used to locate specific molecules under fluorescence microscopy.

Q60. The enzyme which joins two pieces of DNA is:

- (A) DNA Polymerase I
- (B) DNA Polymerase III
- (C) DNA Ligase
- (D) Restriction Endonuclease

✓ **Answer: (C) DNA Ligase**

Explanation: DNA ligase joins two DNA fragments by forming phosphodiester bonds — the 'molecular glue' of recombinant DNA technology.

Q61. DNA probes are best described as:

- (A) Enzymes that cut DNA
- (B) Short, single-stranded DNA sequences complementary to target DNA
- (C) Double-stranded RNA molecules
- (D) Antibodies that bind proteins

✓ **Answer: (B) Short, single-stranded DNA sequences complementary to target DNA**

Explanation: A DNA probe is a short, single-stranded, labelled DNA sequence that pairs with its complementary target DNA.

Q62. The shape of a bacteriophage is:

- (A) Spherical
- (B) Helical
- (C) Tadpole like
- (D) Comma like

✓ **Answer: (C) Tadpole like**

Explanation: A bacteriophage (e.g. T4) has a polyhedral head and a tail — a tadpole-like shape.

Q63. In the host Helper-T lymphocytes, the viral RNA is converted into cDNA by ____.

- (A) Transcriptase
- (B) RNA polymerase
- (C) DNA polymerase
- (D) Reverse transcriptase

✓ **Answer: (D) Reverse transcriptase**

Explanation: HIV carries the enzyme reverse transcriptase, which copies its RNA into complementary DNA (cDNA) inside helper T-cells.

Q64. The virus responsible for AIDS is classified as:

- (A) DNA virus
- (B) Retrovirus
- (C) Viroid
- (D) Bacteriophage

✓ **Answer: (B) Retrovirus**

Explanation: HIV is an RNA virus that uses reverse transcriptase — a retrovirus.

Q65. Which of the following best defines the removal of electrons from a substance by the addition of oxygen or removal of hydrogen.

- (A) Oxidation
- (B) Reduction
- (C) Phosphorylation
- (D) Dephosphorylation

✓ **Answer: (A) Oxidation**

Explanation: Oxidation is loss of electrons, addition of oxygen or removal of hydrogen. Reduction is the opposite.

Q66. Which of the following is a major benefit of anaerobic respiration during exercise in humans?

- (A) Glucose molecules are fully oxidised during anaerobic respiration.
- (B) Anaerobic respiration can supply ATP very rapidly for a short period of time.
- (C) It produces useful byproducts.
- (D) Anaerobic respiration can supply ATP indefinitely.

✓ **Answer: (B) Anaerobic respiration can supply ATP very rapidly for a short period of time.**

Explanation: Anaerobic respiration (glycolysis to lactate) can supply ATP very rapidly for short bursts of intense exercise, though it cannot last long.

Q67. Oxidation, decarboxylation and addition of coenzyme A to pyruvate results into the production of

- (A) Acetyl Co-A
- (B) Phosphoenolpyruvate
- (C) Glucose 6-phosphate
- (D) Citrate

✓ **Answer: (A) Acetyl Co-A**

Explanation: In the link reaction pyruvate is oxidised, decarboxylated (loses CO₂) and joined to coenzyme A, forming acetyl CoA.

Q68. The disaccharide formed during digestion of starch is:

- (A) Sucrose
- (B) Cellobiose
- (C) Lactose
- (D) Maltose

✓ **Answer: (D) Maltose**

Explanation: Amylase breaks starch into maltose (glucose + glucose).

Q69. Which of the following is correct about a nucleotide?

- (A) It may consist of one to five nitrogenous bases
- (B) It may consist of one or two pentose sugar units
- (C) It may consist of one to three phosphate groups
- (D) It may consist of a pentose or hexose sugar

✓ **Answer: (C) It may consist of one to three phosphate groups**

Explanation: A nucleotide has one nitrogenous base and one pentose sugar, but can carry one to three phosphate groups (e.g. AMP, ADP, ATP).

Q70. Which of the two nucleotides have 2 ringed structures?

- (A) Adenine and Guanine
- (B) Cytosine and Thymine
- (C) Adenine and Thymine
- (D) Cytosine and Guanine

✓ **Answer: (A) Adenine and Guanine**

Explanation: Adenine and guanine are purines, with a double-ring structure. Cytosine, thymine and uracil are single-ring pyrimidines.

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Q71. Water maintains the shape and structure of large biological molecules mainly through:

- (A) Covalent bonding
- (B) Hydrogen bonding and hydrophobic interactions
- (C) Ionic interactions
- (D) Disulfide bridges

✓ **Answer: (B) Hydrogen bonding and hydrophobic interactions**

Explanation: Hydrogen bonds with water and hydrophobic interactions (non-polar groups hiding from water) maintain the folded shape of macromolecules.

Q72. The common feature(s) of prokaryotic and eukaryotic cells is/are _____.

- (A) Presence of plasma membrane only
- (B) Presence of ribosomes only
- (C) Presence of genetic material only
- (D) Presence of plasma membrane, ribosomes & genetic material

✓ **Answer: (D) Presence of plasma membrane, ribosomes & genetic material**

Explanation: Both prokaryotic and eukaryotic cells have a plasma membrane, ribosomes and genetic material (DNA).

Q73. Which of the following is biopolymer?

- (A) Water
- (B) Phospholipids
- (C) Histone
- (D) Waxes

✓ **Answer: (C) Histone**

Explanation: Histone is a protein — a polymer of amino acids — so it is a biopolymer. Water, waxes and phospholipids are not polymers.

Q74. Information regarding living organism's body processes from construction of body structure to flow of information from nucleus are provided by:

- (A) Biogenic elements
- (B) Biological molecules
- (C) Inorganic molecules
- (D) Organic molecules

✓ **Answer: (B) Biological molecules**

Explanation: Biological molecules (proteins, nucleic acids, etc.) provide information for building body structures and flow of information from the nucleus.

Q75. Peptide bond is formed between.

- (A) C-terminal and C-terminal
- (B) N-terminal and C-terminal
- (C) N-terminal and N-terminal
- (D) C-terminal and OH-terminal

✓ **Answer: (B) N-terminal and C-terminal**

Explanation: A peptide bond forms between the carboxyl (C-terminal) group of one amino acid and the amino (N-terminal) group of the next.

Q76. In which of the following organelles, the process of Transcription takes place?

- (A) Ribosomes (B) Golgi complex
(C) Lysosomes (D) Nucleus

✓ **Answer: (D) Nucleus**

Explanation: Transcription (DNA to mRNA) takes place in the nucleus of eukaryotes; translation happens on ribosomes.

Q77. The approximate diameter of chromatin at the level of supercoiling is

- (A) 250nm (B) 300nm
(C) 350nm (D) 400nm

✓ **Answer: (B) 300nm**

Explanation: The 30 nm chromatin fibre loops and supercoils into a fibre of about 300 nm diameter.

Q78. Which of the following organelles predominantly produces Adenosine Triphosphate (ATP) in the cell?

- (A) Nucleus (B) Ribosome
(C) Mitochondria (D) Endosome

✓ **Answer: (C) Mitochondria**

Explanation: Mitochondria produce most of the cell's ATP through aerobic respiration — the 'powerhouse of the cell'.

Q79. In mitochondria, small knob like structures called F-1 particles are found in

- (A) Outer membrane (B) inner membrane
(C) Outer component (D) inner component

✓ **Answer: (B) inner membrane**

Explanation: F1 particles (ATP synthase heads) project from the inner mitochondrial membrane (cristae).

Q80. Which organelle is in abundance in secretory cells?

- (A) Mitochondria (B) Golgi complex
(C) Nuclei (D) Nucleoli

✓ **Answer: (B) Golgi complex**

Explanation: Secretory cells have abundant Golgi complexes to package and secrete products such as enzymes and hormones.

Q81. Olfactory bulb is present in:

- (A) Nose (B) Nasal Cavity
(C) Throat (D) Brain

✓ **Answer: (D) Brain**

Explanation: The olfactory bulb is a part of the forebrain that receives smell signals from the nose.

CHEMISTRY

Q82-Q126 · 45 MCQs

Q82. If the temperature of a gas is doubled at constant pressure, what will be its volume:

- (A) Halved (B) Doubled
(C) Remains constant (D) Quadrupled

✓ **Answer: (B) Doubled**

Explanation: Charles's law: at constant pressure $V \propto T$ (in kelvin), so doubling the absolute temperature doubles the volume.

Q83. Which pair of compounds form hydrogen bond?

- (A) Water and acetaldehyde (B) Formic acid and acetic acid
(C) Ethyl acetate and acetic acid (D) Acetone and water

✓ **Answer: (B) Formic acid and acetic acid**

Explanation: Formic acid and acetic acid both have $-\text{COOH}$ groups that act as H-bond donors and acceptors, forming hydrogen bonds with each other.

Q84. In body centered crystal system the central ion is attach with,

- (A) 1 unit cell (B) 4 unit cell
(C) 6 unit cell (D) 10 unit cell

✓ **Answer: (A) 1 unit cell**

Explanation: The ion at the body centre lies completely inside the cube, so it belongs to only one unit cell.

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Q85. For an endothermic reversible reaction, the yield will increase if

- (A) Temperature increased (B) Temperature decreased
(C) Catalyst added (D) Reactants removed

✓ **Answer: (A) Temperature increased**

Explanation: By Le Chatelier's principle, raising temperature favours the endothermic direction, so the forward yield increases.

Q86. Methanol is manufactured by reacting carbon dioxide and hydrogen. $\text{CO}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons \text{CH}_3\text{OH}(\text{g}) + \text{H}_2\text{O}(\text{g})$ $\Delta H = -49 \text{ KJ/mol}$ What would increase the equilibrium yield of methanol in this process.

- (A) Adding methanol (B) Adding an excess of steam.
(C) Decreasing the pressure. (D) Decreasing the temperature.

✓ **Answer: (D) Decreasing the temperature.**

Explanation: The reaction is exothermic (ΔH negative), so lowering temperature shifts equilibrium forward and increases methanol yield.

Q87. The order of reaction of an elementary reaction is:

- (A) Equal to molecularity (B) Depend on temperature
(C) Can't predicted (D) Depends on concentration

✓ **Answer: (A) Equal to molecularity**

Explanation: For an elementary (one-step) reaction, the order equals the molecularity.

Q88. The rate of reaction when concentration becomes unity is called

- (A) Average rate (B) Instantaneous rate
(C) Rate constant (D) Rate of reaction

✓ **Answer: (C) Rate constant**

Explanation: Rate = $k[A]^m[B]^n$; when all concentrations are 1 mol/dm³, rate = k, the rate constant (specific rate constant).

Q89. If enthalpy change of a reaction is negative, then by increasing temperature reaction will move in which direction?

- (A) Forward (B) Reverse
(C) No change (D) First reverse then forward

✓ **Answer: (B) Reverse**

Explanation: A negative ΔH means the forward reaction is exothermic; increasing temperature favours the endothermic reverse reaction.

Q90. Which element will undergo oxidation preferably:

- (A) With low reduction potential (B) With high reduction potential
(C) With low oxidation potential (D) Cannot be predicted

✓ **Answer: (A) With low reduction potential**

Explanation: An element with low (more negative) reduction potential loses electrons easily, so it is oxidised preferentially.

Q91. In a redox reaction, the reducing agent is the species that:

- (A) Gains electrons (B) Loses electrons
(C) Remains unchanged (D) decrease in its oxidation state

✓ **Answer: (B) Loses electrons**

Explanation: The reducing agent loses electrons (is itself oxidised) and its oxidation state increases.

Q92. The surface of Triton, a moon of Neptune, contains condensed methane that flows rapidly. Which statement explains why condensed methane flow rapidly?

- (A) Condensed methane has a metallic structure
(B) Methane molecules contain strong covalent bonds
(C) The intermolecular forces between methane molecules are weak
(D) methane molecules have a tetrahedral shape

✓ **Answer: (C) The intermolecular forces between methane molecules are weak**

Explanation: Methane is non-polar with only weak London dispersion forces between molecules, so condensed methane flows easily.

Q93. Which of the following statement is true for water (temperature between 4° C to 0° C)

- (A) The volume of water decreases on cooling
- (B) The density of water increases on cooling
- (C) The density of water decreases on cooling
- (D) The mass of decreases on cooling

✓ **Answer: (C) The density of water decreases on cooling**

Explanation: Water is anomalous: its density is maximum at 4 °C. On cooling from 4 °C to 0 °C it expands, so density decreases.

Q94. Number of sigma bond and pi bonds in acetylene are?

- (A) 3 & 1
- (B) 1 & 3
- (C) 5 & 2
- (D) 3 & 2

✓ **Answer: (D) 3 & 2**

Explanation: $\text{H-C}\equiv\text{C-H}$ has 2 C-H σ bonds and 1 C-C σ bond (3 σ), plus 2 π bonds in the triple bond.

Q95. Which compound will have a maximum dipole moment?

- (A) CH_4
- (B) CCl_4
- (C) CH_3Cl
- (D) C_2H_4

✓ **Answer: (C) CH_3Cl**

Explanation: CH_4 and CCl_4 are symmetric (zero dipole); C_2H_4 is also non-polar. CH_3Cl has a polar C-Cl bond with no cancellation, so it has the highest dipole moment.

Q96. Which of the following elements has the lowest electronegativity value?

- (A) Flourine
- (B) Iodine
- (C) Lithium
- (D) Cesium

✓ **Answer: (D) Cesium**

Explanation: Electronegativity decreases down a group and increases across a period; caesium (group 1, period 6) has the lowest of these.

Q97. Sodium metal reacts with Ice cold water to produce:

- (A) NaOH
- (B) Na_2O
- (C) Na_2O_2
- (D) NaCl

✓ **Answer: (A) NaOH**

Explanation: $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$. Sodium reacts even with ice-cold water to give sodium hydroxide and hydrogen.

Q98. Outer-Transition elements are also called;

- (A) s-block elements
- (B) p-block elements
- (C) d-block elements
- (D) f-block elements

✓ **Answer: (C) d-block elements**

Explanation: d-block elements are called outer transition elements; f-block elements (lanthanides/actinides) are inner transition elements.

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Q99. Those molecules which have chiral center but not mirror image of one another is called

- (A) Epimers (B) Enantiomers
(C) Diastereomers (D) Anomers

✓ **Answer: (C) Diastereomers**

Explanation: Stereoisomers with chiral centres that are not mirror images of each other are diastereomers.

Q100. Select free radical involved in initiation of halogenation of methane

- (A) Cl (B) CH₃
(C) CH₄ (D) CH₃Cl

✓ **Answer: (A) Cl**

Explanation: UV light splits Cl₂ homolytically into chlorine free radicals (Cl•) in the initiation step.

Q101. Alkenes are less acidic than alkynes due to

- (A) Higher s character (B) Lesser s character
(C) Stronger bonds (D) Higher electronegativity

✓ **Answer: (B) Lesser s character**

Explanation: Alkene carbon is sp² (33% s-character) while alkyne carbon is sp (50%); lesser s-character makes alkenes less acidic.

Q102. 1,3 Butadiene is more stable than 1-Butene, because it is a:

- (A) Conjugated Alkene (B) Cumulenes
(C) Isolated diene (D) Separated dienes

✓ **Answer: (A) Conjugated Alkene**

Explanation: 1,3-butadiene has conjugated double bonds; delocalisation of π electrons makes it more stable.

Q103. Name of (C₂H₅)₄C

- (A) Triethyl methane (B) Tetramethyl methane
(C) Tetraethyl methane (D) Trimethyl ethane

✓ **Answer: (C) Tetraethyl methane**

Explanation: (C₂H₅)₄C is a central carbon with four ethyl groups — tetraethyl methane (3,3-diethylpentane).

Q104. Free radicals are produced by

- (A) Homolytic cleavage (B) heterolytic cleavage
(C) reducing agents (D) Oxidizing agents

✓ **Answer: (A) Homolytic cleavage**

Explanation: In homolytic cleavage the bond breaks evenly and each atom keeps one electron, giving free radicals.

Q105. Compared to benzene, nitration of toluene takes place at?

- (A) Same rate (B) Slow rate
(C) Faster rate (D) Very slow rate

✓ **Answer: (C) Faster rate**

Explanation: The $-\text{CH}_3$ group of toluene is electron-donating (activating), so nitration occurs faster than in benzene.

Q106. During Hydro halogenation of asymmetric alkenes which rule favors formation of secondary carbocation over primary carbocation?

- (A) Hydration rule (B) Anti-Markovnikov's rule
(C) Markovnikov's rule (D) Polymeros's rule

✓ **Answer: (C) Markovnikov's rule**

Explanation: Markovnikov's rule: H adds to the carbon with more H atoms, forming the more stable secondary carbocation.

Q107. Which reagent is used to distinguish 1-butyne and 2-butyne

- (A) water in the presence of mercuric sulphate and sulfuric acid
(B) ammonical silver nitrate
(C) Acidified potassium manganate(VII)
(D) aqueous bromine

✓ **Answer: (B) ammonical silver nitrate**

Explanation: 1-butyne is a terminal alkyne with an acidic $\equiv\text{C-H}$, giving a white precipitate with ammoniacal AgNO_3 ; 2-butyne does not react.

Q108. ____ can be added, to an alkyl halide to increase the no. of carbon atoms in the parent chain.

- (A) HCN in ethanol (B) KCN in ethanol
(C) Iodoform (D) Amine.

✓ **Answer: (B) KCN in ethanol**

Explanation: KCN in ethanol substitutes the halogen with $-\text{CN}$ ($\text{R-X} \rightarrow \text{R-CN}$), increasing the carbon chain by one carbon.

Q109. Which reagent gives white precipitates when added to phenol

- (A) aq bromine (B) aq Na_2CO_3
(C) aq NaOH (D) aq NaOH and benzoyl chloride

✓ **Answer: (A) aq bromine**

Explanation: Phenol reacts with bromine water to give a white precipitate of 2,4,6-tribromophenol.

Q110. Which of the following is more acidic?

- (A) Phenol (B) o-methyl phenol
(C) o- nitro phenol (D) o-Aminophenol

✓ **Answer: (C) o- nitro phenol**

Explanation: The $-\text{NO}_2$ group is strongly electron-withdrawing and stabilises the phenoxide ion, so o-nitrophenol is most acidic. $-\text{CH}_3$ and $-\text{NH}_2$ decrease acidity.

Q111. Which of these compounds reacts immediately with Lucas reagent and forms an oily layer by turning the solution turbid?

- (A) 2-butanol (B) 2-methyl-2-butanol
(C) 1-propanol (D) 4-methylphenol (p-cresol)

✓ **Answer: (B) 2-methyl-2-butanol**

Explanation: 2-methyl-2-butanol is a tertiary alcohol; tertiary alcohols react immediately with Lucas reagent (ZnCl_2/HCl), turning it turbid.

Q112. Which of the following gives positive silver mirror test:

- (A) $\text{CH}_3\text{CH}_2\text{OH}$ (B) CH_3CHO
(C) CH_3COOH (D) CH_3COCH_3

✓ **Answer: (B) CH_3CHO**

Explanation: Aldehydes (CH_3CHO) reduce Tollens' reagent to metallic silver — silver mirror test. Ketones, alcohols and acids do not.

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Q113. Select the acid catalyzed addition reactions of carboxyl compounds from the following:

- (A) Addition of Grignard reaction (B) Addition of sodium bisulphite
(C) Addition of alcohols (D) Addition of hydrogen cyanide

✓ **Answer: (C) Addition of alcohols**

Explanation: Addition of alcohols to carbonyl compounds (forming hemiacetals/acetals) is acid-catalysed. HCN and NaHSO_3 additions are base-catalysed.

Q114. When an aldehyde or ketone is reduced using LiAlH_4 followed by hydrolysis, the resultant would be

- (A) 1° alcohol from both aldehyde and ketone.
(B) 1° alcohol from aldehyde and 2° alcohol from ketone.
(C) 2° alcohol from both aldehyde and ketone.
(D) 2° alcohol from aldehyde and 3° alcohol from ketone.

✓ **Answer: (B) 1° alcohol from aldehyde and 2° alcohol from ketone.**

Explanation: LiAlH_4 reduces aldehydes to 1° alcohols and ketones to 2° alcohols.

Q115. Acetic acid and ethanol reacts to produce

- (A) Aldehyde (B) Ethyl acetate
(C) Nitrile (D) Ketone

✓ **Answer: (B) Ethyl acetate**

Explanation: $\text{CH}_3\text{COOH} + \text{C}_2\text{H}_5\text{OH} \rightleftharpoons \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}$ (esterification) gives ethyl acetate.

Q116. Prosthetic groups are part of the following _____ protein

- (A) Derived (B) Conjugated
(C) Simple (D) Non-derived

✓ **Answer: (B) Conjugated**

Explanation: Conjugated proteins contain a non-protein part called a prosthetic group (e.g. haem in haemoglobin).

Q117. Acrylate base polymers are:

- (A) Drying adhesives (B) Pressure sensitive adhesives
(C) Contact adhesives (D) Hot adhesives

✓ **Answer: (B) Pressure sensitive adhesives**

Explanation: Acrylate-based polymers are used as pressure-sensitive adhesives (sticky tapes, labels).

Q118. What does the symbol (Δ) in a chemical equation represent?

- (A) Density (B) Direction
(C) Heat (D) Pressure

✓ **Answer: (C) Heat**

Explanation: The Δ symbol written over the arrow in an equation means heat is supplied.

Q119. Calculate the number of molecules in 244g of Benzoic acid? ($C_7H_6O_2$)

- (A) 12×10^{23} (B) 1.2×10^{24}
(C) 0.12×10^{31} (D) 12×10^{24}

✓ **Answer: (B) 1.2×10^{24}**

Explanation: Molar mass of $C_7H_6O_2$ = 122 g/mol; $244/122 = 2$ mol; $2 \times 6.02 \times 10^{23} = 1.2 \times 10^{24}$ molecules.

Q120. The probability of spin of an electron is supposed to be

- (A) 30% clockwise & 70% counterclockwise (B) 70% clockwise & 30% counterclockwise
(C) 50% clockwise & 50% counterclockwise (D) 90% clockwise & 10% counterclockwise

✓ **Answer: (C) 50% clockwise & 50% counterclockwise**

Explanation: An electron can spin clockwise or anticlockwise with equal probability — 50% each.

Q121. An ion with a trinegative charge (-3) has valence shell electronic configuration of $1s^2 2s^2 2p^6 3s^2 3p^6$. To which period and group of the periodic table does the given element belong?

- (A) Period III and Group IIIA (B) Period III and Group VA
(C) Period V and Group IIIA (D) Period V and Group VA

✓ **Answer: (B) Period III and Group VA**

Explanation: X^{3-} has 18 electrons, so X has 15 electrons = phosphorus ($1s^2 2s^2 2p^6 3s^2 3p^3$): period 3, group VA.

Q122. For an element "X", If the value of Principle quantum number (n) = 4, the largest value of magnetic quantum number " m " can be:

- (A) 1 (B) 2
(C) 3 (D) 4

✓ **Answer: (C) 3**

Explanation: For $n = 4$, the largest $l = 3$; m ranges from $-l$ to $+l$, so the largest $m = +3$.

Q123. A photon is moving with wave number $1.5 \times 10^{10} \text{ m}^{-1}$. its frequency is

- (A) 4.5×10^{18} (B) 3.0×10^{18}
(C) 4.5×10^{-18} (D) 3.0×10^{-18}

✓ **Answer: (A) 4.5×10^{18}**

Explanation: $\nu = c \times \text{wave number} = 3 \times 10^8 \times 1.5 \times 10^{10} = 4.5 \times 10^{18} \text{ Hz}$.

Q124. Ideal gas equation for one mole of H_2 is

- (A) $PV = nRT$ (B) $P_1V_1/T_1 = P_2V_2/T_2$
(C) $PV/RT = 1$ (D) $P_1V_2T_2 = P_2V_1T_1$

✓ **Answer: (C) $PV/RT = 1$**

Explanation: For one mole ($n = 1$), $PV = RT$, i.e. $PV/RT = 1$.

Q125. Value of concentration for 1 mol of an ideal gas at STP will be:

- (A) 0.04 (B) 0.4
(C) 4.4 (D) 4

✓ **Answer: (A) 0.04**

Explanation: At STP 1 mol occupies 22.4 dm^3 , so concentration = $1/22.4 \approx 0.045 \approx 0.04 \text{ mol/dm}^3$.

Q126. The ideal gas equation is a combination of ____ laws.

- (A) Charles's, Boyle's (B) Charles's, Avogadro's
(C) Boyle's, Avogadro's (D) Charles's, Boyle's, Avogadro's

✓ **Answer: (D) Charles's, Boyle's, Avogadro's**

Explanation: $PV = nRT$ combines Boyle's law, Charles's law and Avogadro's law.

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PHYSICS

Q127-Q162 · 36 MCQs

Q127. In SHM the maximum displacement covered by the Particle from mean position is

- (A) $2A$ (B) $4A$
(C) $6A$ (D) $8A$

✓ **Answer: (B) $4A$**

Explanation: Maximum displacement from the mean is the amplitude (A). The key takes it as the total distance covered in one complete vibration, which is $4A$.

Q128. If the velocity is doubled then the K.E of the body will be:

- (A) Double (B) Three times
(C) Four times (D) Remains constant

✓ **Answer: (C) Four times**

Explanation: $K.E = \frac{1}{2}mv^2$; doubling v makes K.E four times.

Q129. When a force is parallel to the direction of motion of the body, work done on the body is:

- (A) Zero
- (B) minimum
- (C) maximum
- (D) Infinite

✓ **Answer: (C) maximum**

Explanation: $W = Fd \cos \theta$. When force is parallel to motion $\theta = 0^\circ$, $\cos \theta = 1$, so work is maximum.

Q130. The wheel of a vehicle is spinning in the anticlockwise direction, with a constant rate. The direction of its angular velocity will be:

- (A) clockwise
- (B) anticlockwise
- (C) perpendicular to the plane of rotation
- (D) along the plane of rotation

✓ **Answer: (C) perpendicular to the plane of rotation**

Explanation: Angular velocity is an axial vector along the axis of rotation — perpendicular to the plane of rotation (right-hand rule).

Q131. A point P is on a disk rotating with constant angular velocity. If the distance from the center is tripled, what happens to the ratio of linear velocity and angular velocity (v/ω)?

- (A) It remains the same
- (B) It triples
- (C) It is reduced to one-third
- (D) It increases by factor 9

✓ **Answer: (B) It triples**

Explanation: $v = r\omega$, so $v/\omega = r$. Tripling the distance from the centre triples the ratio.

Q132. In deriving Bernoulli's equation, the quantity 'pressure x volume' represents:

- (A) density
- (B) kinetic energy
- (C) potential energy
- (D) work done

✓ **Answer: (D) work done**

Explanation: In deriving Bernoulli's equation, pressure $\times$ volume ($P \times \Delta V$) is the work done on the fluid.

Q133. Drag force on a spherical object moving through a fluid depends on

- (A) velocity of the object
- (B) viscosity of the medium
- (C) shape and size of the object
- (D) all of the above

✓ **Answer: (D) all of the above**

Explanation: Stokes' law $F = 6\pi\eta rv$: drag depends on velocity, viscosity, and size/shape of the object.

Q134. Which of the following assumptions is INCORRECT about the fluid that follows equation of continuity?

- (A) It is a non-viscous fluid
- (B) It moves in a steady flow
- (C) It moves in a turbulent flow
- (D) It is an incompressible fluid

✓ **Answer: (C) It moves in a turbulent flow**

Explanation: The equation of continuity assumes steady (streamline), non-viscous, incompressible flow. Turbulent flow is not assumed.

Q135. In a ripple tank 50 waves having wavelength 5cm pass through a certain point with a speed of 2m/s. The frequency of waves is:

- (A) 5 Hz (B) 10 Hz
(C) 40 Hz (D) 50 Hz

✓ **Answer: (C) 40 Hz**

Explanation: $f = v/\lambda = 2 \text{ m/s} \div 0.05 \text{ m} = 40 \text{ Hz}$.

Q136. Unlike electromagnetic waves mechanical waves require:

- (A) source of energy (B) medium for propagation
(C) source of disturbance (D) periodic motion

✓ **Answer: (B) medium for propagation**

Explanation: Mechanical waves need a material medium to travel; electromagnetic waves can travel through vacuum.

Q137. A sound wave is set up in a long tube, closed at one end. The length of the tube is adjusted until the sound from the tube is loudest. What is the nature of the sound wave in the tube?

- (A) longitudinal and progressive (B) longitudinal and stationary
(C) transverse and progressive (D) transverse and stationary

✓ **Answer: (B) longitudinal and stationary**

Explanation: Sound in air is longitudinal; resonance (loudest sound) in a closed tube is due to stationary waves.

Q138. An ideal gas is heated at constant volume. It absorbs 200 J of heat. The work done by the gas is:

- (A) 200 J (B) 0 J
(C) -200 J (D) Varies with pressure

✓ **Answer: (B) 0 J**

Explanation: At constant volume $\Delta V = 0$, so $W = P\Delta V = 0 \text{ J}$; all heat goes to internal energy.

Q139. If "Q" heat and "W" is work done then "W=Q" represents.

- (A) Isothermal process (B) Adiabatic process
(C) Isochoric process (D) Isobaric process

✓ **Answer: (A) Isothermal process**

Explanation: In an isothermal process $\Delta U = 0$, so by the first law $Q = W$.

Q140. 1 mega ohm x 1 pico farad =

- (A) second (B) milli second
(C) micro second (D) mega second

✓ **Answer: (C) micro second**

Explanation: $RC = 10^6 \Omega \times 10^{-12} \text{ F} = 10^{-6} \text{ s} = 1 \text{ microsecond (time constant)}$.

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Q141. If "F" is the force between two points charges submerged in a medium of dielectric constant "M", then on withdrawing the medium, the force between them becomes:

- (A) $F\sqrt{M}$ (B) $F M$
(C) F/M (D) M/F

✓ **Answer: (B) $F M$**

Explanation: In a medium $F = F_0/\epsilon_r$, so $F_0 = F \times M$. Removing the medium increases the force M times.

Q142. Unit of resistivity i.e. specific resistance is:

- (A) $\Omega \text{ m}$ (B) Ω
(C) $\Omega^{-1}\text{m}^{-1}$ (D) $\Omega \text{ m}^2$

✓ **Answer: (A) $\Omega \text{ m}$**

Explanation: $\rho = RA/L$, so unit = $\Omega \times \text{m}^2/\text{m} = \Omega \text{ m}$.

Q143. If diameter of a wire is doubled, its resistivity will:

- (A) become half (B) decrease by four times
(C) increases by four times (D) remain constant

✓ **Answer: (D) remain constant**

Explanation: Resistivity depends only on the material and temperature, not on dimensions, so it remains constant.

Q144. Two particles with same charge and different masses enters perpendicularly in a uniform magnetic field with same speed, the lighter one will move in:

- (A) Straight path (B) Spiral path
(C) Large circular path (D) Small circular path

✓ **Answer: (D) Small circular path**

Explanation: $r = mv/qB$. With same q, v and B, the lighter particle has a smaller radius.

Q145. Which quantity is a vector?

- (A) pressure (B) temperature
(C) weight (D) work

✓ **Answer: (C) weight**

Explanation: Weight is a force (mg) directed toward the earth's centre, so it is a vector. Pressure, temperature and work are scalars.

Q146. During uniform circular motion, if "v" is tangential velocity, " ω " is angular velocity and "r" is radius. Then which of the following represents cross product correctly

- (A) $\omega = v \times r$ (B) $r = \omega \times v$
(C) $v = r \times \omega$ (D) $v = \omega \times r$

✓ **Answer: (D) $v = \omega \times r$**

Explanation: Linear velocity $v = \omega \times r$ (angular velocity crossed with position vector).

Q147. Cross product of two parallel vectors has a magnitude:

- (A) A (B) $A\cos\theta$
(C) zero (D) null vector

✓ **Answer: (C) zero**

Explanation: $|A \times B| = AB \sin \theta$; for parallel vectors $\theta = 0^\circ$, so magnitude = 0.

Q148. Projectile motion is best described as:

- (A) One-dimensional motion
- (B) Variable accelerated motion
- (C) Constant acceleration due to gravity
- (D) Velocity becomes zero at maximum height

✓ **Answer: (C) Constant acceleration due to gravity**

Explanation: A projectile moves under constant downward acceleration due to gravity (g).

Q149. A body of mass 5kg is moving with speed 10 m/s. A constant force acts on it for 5 seconds and brings it speed to 5 m/s. The magnitude of force is:

- (A) 3 N
- (B) 5 N
- (C) 15 N
- (D) 30 N

✓ **Answer: (B) 5 N**

Explanation: $a = (5 - 10)/5 = -1 \text{ m/s}^2$; $F = ma = 5 \times 1 = 5 \text{ N}$.

Q150. A passenger standing in a bus falls forward when the bus suddenly stops. This is due to:

- (A) Newton's first law
- (B) Newton's second law
- (C) Newton's third law
- (D) Law of gravitation

✓ **Answer: (A) Newton's first law**

Explanation: Inertia (Newton's first law): the body keeps moving forward when the bus stops.

Q151. A stone is thrown horizontally with a velocity of 12 m/s from the top of a vertical cliff. How long stone takes to reach the ground 45 m below? Take $g = 10 \text{ m/s}^2$

- (A) 2 s
- (B) 3 s
- (C) 4 s
- (D) 5 s

✓ **Answer: (B) 3 s**

Explanation: Vertical: $h = \frac{1}{2}gt^2$; $45 = 5t^2$, $t = 3 \text{ s}$. Horizontal speed does not affect fall time.

Q152. If the force applied on an object and its velocity are in the same direction, the power delivered to the object is:

- (A) Zero
- (B) Positive
- (C) Negative
- (D) Infinite

✓ **Answer: (B) Positive**

Explanation: $P = F \cdot v = Fv \cos 0^\circ$ — positive when force and velocity are in the same direction.

Q153. Magnetic flux has unit but no direction because

- (A) of scalar product
- (B) of cross product
- (C) of sum of two vectors
- (D) of product of two scalars

✓ **Answer: (A) of scalar product**

Explanation: $\Phi = B \cdot A$ is a dot (scalar) product, so flux is a scalar.

Q154. According to the Faraday's law of electromagnetic induction, the magnitude of induced emf depends upon:

- (A) magnetic flux (B) magnetic induction
(C) change in magnetic flux (D) rate of change in magnetic flux

✓ **Answer: (D) rate of change in magnetic flux**

Explanation: Faraday's law: induced emf = $-N \Delta\Phi/\Delta t$ — it depends on the rate of change of magnetic flux.

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Q155. Lenz's law primarily refers to the direction of:

- (A) Voltage (B) Induced current
(C) Power (D) Energy

✓ **Answer: (B) Induced current**

Explanation: Lenz's law gives the direction of the induced current: it opposes the change that produces it.

Q156. When a capacitor is connected to an alternating power source,

- (A) the voltage leads the current by 90° (B) the voltage lags the current by 90°
(C) the voltage leads the current by 180° (D) the voltage lags the current by 180°

✓ **Answer: (B) the voltage lags the current by 90°**

Explanation: In a purely capacitive circuit current leads voltage by 90° , i.e. voltage lags current by 90° .

Q157. In a pure inductive AC circuit at low frequency the inductive reactance will be

- (A) remain same (B) increase
(C) decrease (D) zero

✓ **Answer: (C) decrease**

Explanation: $X_L = 2\pi fL$, so at low frequency inductive reactance decreases.

Q158. Which type of biasing results in a very high resistance of PN junction diode?

- (A) Forward biasing (B) Reverse biasing
(C) Unbiased (D) Doping

✓ **Answer: (B) Reverse biasing**

Explanation: Reverse bias widens the depletion region, giving very high resistance.

Q159. The energy difference per unit frequency between two consecutive quantum states is

- (A) speed of light (B) Frequency
(C) Planck's Constant (D) Mass

✓ **Answer: (C) Planck's Constant**

Explanation: $E = hf$, so $h = E/f$ is energy per unit frequency — Planck's constant.

Q160. What is the primary reason for color line spectrum of hydrogen gas?

- (A) the heat energy inside gas
- (B) Transition of electrons from lower to higher energy levels in gas atoms
- (C) Transition of electrons from higher to lower energy levels in gas atoms
- (D) instability of gas atoms

✓ **Answer: (C) Transition of electrons from higher to lower energy levels in gas atoms**

Explanation: Excited electrons fall from higher to lower energy levels and emit photons of definite frequencies, producing the line spectrum.

Q161. A sealed sample of Cobalt-60 is subjected to extremely high pressure in a laboratory. Its decay rate will:

- (A) increase
- (B) decrease
- (C) remain unchanged
- (D) become infinite

✓ **Answer: (C) remain unchanged**

Explanation: Radioactive decay is a nuclear process, unaffected by pressure, temperature or chemical state.

Q162. Half-life of a radioactive element is 2 minutes. In how much time, one - eighth (1/8th) of this sample will decay?

- (A) 2 minutes
- (B) 4 minutes
- (C) 6 minutes
- (D) 8 minutes

✓ **Answer: (C) 6 minutes**

Explanation: $1 \rightarrow 1/2 \rightarrow 1/4 \rightarrow 1/8$ takes 3 half-lives = $3 \times 2 = 6$ minutes (1/8 of the sample remaining).

ENGLISH

Q163-Q171 · 9 MCQs

Q163. Choose the sentence with correct punctuation:

- (A) "It was a nice movie," said Kaleem.
- (B) "it was a nice movie, said Kaleem.
- (C) "It was a nice, movie;" said Kaleem.
- (D) "It was a nice movie, "said Kaleem".

✓ **Answer: (A) "It was a nice movie," said Kaleem.**

Explanation: The comma goes inside the closing quotation marks and the speech starts with a capital letter: "It was a nice movie," said Kaleem.

Q164. "He walked _____ the park to reach school." Use correct preposition:

- (A) across
- (B) at
- (C) over
- (D) on

✓ **Answer: (A) across**

Explanation: 'Across' means from one side to the other of an area — he walked across the park.

Q165. Choose the correct indirect form for the following sentence: "Where do you live?" he asked the old man.

- (A) He asked the old man where he has lived.
- (B) He asked the old man where do I live.
- (C) He asked the old man where he lived.
- (D) He asked the old man where did he live.

✓ **Answer: (C) He asked the old man where he lived.**

Explanation: In indirect speech a question becomes a statement and past tense shifts: 'where he lived'.

Q166. Complete the sentence with correct infinitive. He bade them _____ the house.

- (A) For leaving (B) Leave
(C) leaving (D) To leave

✓ **Answer: (B) Leave**

Explanation: After 'bid/bade', the bare infinitive (without 'to') is used: He bade them leave the house.

Q167. Choose the option with correct spelling.

- (A) Nulance (B) Neusance
(C) Nuisance (D) Nuissance

✓ **Answer: (C) Nuisance**

Explanation: The correct spelling is 'nuisance'.

Q168. Choose the correctly structured sentence.

- (A) If he went on time, he will have caught the bus.
(B) If he had gone on time, he would have caught the bus.
(C) If he had gone on time, he would catch the bus.
(D) If he has gone on time, he would have caught the bus.

✓ **Answer: (B) If he had gone on time, he would have caught the bus.**

Explanation: Third conditional: If + past perfect, would have + past participle.

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Q169. "The students, along with their teacher, _____ leaving now." Choose the correct verb:

- (A) is (B) are
(C) has (D) was

✓ **Answer: (B) are**

Explanation: 'Along with their teacher' is extra information; the subject is 'students' (plural), so 'are'.

Q170. "Your reluctance to speak to the boss will create problems for you." What does "reluctance" mean in this context?

- (A) Confidence (B) Hesitation
(C) Eagerness (D) Competence

✓ **Answer: (B) Hesitation**

Explanation: Reluctance means unwillingness or hesitation.

Q171. "The silence tasted like stale bread left too long in the cupboard" Which literary technique is most evident here?

- (A) Metaphor (B) Personification
(C) Simile (D) Alliteration

✓ **Answer: (C) Simile**

Explanation: A comparison using 'like' is a simile.

LOGICAL REASONING

Q172-Q180 · 9 MCQs

Q172. Initially, a quantity of the liquid is 160 ml and it reduces by half every hour. How much liquid remains after two hours?

- (A) 20 ml (B) 40 ml
(C) 60 ml (D) 80 ml

✓ **Answer: (B) 40 ml**

Explanation: $160 \rightarrow 80$ (after 1 hour) $\rightarrow 40$ ml (after 2 hours).

Q173. An item originally costs Rs. 2500. After a 10% price increase, what is the new price?

- (A) Rs. 2250 (B) Rs. 2700
(C) Rs. 2750 (D) Rs. 2800

✓ **Answer: (C) Rs. 2750**

Explanation: 10% of $2500 = 250$; $2500 + 250 = \text{Rs. } 2750$.

Q174. If you work hard, you will pass the exam. Which of the following statements can be deduced from the above statement?

I: If you don't work hard, you will not pass the exam.

II: If you don't pass the exam, you have not worked hard.

- (A) only I (B) only II
(C) both I and II (D) neither I nor II

✓ **Answer: (B) only II**

Explanation: 'If P then Q' is logically equal to 'if not Q then not P' (contrapositive, statement II). Statement I is the inverse, which does not follow.

Q175. If 5 is subtracted from 30, what will be the square root of remaining?

- (A) 25 (B) 30
(C) 5 (D) 10

✓ **Answer: (C) 5**

Explanation: $30 - 5 = 25$; $\sqrt{25} = 5$.

Q176. Statement: A hospital staff shortage is causing long patient waiting times.

Course of Action:

I. Hire temporary staff and reschedule duties to manage the patient's workload.

II. Close the hospital until full staffing is restored.

- (A) Only I follows (B) Only II follows
(C) Both I and II follows (D) Neither follows

✓ **Answer: (A) Only I follows**

Explanation: Hiring temporary staff directly addresses the problem; closing the hospital is impractical and harmful.

Q177. What makes a course of action realistic and executable?

- (A) Minimal risk
- (B) Attainable goals, detailed steps, and availability of appropriate resources
- (C) High expenses
- (D) Unclear execution plans

✓ **Answer: (B) Attainable goals, detailed steps, and availability of appropriate resources**

Explanation: A realistic course of action has attainable goals, clear detailed steps and the resources to carry it out.

Q178. How does positive thinking influence social behavior?

- (A) It encourages social conflicts among the people.
- (B) It encourages mutual respect among the people.
- (C) It develops self-centeredness among the people.
- (D) It encourages isolation among the people.

✓ **Answer: (B) It encourages mutual respect among the people.**

Explanation: Positive thinking builds trust, cooperation and mutual respect among people.

Q179. In how many way(s), four persons A, B, C and D can stand in a line, if B must be at first and D is at third position?

- (A) 1
- (B) 2
- (C) 3
- (D) 4

✓ **Answer: (B) 2**

Explanation: B and D are fixed; A and C fill the 2nd and 4th places in $2! = 2$ ways.

Q180. Eman has 4 times as many books as Ayesha and 5 times as many as Khadijah. If Khadijah has more than 40 books, what is the least number of books that Eman could have?

- (A) 200
- (B) 205
- (C) 210
- (D) 220

✓ **Answer: (D) 220**

Explanation: Eman must be a multiple of 4 and 5 (i.e. of 20), and $\text{Eman} = 5 \times \text{Khadijah}$ with $\text{Khadijah} > 40$.
Khadijah must be a multiple of 4: $44 \rightarrow \text{Eman} = 220$.

Answer Key — SZABMU MDCAT Paper 2026 (Paper Code 2)

Quick reference for all 180 MCQs. Colours follow the subject sections.

1 D	21 A	41 A	61 B	81 D	101 B	121 B	141 B	161 C
2 A	22 C	42 B	62 C	82 B	102 A	122 C	142 A	162 C
3 C	23 B	43 D	63 D	83 B	103 C	123 A	143 D	163 A
4 B	24 C	44 A	64 B	84 A	104 A	124 C	144 D	164 A
5 A	25 A	45 A	65 A	85 A	105 C	125 A	145 C	165 C
6 B	26 D	46 D	66 B	86 D	106 C	126 D	146 D	166 B
7 C	27 B	47 D	67 A	87 A	107 B	127 B	147 C	167 C
8 B	28 B	48 C	68 D	88 C	108 B	128 C	148 C	168 B
9 B	29 A	49 A	69 C	89 B	109 A	129 C	149 B	169 B
10 A	30 C	50 C	70 A	90 A	110 C	130 C	150 A	170 B
11 B	31 B	51 C	71 B	91 B	111 B	131 B	151 B	171 C
12 A	32 D	52 A	72 D	92 C	112 B	132 D	152 B	172 B
13 B	33 D	53 C	73 C	93 C	113 C	133 D	153 A	173 C
14 B	34 B	54 A	74 B	94 D	114 B	134 C	154 D	174 B
15 A	35 C	55 D	75 B	95 C	115 B	135 C	155 B	175 C
16 C	36 A	56 C	76 D	96 D	116 B	136 B	156 B	176 A
17 C	37 B	57 C	77 B	97 A	117 B	137 B	157 C	177 B
18 B	38 D	58 B	78 C	98 C	118 C	138 B	158 B	178 B
19 C	39 C	59 A	79 B	99 C	119 B	139 A	159 C	179 B
20 D	40 D	60 C	80 B	100 A	120 C	140 C	160 C	180 D

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