MDCAT (ETEA entry test, Paper MDCAT-1) — 2012 · Solved Past Paper

Body: Educational Testing and Evaluation Agency (ETEA) · **Post:** MDCAT (ETEA entry test, Paper MDCAT-1) · **Year:** 2012 · **Questions:** 200 in the original paper — **200 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 2012 sitting.

Source note: Question stems and options: ETEA MDCAT 2012, Paper MDCAT-1 ("Medical and Engineering Papers 2010-2017", compiled by M. Nawaz Khan Abbasi, Scribd doc 363367615, Medical Paper 2012, book pp. 93-101; compilation answer key p. 149, Q1-200 complete, 0 dual-letter entries, 0 "not given" entries). Exam held Sunday 15 July 2012, 09:00 AM-12:00 (thefreelibrary: test 15 July 2012, Army Stadium Peshawar + Ayub Medical College Abbottabad; booknstuff.com: test 15 July 2012, result 16 July 2012; pakmed.net: Entrance Test 2012 conducted 15 July 2012 by KMU and ETEA). Printed (compiler) key letter counts A52 / B55 / C45 / D48. Served answer balance A52 / B53 / C46 / D49. Subjects Biology/Chemistry/Physics/English interleaved across Q1-Q200 (no subject sections in the printed paper). 5 PICK-ONE (Q25, Q39, Q108, Q146, Q200), 3 printed-key errors corrected (Q33, Q88, Q103) and 0 DEFECTIVE-excluded. Six questions (Q93, Q122, Q126, Q161, Q173, Q181) carry private-use glyphs in the Scribd text layer for mathematical symbols (sigma, reaction arrow, alpha/beta, the Kc fraction, the Bohr radius formula); the symbols were restored from context and recorded in each 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.

1 The sum of mole fractions of

The sum of mole fractions of solute and solvent is always equal to:

- A. 0.1
- B. 10.0
- C. 1.0 ✓ **Correct answer**
- D. Zero

A. wrong: the mole fractions of all components in a mixture add to one, not to 0.1.

B. wrong: 10.0 has no basis; mole fractions are each below one and sum to one.

C. correct: by definition the mole fractions of solute and solvent (all components) sum to exactly 1.

D. wrong: the sum is one, not zero.

Question 2 Two forces of magnitude 20 N

Two forces of magnitude 20 N and 10 N act at a point then which one of the following cannot be their possible sum?

- A. 30 N
- B. 10 N
- C. 35 N ✓ **Correct answer**
- D. 15 N

A. wrong: 30 N is the maximum possible resultant (20 + 10), so it is a possible sum.

B. wrong: 10 N is the minimum possible resultant (20 − 10), so it is a possible sum.

C. correct: the resultant of 20 N and 10 N must lie between 10 N and 30 N, so 35 N cannot occur.

D. wrong: 15 N lies between 10 N and 30 N, so it is a possible sum.

3 Glycolysis completes with the net gain

Glycolysis completes with the net gain of:

- A. 2 ATP ✓ **Correct answer**
- B. 3 ATP
- C. 4 ATP
- D. 32 ATP

A. correct: glycolysis produces 4 ATP but consumes 2 ATP in the investment phase, giving a net gain of 2 ATP.

B. wrong: no stage of glycolysis gives a net gain of 3 ATP.

C. wrong: 4 ATP is the gross production, not the net gain.

D. wrong: 32 ATP is of the order of the total yield of aerobic respiration, not of glycolysis alone.

Question 4 An Azeotropic mixture of two miscible

An Azeotropic mixture of two miscible liquids boils at lower temperature than its components when:

- A. The system shows negative deviation from Raoult's law.
- B. The system shows positive deviation from Raoult's law ✓ **Correct answer**
- C. The system perfectly obeys Raoult's law
- D. Both (A) and (B)

A. wrong: negative deviation gives a maximum-boiling azeotrope, which boils at a higher temperature than its components.

B. correct: positive deviation gives a minimum-boiling azeotrope, which boils at a lower temperature than either pure component.

C. wrong: an ideal solution forms no azeotrope at all.

ly positive deviation gives the lower-boiling azeotrope.

Question 5 When a force is applied to

When a force is applied to a body, several effects are possible. Which one of the following effects could not occur?

- A. The body speeds up
- B. The body rotates
- C. The body changes direction
- D. Mass of body decreases ✓ **Correct answer**

A. wrong: a force can accelerate a body, so speeding up is a possible effect.

B. wrong: a force applied off-centre produces a torque, so rotation is a possible effect.

C. wrong: a force can change the direction of motion, so this is a possible effect.

D. correct: applying a force cannot change the mass of the body, so this effect could not occur.

Question 6 When you go to Karachi please

When you go to Karachi, please

- A. Collect a good watch for me.
- B. Acquire a good watch for me.
- C. Bring a good watch for me. ✓ **Correct answer**
- D. Arrange a good watch for me.

A. wrong: “collect” means to gather or pick up from a place, not to carry something to the speaker.

B. wrong: “acquire” means to obtain or buy, not to bring it to the speaker.

C. correct: “bring” means to carry something towards the speaker, which is what is asked.

rrange' means to organise or put in order, not to carry it to the speaker.

Question 7 Restriction enzymes are of great use

Restriction enzymes are of great use in genetic engineering because:

- A. They cut DNA at a specific base level ✓ **Correct answer**
- B. They cut D.N.A at several specific levels
- C. They help in binding the pieces of D.N.A
- D. They are nuclease

A. correct: restriction enzymes (restriction endonucleases) recognise a specific base sequence and cut the DNA at that site, which is what makes them useful in genetic engineering.

B. wrong: each enzyme cuts at its own specific recognition site, not at several levels.

C. wrong: binding (ligation) is done by DNA ligase, not by restriction enzymes.

D. wrong: being a nuclease is a general property, not the reason they are useful; the reason is the site-specific cut.

Question 8 Optical fibers guides

Optical fibers guides:

- A. Current
- B. Light ✓ **Correct answer**
- C. Sound
- D. Voltage

A. wrong: optical fibres do not carry electric current.

B. correct: an optical fibre guides light along its length by total internal reflection.

C. wrong: sound is not guided by an optical fibre.

ltage is not what an optical fibre guides.

Question 9 Methanoic acid HCOOH has one carbon-oxygen

Methanoic acid HCOOH has one carbon-oxygen bond of length 123 PM and another of 136 PM. The C = O and C — O bond lengths respectively would be:

- A. 136 PM, 123 PM
- B. 123 PM and 136 PM ✓ **Correct answer**
- C. 136 PM, 136 PM
- D. 123 PM and 123PM

A. wrong: this reverses the two lengths; the double bond is the shorter one.

B. correct: the C=O double bond (123 pm) is shorter than the C—O single bond (136 pm), so the C=O length is 123 pm and the C—O length is 136 pm.

C. wrong: the two bonds have different lengths.

D. wrong: the two bonds have different lengths.

Question 10 Abscisic acid ABA promotes

Abscisic acid (ABA) promotes:

- A. Triple response
- B. Sex expression
- C. Flower initiation
- D. Leaf, flower and fruit fall ✓ **Correct answer**

A. wrong: the triple response (short, thick, curved seedling growth) is caused by ethylene, not by abscisic acid.

B. wrong: sex expression in plants is influenced by gibberellins and ethylene, not by abscisic acid.

wer initiation is promoted by florigen/gibberellins, not by abscisic acid.

D. correct: abscisic acid (ABA) promotes abscission, the shedding of leaves, flowers and fruits. (The source prints the stem as “Abcissic acid (AB(A) promotes:” — the “(ABA)” is garbled against the option label; the stem and option (A) are restored here as “Abscisic acid (ABA) promotes:” with option (A) “Triple response”.)

Question 11 Choose the compound in which hydrogen

Choose the compound in which hydrogen bonding is not possible?

- A. CH 3 OCH 3 ✓ **Correct answer**
- B. H 2 O
- C. CH 3 CH 2 OH
- D. CH 3 COOH

A. correct: dimethyl ether has no hydrogen attached to oxygen, so it cannot donate a hydrogen bond; of the options it is the one in which hydrogen bonding is not possible.

B. wrong: water has O—H bonds and forms hydrogen bonds readily.

C. wrong: ethanol has an O—H bond and forms hydrogen bonds.

D. wrong: acetic acid has an O—H bond and forms hydrogen bonds.

Question 12 The ratio of output voltage V

The ratio of output voltage V 0 to the voltage difference V in between the positive (+) input and negative (-) input of opamp is (where V in =V + – V – :

- A. Current gain
- B. Voltage gain ✓ **Correct answer**
- C. Open-loop gain
- D. Close-4oop gain

A. wrong: the ratio of output voltage to input voltage difference is a voltage ratio, not a

B. correct: gain is defined as output divided by input, so V0/Vin is the voltage gain of the op-amp.

C. wrong: the open-loop gain is the same ratio measured without feedback; the question asks for the name of the ratio itself, which is the voltage gain.

D. wrong: “close-4oop” is a misprint for closed-loop gain, which is the gain with feedback, not the name of the V0/Vin ratio.

Question 13 Why have you broken this jug

Why have you broken this jug? Passive form of the sentence is:

- A. Why has this jug been broken by you? ✓ **Correct answer**
- B. Why have this jug been broken by you?
- C. Why this jug has been broken by you?
- D. Why had that jug been broken by you?

A. correct: the active sentence is in the present perfect (“have broken”), so the passive is “has been broken” with the same tense and the question word “why” kept first.

B. wrong: “have” does not agree with the singular subject “this jug”; it must be “has”.

C. wrong: in a question the auxiliary (“has”) must come before the subject, not after it.

D. wrong: “had” is the past perfect, but the original is present perfect, and “that” changes “this”.

Question 14 Surplus amino acid in the body

Surplus amino acid in the body are broken down to form urea in:

- A. Spleen
- B. Kidneys

r ✓ Correct answer

- D. Pancreas

A. wrong: the spleen filters blood and stores blood cells; it does not convert amino acids to urea.

B. wrong: the kidneys excrete urea, but they do not form it.

C. correct: surplus amino acids are deaminated in the liver and the ammonia is converted to urea in the ornithine (urea) cycle.

D. wrong: the pancreas secretes digestive enzymes and insulin; it does not form urea.

Question 15 Lipids are chemically

Lipids are chemically:

- A. Acids
- B. Alcohols
- C. Ethers
- D. Esters ✓ **Correct answer**

A. wrong: lipids are not acids as a class.

B. wrong: lipids are not alcohols, though glycerol (an alcohol) is one part of a fat.

C. wrong: lipids are not ethers.

D. correct: lipids (fats and oils) are chemically esters of fatty acids with glycerol.

Question 16 The resistance of light dependant resistance

The resistance of light dependant resistance LDR:

- A. Increases with light
- B. Decreases with light ✓ **Correct answer**
- C. Decreases with darkness

ne of the above

A. wrong: light falling on an LDR lowers its resistance, it does not raise it.

B. correct: in a light-dependent resistor the resistance falls as the light intensity rises.

C. wrong: darkness raises the resistance of an LDR.

D. wrong: option (B) is correct.

Question 17 Remember to brush your teeth after

"Remember to brush your teeth after dinner," she said. Indirect form of the sentence is.

- A. She told him to remember to brush his teeth after dinner.
- B. She reminded him to brush his teeth after dinner. ✓ **Correct answer**
- C. She advised him to remember to brush his teeth after dinner.
- D. She said to him to remember to brush his teeth after dinner.

A. wrong: "remember to brush" is a reminder, and the indirect form uses "reminded", not "told".

B. correct: "Remember to …" reported as a reminder becomes "reminded him to brush his teeth after dinner".

C. wrong: the sentence is a reminder, not advice; "advised" changes the meaning.

D. wrong: "said to him to" is ungrammatical in indirect speech; the reporting verb must be "reminded" or "told".

Question 18 Which of the following represent the

Which of the following represent the bile salts?

- A. Bilirubin
- B. Biliverdin
- C. Haemoglobin

h (A) and (B) ✓ **Correct answer**

A. wrong on its own: bilirubin is one bile pigment, but the question asks for the bile salts as a pair.

B. wrong on its own: biliverdin is one bile pigment, but the question asks for the pair.

C. wrong: haemoglobin is the red blood pigment, not a bile salt.

D. correct: the textbook lists bilirubin and biliverdin together as the bile pigments carried in bile, so the pair is the keyed answer. (Strictly these are bile pigments rather than bile salts, but among the options the pair is the intended answer.)

Question 19 Benzene undergoes substitution reactions more easily

Benzene undergoes substitution reactions more easily than addition reactions because:

- A. of its cyclic nature
- B. of having three double bonds
- C. of aromatic character
- D. of delocalization of electrons ✓ **Correct answer**

A. wrong: being cyclic alone does not explain why substitution is preferred over addition.

B. wrong: three double bonds would favour addition, not substitution.

C. wrong: aromatic character is a description of the result, not the mechanism that makes substitution easier.

D. correct: the delocalised π-electrons give benzene its extra stability, so it resists addition (which would destroy the delocalisation) and undergoes substitution instead.

Question 20 The maximum kinetic energy of an

The maximum kinetic energy of an electron ejected from a metal by photon depends on:

- A. The photon’s frequency only ✓ **Correct answer**

metal work function

- C. The intensity of incident light
- D. None of the above

A. correct: the maximum kinetic energy is KEmax = hν − φ, so for a given metal (fixed φ) it depends only on the photon's frequency.

B. wrong: the work function is fixed for a given metal; it does not vary with the incident photon.

C. wrong: intensity changes the number of photoelectrons, not their maximum kinetic energy.

D. wrong: option (A) is correct.

Question 21 A spring system executes simple harmonic

A spring system executes simple harmonic motion. If a load is added to it then the time period of spring – mass system will be:

- A. increased ✓ **Correct answer**
- B. decreased
- C. the same
- D. halved

A. correct: the time period is T = 2π√(m/k), so adding a load (increasing m) increases the time period.

B. wrong: a larger mass gives a longer, not a shorter, period.

C. wrong: the period depends on the mass, so it changes when a load is added.

D. wrong: adding mass increases the period; it cannot halve it.

22 Conversion of excess glucose into fat

Conversion of excess glucose into fat is known as:

- A. Glycolysis
- B. Lipogenesis ✓ **Correct answer**
- C. Ketogenosis
- D. Glycogenesis

A. wrong: glycolysis is the breakdown of glucose to pyruvate, not its conversion to fat.

B. correct: lipogenesis is the synthesis of fats (lipids) from excess glucose.

C. wrong: ketogenesis is the formation of ketone bodies, not of fat.

D. wrong: glycogenesis is the conversion of glucose to glycogen, not to fat.

Question 23 Ring test is shown by compounds

Ring test is shown by compounds having:

- A. Sulphate radical
- B. Chloride radical
- C. Nitrate radical ✓ **Correct answer**
- D. None of the above

A. wrong: the ring test is not a test for sulphate.

B. wrong: chloride is tested with silver nitrate, not by the ring test.

C. correct: the brown ring test detects nitrate ions (a brown ring of [Fe(NO)]SO4 forms at the junction of the two liquids).

D. wrong: option (C) is correct.

24 The diode that converts electrical energy

The diode that converts electrical energy into light energy is called:

- A. Solar cell
- B. Photodiode
- C. Vacuum diode
- D. Light emitting diode ✓ **Correct answer**

A. wrong: a solar cell converts light energy into electrical energy, the reverse of what is asked.

B. wrong: a photodiode converts light into electrical current, not electrical energy into light.

C. wrong: a vacuum diode rectifies current; it does not emit light.

D. correct: an LED converts electrical energy into light energy.

Question 25 Choose the correct sentence out of

Choose the correct sentence out of the following:-

- A. The country was hard hit by the war.
- B. The country was hardly hit by the war.
- C. The country was severely hit by the war. ✓ **Correct answer**
- D. The country was more hardly hit by the war.

A. also acceptable: “hard hit” is idiomatic English (“hard-hit” areas), so this sentence is grammatical.

B. wrong: “hardly” means “barely”, which changes the meaning to “almost not hit”.

C. correct: “severely” is the standard adverb for the degree of damage, and this is the keyed answer.

D. wrong: “more hardly” is not correct comparative English. (PICK-ONE: options (A) and (C)

eptable English, the keyed answer (C) is filed. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

Question 26 Fatigue free musscles are

Fatigue free musscles are:

- A. Striped
- B. Unstriped
- C. Cardiac ✓ **Correct answer**
- D. Triceps

A. wrong: striped (skeletal) muscles fatigue after sustained work.

B. wrong: unstriped (smooth) muscles can fatigue, though more slowly than skeletal muscle.

C. correct: cardiac muscle works continuously throughout life without fatigue.

D. wrong: the triceps is a striped skeletal muscle, which does fatigue.

Question 27 Excretion of bile pigments in blood

Excretion of bile pigments in blood indicates:

- A. Anaemia
- B. Diabetes
- C. Rickets
- D. Jaundice ✓ **Correct answer**

A. wrong: anaemia is a deficiency of haemoglobin or red cells, not the presence of bile pigments in blood.

B. wrong: diabetes is raised blood sugar, not bile pigments in blood.

C. wrong: rickets is a vitamin D deficiency disease of the bones.

undice is the yellowing caused by excess bile pigments (bilirubin) in the blood.

Question 28 Which arrangement of the Photon is

Which arrangement of the Photon is in their decreasing energy?

- A. x rays > i.r. > u.v. > visible
- B. x rays > u.v. > visible > i.r. ✓ **Correct answer**
- C. u.v. > x rays > visible> i.r.
- D. i.r. > visible > x rays> u.v.

A. wrong: infrared has the lowest energy of the four, so it cannot come second.

B. correct: photon energy increases with frequency, so the order of decreasing energy is X-rays, ultraviolet, visible, infrared.

C. wrong: X-rays have higher energy than ultraviolet rays.

D. wrong: this is the reverse of the correct order; infrared has the lowest energy.

Question 29 The colours in the soap bubble

The colours in the soap bubble are due to:

- A. Interference ✓ **Correct answer**
- B. Dispersion of light
- C. Scattering of light
- D. Refraction of light

A. correct: the colours of a soap bubble come from the interference of light reflected from the two surfaces of the thin film.

B. wrong: dispersion (splitting into a spectrum) is what a prism does; it does not produce the bubble’s colours.

attering makes the sky blue, it does not colour a soap bubble.

D. wrong: refraction bends light but does not produce the bubble's colours.

Question 30 You did not kill a lion

You did not kill a lion in the forest. Passive form of the sentence as:

- A. A lion is not killed by you In the forest
- B. A lion was not killed by you in the forest. ✓ **Correct answer**
- C. A lion is killed not by you in the forest.
- D. A lion has not killed by you in the forest.

A. wrong: the original is past simple ("did not kill"), so the passive must use "was", not "is".

B. correct: the past-simple active "did not kill" becomes the past-simple passive "was not killed".

C. wrong: the tense is wrong ("is" for a past action) and "not" is misplaced.

D. wrong: this is ungrammatical (a lion as the subject of "has killed") and the tense is wrong.

Question 31 An individual with contrasting alleles is

An individual with contrasting alleles is called:

- A. Homozygous
- B. Monoecious
- C. Heterozygous ✓ **Correct answer**
- D. Dioecious

A. wrong: homozygous means the two alleles are the same.

B. wrong: monoecious means having male and female flowers on the same plant.

C. correct: an individual with two contrasting (different) alleles is heterozygous.

oecious means having male and female flowers on separate plants.

Question 32 Which is the strongest acid

Which is the strongest acid?

- A. CH 3 COOH
- B. Cl 2 CH COOH
- C. Cl CH 2 COOH
- D. Cl 3 C COOH ✓ **Correct answer**

A. wrong: acetic acid has no electron-withdrawing chlorine, so it is the weakest of the four.

B. wrong: dichloroacetic acid is strong, but weaker than the trichloro acid.

C. wrong: monochloroacetic acid is stronger than acetic acid but weaker than the di- and trichloro acids.

D. correct: three chlorine atoms exert the strongest electron-withdrawing effect, making trichloroacetic acid the strongest acid of the four.

Question 33 An object in a satellite orbiting

An object in a satellite orbiting around the earth is weightless because:

- A. g = 0
- B. No force acts on it
- C. Its motion is free fall ✓ **Correct answer**
- D. It is far away from earth

A. wrong: the acceleration due to gravity is not zero at the satellite's height; gravity is still acting.

B. wrong: this is the printed key, but it is incorrect — the Earth's gravity does act on the object.

e object and the satellite both fall freely under gravity, so there is no normal reaction and the apparent weight is zero.

D. wrong: the satellite is only a few hundred kilometres up, and distance is not the cause of weightlessness. (PRINTED-KEY ERROR CORRECTED: the printed key records (B) “No force acts on it”, but gravity does act on the object; the correct answer is (C) — the object is in free fall. Corrected by the assistant under the owner’s 8 Nov 2026 delegation.)

Question 34 The expression for binding energy is

The expression for binding energy is:

- A. E B =fh
- B. E B =[(ZM P + N M n } – Z M A]C 2 ✓ **Correct answer**
- C. E B = ZM P C 2 + N M n Z M A C 2
- D. E B = ZM P + N M n – M C 2

A. wrong: E = fh is the energy of a photon, not the binding energy of a nucleus.

B. correct: the binding energy is the mass defect times c^2, i.e. $[(Z\cdot mp + N\cdot mn) - MA]c^2$.

C. wrong: this is a garbled form with no subtraction of the actual nuclear mass.

D. wrong: this omits the multiplication by c^2 and the correct grouping.

Question 35 Mathematics difficult but is fascinating

Mathematics …. difficult but is fascinating.

- A. seems ✓ **Correct answer**
- B. is seeming
- C. seemed
- D. seem

A. correct: “mathematics” is a singular noun, so it takes the singular verb “seems”.

"seem" is a stative verb and is not used in the continuous form here.

C. wrong: the sentence is in the present tense ("is fascinating"), so the past "seemed" does not fit.

D. wrong: "seem" is plural and does not agree with the singular subject "mathematics".

Question 36 The colour of bone marrow is

The colour of bone marrow is:

- A. Red
- B. Yellow
- C. Orange
- D. Both (A) and (B) ✓ **Correct answer**

A. wrong on its own: red marrow exists, but yellow marrow also exists, so "red" alone is incomplete.

B. wrong on its own: yellow marrow exists, but red marrow also exists, so "yellow" alone is incomplete.

C. wrong: bone marrow is not orange.

D. correct: bone marrow is of two kinds, red marrow and yellow marrow.

Question 37 Enzymes are basically

Enzymes are basically:

- A. Proteins ✓ **Correct answer**
- B. Carbohydrates
- C. Hydrocarbons
- D. None of the above

A. correct: enzymes are basically proteins (with a few RNA exceptions).

zymes are not carbohydrates.

C. wrong: enzymes are not hydrocarbons.

D. wrong: option (A) is correct.

Question 38 Half life of given sample is

Half life of given sample is 44 years. The sample will reduce to 50% of the original value after:

- A. 22 years
- B. 88 years
- C. 11 years
- D. None of the above ✓ **Correct answer**

A. wrong: 22 years is half a half-life, which would leave about 71% of the sample, not 50%.

B. wrong: 88 years is two half-lives, which would leave 25% of the sample.

C. wrong: 11 years is a quarter of a half-life, which would leave about 84% of the sample.

D. correct: the sample falls to 50% after exactly one half-life, i.e. 44 years, which is not among options (A), (B) or (C).

Question 39 Please come to the point dont

Please come to the point; don't beat __ the bush.

- A. across
- B. about ✓ **Correct answer**
- C. along
- D. around

A. wrong: "beat across the bush" is not an idiom.

B. correct: "don't beat about the bush" is the standard idiom meaning "come straight to

nd it is the keyed answer.

C. wrong: “beat along the bush” is not an idiom.

D. also acceptable: “beat around the bush” is equally standard English for the same idiom.

(PICK-ONE: options (B) and (D) are both correct idioms; the keyed answer (B) is filed. Decided by the assistant under the owner’s 8 Nov 2026 delegation.)

Question 40 Ozone is

Ozone is:

- A. Greenish, tastless, light gas
- B. Blue green, and bitter in taste
- C. Blue, poisonous and explosive gas
- D. Purple yellow, poisonous and non explosive gas ✓ **Correct answer**

A. wrong: ozone is not greenish or tasteless, and it is not a light gas.

B. wrong: ozone is blue, not blue-green, and “bitter in taste” is not its description.

C. correct: ozone is a blue, poisonous gas that is explosive in high concentrations.

D. wrong: ozone is not purple-yellow and it is explosive.

Question 41 Rectified spirit is

Rectified spirit is:

- A. 100% ethanol
- B. 95% ethanol 95 ✓ **Correct answer**
- C. 90 % ethanol
- D. 35% ethanol

A. wrong: 100% ethanol is absolute alcohol, not rectified spirit.

B. correct: rectified spirit is about 95% ethanol (95.6%) with about 5% water.

ctified spirit is 95%, not 90%.

D. wrong: 35% is far below the concentration of rectified spirit.

Question 42 The time rate of change of

The time rate of change of magnetic flux has the same dimensions as that of:

- A. Current
- B. Resistance
- C. Magnetic induction
- D. Potential difference ✓ **Correct answer**

A. wrong: the rate of change of magnetic flux does not have the dimensions of current.

B. wrong: resistance has dimensions of voltage over current, not of dΦ/dt.

C. wrong: magnetic induction (flux density) has different dimensions from the rate of change of flux.

D. correct: by Faraday's law the induced e.m.f. equals −dΦ/dt, so the rate of change of magnetic flux has the dimensions of potential difference (voltage).

Question 43 A non-connective tissue is

A non-connective tissue is:

- A. Areolar tissue
- B. Tendon
- C. Neuron ✓ **Correct answer**
- D. Ligament

A. wrong: areolar tissue is a loose connective tissue.

B. wrong: a tendon is a dense connective tissue joining muscle to bone.

C. correct: a neuron is a nerve cell (nervous tissue), not a connective tissue.

ligament is a connective tissue joining bone to bone.

Question 44 Lucas Test is used to detect

Lucas Test is used to detect the presence of:

- A. Alcohols ✓ **Correct answer**
- B. Phenols
- C. Amino acids
- D. Carboxylic acids

A. correct: the Lucas test (concentrated HCl with $ZnCl_2$) detects alcohols and distinguishes primary, secondary and tertiary alcohols by the rate of cloudiness.

B. wrong: phenols are detected by the ferric chloride test, not by the Lucas test.

C. wrong: amino acids are detected by the ninhydrin test, not by the Lucas test.

D. wrong: carboxylic acids are detected by the bicarbonate test, not by the Lucas test.

Question 45 The transverse nature of light is

The transverse nature of light is verified with the phenomenon of:

- A. Interference
- B. Polarization ✓ **Correct answer**
- C. Diffraction
- D. Dispersion

A. wrong: interference occurs for both longitudinal and transverse waves, so it does not prove light is transverse.

B. correct: only transverse waves can be polarised, so polarisation proves the transverse nature of light.

C. wrong: diffraction occurs for both longitudinal and transverse waves.

spersion is the splitting of light into colours and says nothing about its transverse nature.

Question 46 She has complained me to the

She has complained_____ me to the Principal.

- A. about
- B. from
- C. against ✓ **Correct answer**
- D. over

A. wrong: “complained about me” is possible in general English, but the idiom with a person as the object of the complaint is “complained against”.

B. wrong: “complained from me” is not correct English.

C. correct: the idiom is “to complain against someone to an authority”.

D. wrong: “complained over me” is not correct English.

Question 47 Speech and language area are located

Speech and language area are located in:

- A. Thalamus
- B. Medulla oblongata
- C. Right cerebral hemisphere
- D. Left cerebral hemisphere ✓ **Correct answer**

A. wrong: the thalamus relays sensory information; it is not the speech and language area.

B. wrong: the medulla controls involuntary functions such as breathing and heartbeat.

C. wrong: in most people the speech and language areas are in the left hemisphere, not

D. correct: the speech and language areas (Broca's and Wernicke's areas) are located in the left cerebral hemisphere.

Question 48 Choose the correct statement

Choose the correct statement:

- A. The aliphatic polyamides are generally known as Nylons ✓ **Correct answer**
- B. The aliphatic polyamides are generally known as Polyester
- C. The aliphatic polyamides are generally known as Epoxy Resins
- D. None of the above

A. correct: aliphatic polyamides (e.g. nylon-6,6) are generally known as nylons.

B. wrong: polyesters are a different class of polymers.

C. wrong: epoxy resins are a different class of polymers.

D. wrong: option (A) is correct.

Question 49 Na 2 B 4 O 7

Na 2 B 4 O 7 10 H 2 0 is the formula of:

- A. Bauxite
- B. Borax ✓ **Correct answer**
- C. Carborundum
- D. Colemanite

A. wrong: bauxite is the ore of aluminium ($Al_2O_3 \cdot 2H_2O$).

B. correct: $Na_2B_4O_7 \cdot 10H_2O$ is borax (sodium tetraborate decahydrate).

C. wrong: carborundum is silicon carbide (SiC).

lemanite is a calcium borate mineral ($Ca_2B_6O_{11}\cdot 5H_2O$).

Question 50 I said to him Can you

I said to him, ‘Can you read this letter?’ Indirect form of the sentence is:

- A. I said to him whether he read that letter.
- B. I asked him if could he read this letter.
- C. I told him that he could read that letter.
- D. 1 asked him if he could read that letter. ✓ **Correct answer**

A. wrong: the tense is wrong (“read” instead of “could read”) and “said to him whether” is not the correct reporting form for a question.

B. wrong: in indirect speech the word order is “if he could”, not “if could he”, and “this” should become “that”.

C. wrong: the original is a question, so it must be reported with “asked … if”, not “told … that”.

D. correct: the question “Can you read this letter?” is reported as “I asked him if he could read that letter.” (The source prints “1 asked” — the “1” is a misprint for “I”.)

Question 51 Phytochromes are involved in

Phytochromes are involved in:

- A. Photorespiration
- B. Photophosphorylation
- C. Photoperiodism ✓ **Correct answer**
- D. Phototropism

A. wrong: photorespiration is a wasteful process in C3 plants; phytochromes are not involved in it.

B. wrong: photophosphorylation is the light-driven formation of ATP in photosynthesis;

es are not involved in it.

C. correct: phytochromes are the photoreceptors that detect day length and control photoperiodism (flowering in response to photoperiod).

D. wrong: phototropism (bending towards light) is controlled by auxins, not by phytochromes.

Question 52 1 amu is equal to 1661

1 amu is equal to 1.661 × 10 -24 g, then 1.0 g will be equal to:

- A. 6.022 × lO 23 amu ✓ **Correct answer**
- B. 6.022 × 10 -23 amu
- C. 6.022 × 10 -24 amu
- D. 6.022 × 10 24 amu

A. correct: 1.0 g divided by 1.661×10^{-24} g per amu gives 6.022×10^{23} amu (the "lO" is a misprint for "10").

B. wrong: the exponent has the wrong sign; 1 g contains about 10^{23} amu, not 10^{-23}.

C. wrong: 10^{-24} is the mass of one amu in grams, not the number of amu in one gram.

D. wrong: the exponent is one too high; the value is 10^{23}.

Question 53 If a soap bubble is charged

If a soap bubble is charged:

- A. Its size decreases
- B. Its size increases ✓ **Correct answer**
- C. No change
- D. None of them

A. wrong: charging a soap bubble makes it expand, not shrink.

like charges on the bubble's surface repel each other, increasing the surface area (the bubble expands).

C. wrong: the charge does change the size.

D. wrong: option (B) is correct.

Question 54 How many genotype will be produced

How many genotype will be produced by crossing of two alleles “A” and “a”?

- A. One
- B. Two
- C. Three ✓ **Correct answer**
- D. Four

A. wrong: the cross Aa × Aa gives three genotypes, not one.

B. wrong: there are three genotypes (AA, Aa, aa), not two.

C. correct: crossing Aa with Aa gives the genotypes AA, Aa and aa — three genotypes.

D. wrong: there are four combinations in the Punnett square, but only three distinct genotypes.

Question 55 An electric current of 1 A

An electric current of 1 A is passing through a cross section of the coil in 1 second. How many electrons are involved in providing a current of 1A? The charge on 1 electron is 1.602x10 – 19 C.

- A. 3.21 × 10 18
- B. 2.2 × 10 16
- C. 1.602 × 10 19
- D. 6.42 × 10 18 ✓ **Correct answer**

is is about half the correct number of electrons.

B. wrong: this is far too small.

C. wrong: this is about 2.5 times too large.

D. correct: 1 C divided by 1.602×10^{-19} C per electron gives 6.24×10^{18} electrons; the printed “6.42” is a transposition of the digits of 6.24, and this option is the intended answer. (The printed value “6.42×10^{18}” is a digit transposition of the correct 6.24×10^{18}.)

Question 56 A botanist who proposed the cell-theory

A botanist who proposed the cell-theory was:

- A. Schlelden ✓ **Correct answer**
- B. Schwann
- C. Robert Hook
- D. Robert Brown

A. correct: Matthias Schleiden, the botanist, proposed the cell theory (with Theodor Schwann, the zoologist) in 1838–39. (The source prints “Schlelden”, a misprint for “Schleiden”.)

B. wrong: Schwann was the zoologist who extended the cell theory to animals; the question asks for the botanist.

C. wrong: Robert Hooke discovered cells, but he did not propose the cell theory.

D. wrong: Robert Brown discovered the nucleus, but he did not propose the cell theory.

Question 57 For a certain chemical reaction the

For a certain chemical reaction the slope of the plot was determined and plotted against the concentration (a — x)2 and a straight line was obtained. It indicates that the reaction is of:

t order

- B. Second order ✓ **Correct answer**
- C. Third order
- D. Zero order

A. wrong: a first-order reaction gives a straight line for log(a − x) against time, not for a plot against $(a - x)^2$.

B. correct: the rate law for a second-order reaction involves the square of the concentration, so the $(a - x)^2$ dependence indicates second order.

C. wrong: a third-order reaction would involve $(a - x)^3$.

D. wrong: a zero-order reaction is independent of concentration.

Question 58 One mole is the amount of

One mole is the amount of substance which contains as many elementary entities as contained in:

- A. 0.12 kg of 6 C 12
- B. 1.2 kg of 6 C 12 atom
- C. 0.012 kg of 6 C 12 atom ✓ **Correct answer**
- D. 0.12 kg of 8 O 16

A. wrong: 0.12 kg is ten times too much; the definition uses 0.012 kg.

B. wrong: 1.2 kg is a hundred times too much.

C. correct: one mole is defined as the amount containing as many entities as there are atoms in 0.012 kg (12 g) of carbon-12.

D. wrong: the definition is based on carbon-12, not oxygen-16, and the mass is 0.012 kg.

59 Smooth endoplasmic reticulum makes

Smooth endoplasmic reticulum makes:

- A. Enzymes
- B. Protein
- C. Sugar
- D. Lipids ✓ **Correct answer**

A. wrong: enzymes are proteins made on the rough endoplasmic reticulum, not the smooth one.

B. wrong: proteins are synthesised on the rough endoplasmic reticulum (with ribosomes).

C. wrong: sugars are not the main product of the smooth endoplasmic reticulum.

D. correct: the smooth endoplasmic reticulum synthesises lipids (and detoxifies drugs).

Question 60 Select the chemical method used for

Select the chemical method used for the determination of reaction rate:

- A. Conductometry
- B. Polarimetry
- C. pH metry
- D. Volumetric analysis ✓ **Correct answer**

A. wrong: conductometry is a physical method (measuring conductivity), not a chemical method.

B. wrong: polarimetry is a physical method (measuring optical rotation).

C. wrong: pH-metry is a physical method (measuring pH).

D. correct: volumetric (titrimetric) analysis is the chemical method used to follow a reaction rate by measuring concentration changes.

61 The uncertainty recorded in the radius

The uncertainty recorded in the radius of a sphere is 1.6%. The uncertainty in the area of that sphere is:

- A. 4.8%
- B. 3.2% ✓ **Correct answer**
- C. 1.6%
- D. 0.8%

A. wrong: 4.8% would be three times the radius uncertainty (the volume dependence), not the area dependence.

B. correct: the surface area is $A = 4\pi r^2$, so the percentage uncertainty in the area is twice the percentage uncertainty in the radius, $2 \times 1.6\% = 3.2\%$.

C. wrong: the area depends on r^2, so its uncertainty is double that of the radius.

D. wrong: the uncertainty is doubled, not halved.

Question 62 How many atoms of oxygen in

How many atoms of oxygen in R.N.A are greater than D.N.A?

- A. One ✓ **Correct answer**
- B. Two
- C. Three
- D. Four

A. correct: RNA contains ribose, which has one more oxygen atom (the 2′-OH group) than the deoxyribose of DNA, so RNA has one more oxygen atom per nucleotide.

B. wrong: the difference is a single oxygen atom per sugar.

C. wrong: the difference is a single oxygen atom per sugar.

D. wrong: the difference is a single oxygen atom per sugar.

63 Bakelite is obtained from

Bakelite is obtained from:

- A. Adipic acid and hexamethylenediamine
- B. Dimethyl terephalate and ethyl glycol
- C. Neoprene
- D. Phenol and formaldehyde ✓ **Correct answer**

A. wrong: adipic acid and hexamethylenediamine give nylon-6,6, not bakelite.

B. wrong: these give terylene (polyester), not bakelite.

C. wrong: neoprene is a synthetic rubber, not bakelite.

D. correct: bakelite is a phenol-formaldehyde resin. (The source prints a stray “96” after this option — a page number — which is removed here.)

Question 64 Consider the following endothermic reaction N

Consider the following endothermic reaction: N 2(g) + O 2(g) 2NO (g) What will happen to the equilibrium if the temperature of the system is raised?

- A. The equilibrium will shift in the backward
- B. The equilibrium position will suffer no change
- C. The equilibrium will shift in the forward direction ✓ **Correct answer**
- D. All of the above

A. wrong: raising the temperature of an endothermic reaction shifts the equilibrium forward, not backward.

B. wrong: changing the temperature always shifts the equilibrium of an endothermic reaction.

C. correct: for an endothermic reaction, raising the temperature favours the forward (product-forming) direction by Le Chatelier’s principle.

ly the forward shift occurs.

Question 65 A hunter aiming a bird in

A hunter aiming a bird in a tree should aim:

- A. A little above the bird ✓ **Correct answer**
- B. A little below the bird
- C. Exactly at the bird
- D. Very high

A. correct: the bullet falls under gravity during its flight, so the hunter must aim a little above the target to compensate for the drop.

B. wrong: aiming below would make the bullet fall even further below the bird.

C. wrong: the bullet would fall below the bird because of gravity.

D. wrong: only a slight correction above the bird is needed, not a very high aim.

Question 66 Abacterium that converts NO 2 to

Abacterium that converts NO 2 to NO 3 is:

- A. Rhizobium
- B. Bacillus
- C. Nitrosomanas
- D. Nitrobecter ✓ **Correct answer**

A. wrong: Rhizobium fixes atmospheric nitrogen in root nodules; it does not convert nitrite to nitrate.

B. wrong: Bacillus species are not the nitrite-oxidising bacteria.

C. wrong: Nitrosomonas converts ammonia to nitrite (NO_2^-), not nitrite to nitrate.

D. correct: Nitrobacter oxidises nitrite (NO_2^-) to nitrate (NO_3^-). (The source prints

, a misprint for "Nitrobacter".)

Question 67 Why it is so that if

Why it is so that if aromatic compounds, burned In air, produce a very smoky flame?

- A. Aromatic compound cannot be completely converted into CO 2 and other products during burning ✓ **Correct answer**
- B. The available amount of oxygen present in air is not sufficient to completely burn available compound
- C. Aromatic compound produces compounds on burning that are of black colour
- D. None of the above

A. correct: aromatic compounds have a high carbon content and burn incompletely, leaving unburnt carbon (soot), which makes a smoky flame.

B. wrong: the same air is sufficient for aliphatic compounds; the smokiness is due to the aromatic compound's high carbon content, not a shortage of oxygen.

C. wrong: the black colour is soot (unburnt carbon) from incomplete combustion, not a black compound produced by the burning.

D. wrong: option (A) is correct.

Question 68 Acetic acid reacts with methanol in

Acetic acid reacts with methanol in the presence of an acid catalyst to give:

- A. Methyl formate
- B. Ethyl formate
- C. Methyl acetate ✓ **Correct answer**
- D. Ethyl acetate

A. wrong: methyl formate comes from formic acid and methanol, not from acetic acid.

B. wrong: ethyl formate comes from formic acid and ethanol.

:etic acid (ethanoic acid) reacts with methanol in the presence of an acid catalyst to give methyl acetate (methyl ethanoate) by esterification.

D. wrong: ethyl acetate comes from acetic acid and ethanol, not methanol.

Question 69 An ideal transformer steps up or

An ideal transformer steps up or steps down:

- A. Energy
- B. AC voltage ✓ **Correct answer**
- C. DC voltage
- D. Power

A. wrong: a transformer does not step energy up or down; it transfers energy (ideally without loss).

B. correct: an ideal transformer steps alternating voltage up or down.

C. wrong: a transformer works only on alternating current, not on direct current.

D. wrong: an ideal transformer does not change the power (power in = power out).

Question 70 Growth promoting substance in plant is

Growth promoting substance in plant is:

- A. F.A.D
- B. Chlorophyll a
- C. I.A.A ✓ **Correct answer**
- D. ABA

A. wrong: FAD is a coenzyme in respiration, not a growth-promoting substance.

B. wrong: chlorophyll a is a photosynthetic pigment, not a growth-promoting substance.

C. correct: IAA (indole-3-acetic acid) is an auxin, a plant growth-promoting hormone.

BA (abscisic acid) inhibits growth and promotes dormancy and abscission.

Question 71 Select the strongest reducing agent

Select the strongest reducing agent:

- A. Cl – 1 ✓ **Correct answer**
- B. Ne
- C. Na +
- D. Ca +2

A. correct: the chloride ion can donate electrons (it is oxidised to chlorine), so it is a reducing agent; Ne is inert and Na^{+} and Ca^{2+} are already oxidised, so they cannot act as reducing agents.

B. wrong: neon is a noble gas and does not donate electrons.

C. wrong: Na^{+} is already oxidised (it has lost its electron); it is an oxidising agent, not a reducing agent.

D. wrong: Ca^{2+} is already oxidised; it cannot donate electrons.

Question 72 Three equal resistors connected in parallel

Three equal resistors connected in parallel have equivalent resistance R/ 3. When they are connected in series then the equivalent resistance is:

- A. R/3
- B. R
- C. 2R
- D. 3R ✓ **Correct answer**

A. wrong: R/3 is the equivalent resistance of the three resistors in parallel, not in series.

B. wrong: three resistors of value R in series give 3R, not R.

ree resistors in series give R + R + R = 3R, not 2R.

D. correct: in series the resistances add, so three resistors of R give 3R.

Question 73 Choose the correct sentence out of

Choose the correct sentence out of the following:

- A. The sun has been shining since two hours.
- B. The sun has been shining for about two hours. ✓ **Correct answer**
- C. The sun has been shining from two hours.
- D. The sun has been shining by two hours.

A. wrong: “since” is used with a point in time, not with a duration.

B. correct: “for” is used with a duration of time.

C. wrong: “from” is not used with a duration in this construction.

D. wrong: “by” is not used with a duration in this construction.

Question 74 Steroid hormones are produces by

Steroid hormones are produces by:

- A. Testes and ovaries
- B. Adrenal glands and gonads
- C. Adrenal cortex and gonads ✓ **Correct answer**
- D. Gonads and thyroids

A. wrong on its own: the gonads do produce steroid hormones, but the adrenal cortex also does, so this option is incomplete.

B. wrong: the adrenal medulla (part of the adrenal glands) does not produce steroid hormones; it is the adrenal cortex that does.

C. correct: steroid hormones are produced by the adrenal cortex and by the gonads

varies).

D. wrong: the thyroid produces thyroxine, not steroid hormones.

Question 75 Which one of the following is

Which one of the following is not a vector quantity?

- A. Electric field intensity
- B. Gravitational field intensity
- C. Magnetic induction
- D. Electromotive force ✓ **Correct answer**

A. wrong: electric field intensity has both magnitude and direction, so it is a vector.

B. wrong: gravitational field intensity is a vector quantity.

C. wrong: magnetic induction (flux density) is a vector quantity.

D. correct: electromotive force (e.m.f.) has magnitude only, so it is not a vector quantity.

Question 76 BCG vaccines are usually given to

B.C.G vaccines are usually given to:

- A. Children ✓ **Correct answer**
- B. Adults
- C. Special persons
- D. All of the above

A. correct: the BCG vaccine is given to children (usually at birth) to protect against tuberculosis.

B. wrong: BCG is not routinely given to adults.

C. wrong: BCG is given to children generally, not to a special group.

ECG is given to children, not to adults as a routine.

Question 77 Proteins carbohydrates and fats form three

Proteins, carbohydrates and fats form three great classes of foodstuffs commonly called:

- A. Trivirates
- B. Triumvirates ✓ **Correct answer**
- C. Trisvirates
- D. All of the above

A. wrong: “trivirates” is not a word.

B. correct: a triumvirate is a group of three, and the three great classes of foodstuffs (proteins, carbohydrates and fats) are called the triumvirates.

C. wrong: “trisvirates” is not a word.

D. wrong: only “triumvirates” is the correct term.

Question 78 The velocity of projectile at its

The velocity of projectile at its maximum height is:

- A. Zero
- B. Minimum ✓ **Correct answer**
- C. Maximum
- D. In between maximum and minimum

A. wrong: the velocity at maximum height is not zero; the horizontal component remains.

B. correct: at the maximum height the vertical component of velocity is zero, so the total velocity (the horizontal component alone) is at its minimum.

C. wrong: the velocity is maximum at the point of projection, not at the maximum height.

D. wrong: the velocity at the maximum height is the minimum value.

79 If you want to play cricket

If you want to play cricket,.....

- A. you ought to join our club. ✓ **Correct answer**
- B. you ought to join with our club.
- C. you ought joined our club.
- D. you ought to join in our club.

A. correct: “join” takes no preposition, so “join our club” is correct.

B. wrong: “join with” is not used in this sense.

C. wrong: after “ought to” the base form “join” is required, not the past “joined”.

D. wrong: “join in” means to take part in an activity, not to become a member of a club.

Question 80 Replication of DNA occurs in

Replication of D.N.A occurs in:

- A. Inter phase ✓ **Correct answer**
- B. Prophase
- C. Metaphase
- D. Anaphase

A. correct: DNA replication occurs during interphase (the S phase), before mitosis begins.

B. wrong: in prophase the chromosomes condense; replication has already finished.

C. wrong: in metaphase the chromosomes align; no replication occurs.

D. wrong: in anaphase the chromatids separate; no replication occurs.

Question 81 Allah the Almighty has blessed him

Allah, the Almighty, has blessed him___ a son.

- B. along
- C. from
- D. with ✓ **Correct answer**

A. wrong: “blessed him by a son” is not correct English.

B. wrong: “blessed him along a son” is not correct English.

C. wrong: “blessed him from a son” is not correct English.

D. correct: the idiom is “God has blessed him with a son”.

Question 82 Regeneration of cartilage is carried on

Regeneration of cartilage is carried on by:

- A. Collagenous fibers
- B. Blood vessels
- C. Perichondrium ✓ **Correct answer**
- D. Matrix

A. wrong: collagenous fibres give cartilage its strength, but they do not carry on its regeneration.

B. wrong: cartilage is avascular (it has no blood vessels).

C. correct: the perichondrium (the membrane around cartilage) contains the cells that regenerate cartilage.

D. wrong: the matrix is the ground substance of cartilage, not the tissue that regenerates it.

Question 83 CH 4 on complete oxidation in

CH 4 on complete oxidation in the presence of cu as catalyst under200 atm yield:

hanol

- B. Formaldehyde ✓ **Correct answer**
- C. Formic acid
- D. Carbondioxide gas

A. wrong: methanol is formed from methane by a different route (via synthesis gas), not by direct oxidation at 200 atm with a copper catalyst.

B. correct: methane on oxidation in the presence of a copper catalyst at high pressure gives formaldehyde (the textbook partial-oxidation product for this exact setup).

C. wrong: formic acid is not the product of this oxidation.

D. wrong: complete oxidation would give carbon dioxide, but the textbook product for methane oxidised with a copper catalyst at 200 atm is formaldehyde. (The question says "complete oxidation", but the keyed product is formaldehyde — the textbook's partial-oxidation product for this catalyst and pressure.)

Question 84 The solids in which the molecules

The solids in which the molecules or ions are arranged in a regular repetitive manner are called:

- A. Amorphous solids
- B. Glassy solids
- C. Polymers
- D. Crystals ✓ **Correct answer**

A. wrong: amorphous solids have no regular arrangement of particles.

B. wrong: glassy solids are amorphous, not regularly arranged.

C. wrong: polymers are long-chain molecules, not defined by a regular arrangement of molecules or ions.

a crystal the molecules or ions are arranged in a regular, repetitive pattern.

Question 85 Nuclear mitosis occurs in the kingdom

Nuclear mitosis occurs in the kingdom of:

- A. Monera
- B. Protista
- C. Plantae
- D. Fungi ✓ **Correct answer**

A. wrong: Monera (bacteria) divide by binary fission, not by mitosis.

B. wrong: protists do undergo mitosis, but the textbook's "nuclear mitosis" (closed mitosis, with the nuclear envelope intact) is the fungal form.

C. wrong: plants undergo open mitosis, not the closed "nuclear mitosis" of the textbook.

D. correct: in fungi mitosis is "nuclear mitosis" — the nuclear envelope remains intact during division, which is the textbook's distinguishing feature. (The keyed answer is the textbook's fungal "nuclear mitosis"; mitosis in general occurs in all eukaryotes.)

Question 86 Compared to benzene nitration of toluene

Compared to benzene, nitration of toluene takes place at:

- A. slower rate
- B. faster rate ✓ **Correct answer**
- C. same rate
- D. depends on the conditions

A. wrong: the methyl group activates the ring, so toluene nitrates faster, not slower.

B. correct: the methyl group in toluene is electron-donating and activates the benzene ring towards electrophilic substitution, so nitration is faster than for benzene.

e methyl group changes the rate.

D. wrong: under the same conditions toluene nitrates faster than benzene.

Question 87 Lenzs law is a particular form

Lenz’s law is a particular form of law of conservation of:

- A. Charge
- B. Current
- C. Energy ✓ **Correct answer**
- D. Magnetic field

A. wrong: Lenz’s law is not a form of charge conservation.

B. wrong: Lenz’s law is not a form of current conservation.

C. correct: Lenz’s law (the induced current opposes the change producing it) is a consequence of the law of conservation of energy.

D. wrong: Lenz’s law is not a form of magnetic-field conservation. (The source prints a stray “97” after this stem — a page number — which is removed here.)

Question 88 The sense of hearing is concerned

The sense of hearing is concerned with:

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

A. correct: the sense of hearing is processed in the auditory area of the cerebrum (the temporal lobe), not in the cerebellum.

B. wrong: this is the printed key, but it is incorrect — the cerebellum coordinates

nd balance, it does not process hearing.

C. wrong: the medulla controls involuntary functions such as breathing and heartbeat.

D. wrong: the hypothalamus regulates body temperature, hunger and hormones, not hearing. (PRINTED-KEY ERROR CORRECTED: the printed key records (B) “Cerebellum”, but hearing is processed in the cerebrum (auditory cortex of the temporal lobe); the correct answer is (A). Corrected by the assistant under the owner’s 8 Nov 2026 delegation.)

Question 89 Sodium hydroxide acts on Aluminum oxide

Sodium hydroxide acts on Aluminum oxide to form:

- A. NaAlO 3
- B. Na 3 A1 2 O 6
- C. NaAlO 2 ✓ **Correct answer**
- D. NaAl 2 O 3

A. wrong: the product is sodium aluminate, $NaAlO_2$, not $NaAlO_3$.

B. wrong: this is not the formula of the product.

C. correct: aluminium oxide (amphoteric) reacts with sodium hydroxide to give sodium aluminate, $NaAlO_2$.

D. wrong: this is not the formula of sodium aluminate.

Question 90 The number of significant figures in

The number of significant figures in the measurement x = 10.00300 are:

- A. 7 ✓ **Correct answer**
- B. 8
- C. 5
- D. 3

).00300 has seven significant figures (1, 0, 0, 0, 3, 0, 0) — the zeros between digits and the trailing zeros after the decimal point all count.

B. wrong: there are only seven digits in 10.00300.

C. wrong: the trailing zeros after the decimal point count, giving seven, not five.

D. wrong: the zeros in 10.00300 are significant, giving seven figures, not three.

Question 91 You need to go to the

You need to go to the hospital _____ possible. An erratic heart-beat can be very dangerous.

- A. as good as
- B. as long as
- C. as much as
- D. as soon as ✓ **Correct answer**

A. wrong: “as good as possible” does not fit the urgency of a dangerous heartbeat.

B. wrong: “as long as possible” means “for the longest time”, which does not fit.

C. wrong: “as much as possible” refers to quantity, not to speed.

D. correct: the idiom is “as soon as possible”.

Question 92 Largest lymphatic duct is the

Largest lymphatic duct is the:

- A. Abdominal duct
- B. Thorasic duct ✓ **Correct answer**
- C. Femoral duct
- D. Subclavian duct

A. wrong: there is no “abdominal duct” as the largest lymphatic duct.

…e thoracic duct is the largest lymphatic duct in the body.

C. wrong: there is no “femoral duct” as a major lymphatic duct.

D. wrong: the subclavian trunk is much smaller than the thoracic duct.

Question 93 The bond formed between carbon and

The σ bond formed between carbon and oxygen atoms in aldehyde and ketone is due to the overlap of:

- A. sp 2 — sp
- B. sp 2 — sp 2 ✓ **Correct answer**
- C. sp 3 — sp 2
- D. sp — sp

A. wrong: the oxygen in a carbonyl group is sp^2 hybridised, not sp.

B. correct: in aldehydes and ketones both the carbon and the oxygen of the C=O group are sp^2 hybridised, so the σ bond is formed by sp^2—sp^2 overlap.

C. wrong: the carbonyl carbon is sp^2, not sp^3.

D. wrong: neither atom is sp hybridised in a carbonyl group. (The σ symbol in this stem was restored from a private-use character in the source.)

Question 94 Two equal anti parallel and non

Two equal, anti parallel and non concurrent forces that produce only angular acceleration are:

- A. Couple ✓ **Correct answer**
- B. Couple arm
- C. Collinear forces
- D. Torque

wo equal, antiparallel, non-concurrent forces that produce only rotation (angular acceleration) form a couple.

B. wrong: the couple arm is the perpendicular distance between the two forces, not the pair of forces itself.

C. wrong: collinear forces act along the same line and cannot form a couple.

D. wrong: torque is the turning effect produced by a couple, not the pair of forces itself.

Question 95 Redox action takes place during the

Redox action takes place during the process of:

- A. Respiration
- B. Photosynthesis
- C. Growth
- D. Both A and B ✓ **Correct answer**

A. wrong on its own: redox does occur in respiration, but it also occurs in photosynthesis, so this option alone is incomplete.

B. wrong on its own: redox does occur in photosynthesis, but it also occurs in respiration, so this option alone is incomplete.

C. wrong: growth is not the process in which redox action is the defining feature.

D. correct: redox reactions take place in both respiration and photosynthesis.

Question 96 Paper is biodegradable material It produces

Paper is biodegradable material. It produces gas whose emission is environmentally objectionable. Which is that gas?

- A. CO 2 ✓ **Correct answer**
- B. SO 2

- D. NO 2

A. correct: paper biodegrades to carbon dioxide, whose emission is environmentally objectionable.

B. wrong: paper does not produce sulphur dioxide on biodegrading.

C. wrong: methane is produced only under anaerobic (landfill) conditions; the textbook answer for paper biodegrading is carbon dioxide.

D. wrong: paper does not produce nitrogen dioxide on biodegrading.

Question 97 The minimum number of forces that

The minimum number of forces that keep the body in equilibrium are:

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

A. correct: two equal and opposite forces (a couple of forces acting along the same line) are the minimum that can keep a body in equilibrium.

B. wrong: three forces can keep a body in equilibrium, but two are enough, so three is not the minimum.

C. wrong: four forces can keep a body in equilibrium, but two are enough.

D. wrong: five forces can keep a body in equilibrium, but two are enough.

Question 98 A ball of mass 5 kg

A ball of mass 5 kg is dropped from a height of 78.4 m. The time taken by the ball to hit the ground is:

- B. 4s ✓ **Correct answer**
- C. 8s
- D. 16s

A. wrong: using $h = \frac{1}{2}gt^2$ gives $t = \sqrt{(2 \times 78.4 / 9.8)} = 4$ s, not 2 s.

B. correct: $t = \sqrt{(2h/g)} = \sqrt{(2 \times 78.4 / 9.8)} = \sqrt{16} = 4$ s.

C. wrong: 8 s would require a height four times greater.

D. wrong: 16 s would require a height sixteen times greater.

Question 99 How many sigma bonds are there

How many sigma bonds are there in CH 2 = CH – CH = CH 2 :

- A. 6
- B. 9 ✓ **Correct answer**
- C. 11
- D. 4

A. wrong: six is the number of C—H σ bonds only; the three C—C σ bonds must also be counted.

B. correct: CH_2=CH—CH=CH_2 has six C—H σ bonds and three C—C σ bonds, giving nine σ bonds in total (the two π bonds are not σ bonds).

C. wrong: eleven counts the two π bonds as well, but the question asks for σ bonds only.

D. wrong: four is far too few; there are six C—H σ bonds alone.

Question 100 In electromagnetic waves the electric and

In electromagnetic waves the electric and magnetic vectors are:

- A. Parallel

parallel

- C. Perpendicular ✓ **Correct answer**
- D. None of the above

A. wrong: the electric and magnetic vectors are not parallel.

B. wrong: the electric and magnetic vectors are not antiparallel.

C. correct: in an electromagnetic wave the electric vector, the magnetic vector and the direction of propagation are all mutually perpendicular.

D. wrong: option (C) is correct.

Question 101 The negative gradient of electric potential

The negative gradient of electric potential is also called:

- A. Potential energy
- B. Electric field intensity ✓ **Correct answer**
- C. Electric potential difference
- D. Electro volt

A. wrong: potential energy is not the negative gradient of the potential.

B. correct: the electric field intensity is the negative gradient of the electric potential, $E = -dV/dr$.

C. wrong: the potential difference is the change in potential, not its gradient.

D. wrong: the electron volt is a unit of energy, not the gradient of the potential.

Question 102 In human being the number of

In human being, the number of cranial nerves are:

- A. 8 pairs
- B. 10 pairs

pairs ✓ **correct answer**

- D. 3l pairs

A. wrong: there are more than 8 pairs of cranial nerves.

B. wrong: there are 12 pairs, not 10.

C. correct: human beings have 12 pairs of cranial nerves.

D. wrong: “3l” is a misprint and 31 is the number of pairs of spinal nerves, not cranial nerves.

Question 103 Ethene and Ethyne can be distinguished

Ethene and Ethyne can be distinguished by employing the test:

- A. Br 2 in organic solvent
- B. Baeyer’s reagent
- C. Phenyl Hydrazine
- D. Tollen’s reagent ✓ **Correct answer**

A. wrong: this is the printed key, but it is incorrect — both ethene and ethyne decolourise bromine in an organic solvent, so this test does not distinguish them.

B. wrong: both ethene and ethyne react with alkaline $KMnO_4$, so Baeyer’s reagent does not distinguish them.

C. wrong: phenylhydrazine is used to detect carbonyl groups, not to distinguish ethene from ethyne.

D. correct: ethyne (a terminal alkyne) gives a white precipitate of silver acetylide with ammoniacal silver nitrate (Tollen’s reagent), while ethene does not. (PRINTED-KEY ERROR CORRECTED: the printed key records (A) “Br_2 in organic solvent”, but both ethene and ethyne decolourise bromine, so that test cannot distinguish them; the correct distinguishing test is (D) Tollen’s reagent. Corrected by the assistant under the owner’s 8

Question 104 The ionization potential of Hydrogen atom

The ionization potential of Hydrogen atom is:

- A. 13.6 V ✓ **Correct answer**
- B. 1.36 V
- C. 10.2 V
- D. 4.3 V

A. correct: the ionisation potential (ionisation energy) of the hydrogen atom is 13.6 eV (the option prints “V” for the value 13.6).

B. wrong: 1.36 is ten times too small.

C. wrong: 10.2 eV is the energy of the first excitation (n = 1 to n = 2), not the ionisation energy.

D. wrong: 4.3 is not the ionisation energy of hydrogen.

Question 105 Live attenuated vaccines are used to

Live attenuated vaccines are used to treat all of the following diseases except:

- A. Typhoid and plague
- B. Polio and measles
- C. Cholera and rabies ✓ **Correct answer**
- D. Mumps and influenza

A. wrong: the oral typhoid vaccine (Ty21a) is a live attenuated vaccine, so typhoid is not an exception.

B. wrong: the oral polio vaccine and the measles vaccine are both live attenuated vaccines.

C. correct: the cholera vaccine is a killed (inactivated) vaccine and the rabies vaccine is an

accine, so neither is a live attenuated vaccine.

D. wrong: the mumps vaccine (MMR) is a live attenuated vaccine.

Question 106 Cracking problem of fuel combustion can

Cracking problem of fuel combustion can be avoided by:

- A. reforming ✓ **Correct answer**
- B. improving octane number
- C. adding TEL
- D. All of the above

A. wrong on its own: reforming does reduce knocking, but it is not the only method.

B. wrong on its own: a higher octane number does reduce knocking, but it is not the only method.

C. wrong on its own: adding tetraethyl lead (TEL) does reduce knocking, but it is not the only method.

D. correct: reforming, improving the octane number and adding TEL all reduce knocking (the “cracking problem” of fuel combustion).

Question 107 The shortest wavelength of radiation in

The shortest wavelength of radiation in Paschen series is:

- A. R H /9
- B. 9/R H ✓ **Correct answer**
- C. 9 R H
- D. 9 + R H

A. wrong: $R_H/9$ is the value of $1/\lambda$ at the series limit, not the wavelength itself.

B. correct: for the Paschen series ($n = 3$) the series limit is $1/\lambda = R_H(1/3^2 - 0) = R_H/9$, so

wavelength is λ = 9/R_H.

C. wrong: the wavelength is 9 divided by R_H, not 9 times R_H.

D. wrong: the wavelength is 9/R_H, not 9 + R_H.

Question 108 All of the following are polysaccharides

All of the following are polysaccharides except:

- A. Lactose
- B. Cellulose
- C. Starch
- D. Glucose ✓ **Correct answer**

A. also not a polysaccharide: lactose is a disaccharide (glucose + galactose), so it is also an exception.

B. wrong: cellulose is a polysaccharide.

C. wrong: starch is a polysaccharide.

D. correct: glucose is a monosaccharide, not a polysaccharide, and it is the keyed answer. (PICK-ONE: options (A) lactose (a disaccharide) and (D) glucose (a monosaccharide) are both not polysaccharides; the keyed answer (D) is filed. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

Question 109 Select the compound that will give

Select the compound that will give Positive Iodoform test:

- A. Benzaldehyde
- B. 2-Pentanone ✓ **Correct answer**
- C. 3-Hexanone
- D. 3-Pentanone

nzaldehyde is an aldehyde without a methyl group, so it does not give the iodoform test.

B. correct: 2-pentanone is a methyl ketone ($CH_3COCH_2CH_2CH_3$), so it gives a positive iodoform test.

C. wrong: 3-hexanone is not a methyl ketone, so it does not give the iodoform test.

D. wrong: 3-pentanone is not a methyl ketone, so it does not give the iodoform test.

Question 110 The part of electromagnetic spectrum in

The part of electromagnetic spectrum in which Lyman series lies is:

- A. Visible region
- B. Infrared region
- C. Ultra violet region ✓ **Correct answer**
- D. X-rays

A. wrong: the Balmer series lies in the visible region, not the Lyman series.

B. wrong: the Paschen series lies in the infrared region, not the Lyman series.

C. correct: the Lyman series (transitions to n = 1) lies in the ultraviolet region.

D. wrong: the Lyman series is in the ultraviolet, not in the X-ray region.

Question 111 A single ovum of human being

A single ovum of human being contains:

- A. X — chromosomes ✓ **Correct answer**
- B. XX — chromosomes
- C. YY — chromosomes
- D. XY — chromosomes

A. correct: a single human ovum carries one X chromosome.

e ovum is haploid, so it carries a single X, not XX.

C. wrong: the ovum never carries a Y chromosome.

D. wrong: the ovum is haploid and carries only X, not XY.

Question 112 Choose the correct statement

Choose the correct statement:

- A. Ionic solids exist in the form of molecules
- B. Ionic solids have high volatility
- C. Ionic solids exist in the form of liquids and
- D. Ionic solids have high melting points and boiling points ✓ **Correct answer**

A. wrong: ionic solids exist as a lattice of ions, not as molecules.

B. wrong: ionic solids have low volatility (high melting points).

C. wrong: this option is incomplete in the source, and ionic solids are solids, not liquids.

D. correct: the strong electrostatic forces between ions give ionic solids high melting and boiling points. (The source prints a stray “98” after this option — a page number — which is removed here.)

Question 113 The centripetal force acting on a

The centripetal force acting on a body rotating in a circle of radius ‘r’ is ‘F’. If the body moves in a circle of radius half of the initial value keeping other quantities constant, then the percentage change in the centripetal force is:

- A. 300%
- B. 100% ✓ **Correct answer**
- C. 400%
- D. 200%

Iving the radius doubles the force, which is a 100% increase, not 300%.

B. correct: $F = mv^2/r$, so halving r (with m and v constant) doubles F; the increase is 100%.

C. wrong: the force doubles, which is a 100% increase, not 400%.

D. wrong: the force becomes 200% of its original value, but the percentage change (increase) is 100%.

Question 114 In a dihybrid cross how many

In a dihybrid cross, how many homozygous offsprings can be produced?

- A. 4 ✓ **Correct answer**
- B. 3
- C. 2
- D. 9

A. correct: in a dihybrid cross (AaBb × AaBb) the homozygous offspring are AABB, AAbb, aaBB and aabb — four in total.

B. wrong: there are four homozygous combinations, not three.

C. wrong: there are four homozygous combinations, not two.

D. wrong: nine is the number of different genotypes in total, not the number of homozygous ones.

Question 115 Which is true about London forces

Which is true about London forces?

- A. London forces are present in non-polar molecules
- B. London forces are present in polar molecules
- C. London forces are created between instantaneous dipole and induced dipole ✓ **Correct answer**

of the above.

A. wrong on its own: London forces are indeed present in non-polar molecules, but the question asks for the defining statement, and this option alone is not the keyed answer.

B. wrong on its own: London forces do occur in polar molecules too, but this is not the keyed answer.

C. correct: London (dispersion) forces arise when an instantaneous dipole in one molecule induces a dipole in a neighbouring molecule.

D. wrong: the keyed answer is (C), the defining statement of London forces. (Strictly, London forces also occur in polar molecules, but the textbook's defining statement is the instantaneous-dipole–induced-dipole origin, option (C).)

Question 116 Which one of the following properties

Which one of the following properties of electromagnetic waves do not change in vacuum?

- A. Speed
- B. Wavelength
- C. Frequency
- D. All of the above ✓ **Correct answer**

A. wrong on its own: the speed is constant in a vacuum, but the question asks for the option covering all the properties.

B. wrong on its own: the wavelength of a given wave does not change in a vacuum, but this option alone is incomplete.

C. wrong on its own: the frequency does not change in a vacuum, but this option alone is incomplete.

D. correct: in a vacuum the speed, wavelength and frequency of an electromagnetic wave

ge (the speed is c and λ and ν are fixed for that wave).

Question 117 In human being the carrier of

In human being, the carrier of colour blind is:

- A. Male
- B. Female ✓ **Correct answer**
- C. Both male and female
- D. None of them

A. wrong: a male with the colour-blind gene is affected, not a carrier (he has only one X chromosome).

B. correct: colour blindness is X-linked recessive, so a heterozygous female is the carrier.

C. wrong: only the heterozygous female is a carrier; a male cannot be a carrier of an X-linked recessive trait.

D. wrong: the female is the carrier.

Question 118 The correct electronic configuration of Nickel

The correct electronic configuration of Nickel (Z = 28) is:

- A. 1s 2 2s 2 2p 6 3s 2 3p 6 3d 8 4s 2 ✓ **Correct answer**
- B. 1s 2 2s 2 2p 6 3s 2 3p 6 3d 7 4s 2 4p 1
- C. 1s 2 2s 2 2p 6 3s 2 3p 6 3d 6 4s 2 4p 2
- D. 1s 2 2s 2 2p 6 3s 2 3p 6 3d 6 4s 1 4p 3

A. correct: nickel (Z = 28) has the configuration $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^8\ 4s^2$.

B. wrong: this gives $3d^7\ 4s^2\ 4p^1$, which is not the configuration of nickel.

C. wrong: this gives $3d^6\ 4s^2\ 4p^2$, which is not the configuration of nickel.

D. wrong: this gives $3d^6\ 4s^1\ 4p^3$, which is not the configuration of nickel. (The source prints

the "(28)" is the atomic number, written here as "(Z = 28)".)

Question 119 Hooks law correlates the

Hook's law correlates the:

- A. Force and displacement
- B. Force and extension
- C. Force and compression
- D. Stress and strain ✓ **Correct answer**

A. wrong: Hooke's law is about stress and strain, not force and displacement in general.

B. wrong: "force and extension" is the spring form (F = kx), not the statement of Hooke's law.

C. wrong: compression is only one case; Hooke's law is stated in terms of stress and strain.

D. correct: Hooke's law states that stress is directly proportional to strain (within the elastic limit).

Question 120 Ghani Khan is of Pashto

Ghani Khan is_____ of Pashto.

- A. John Keats
- B. a John Keats
- C. the John Keats ✓ **Correct answer**
- D. like John Keats

A. wrong: the article is needed — "is John Keats of Pashto" is not idiomatic.

B. wrong: "a John Keats" would mean "one of several", which is not the intended comparison.

C. correct: the idiom is "the John Keats of Pashto", meaning the Pashto equivalent of John

D. wrong: “is like John Keats of Pashto” is not the idiom.

Question 121 The number of ATP formed directly

The number of ATP formed directly by a single krebs cycle is:

- A. One ATP ✓ **Correct answer**
- B. Two ATP
- C. 32 ATP
- D. 36 ATP

A. correct: a single Krebs (citric acid) cycle directly forms one ATP (one GTP, which is equivalent to one ATP).

B. wrong: two ATP are formed by glycolysis, not by one Krebs cycle.

C. wrong: 32 ATP is of the order of the total yield of aerobic respiration, not of one Krebs cycle.

D. wrong: 36 ATP is the older total-yield figure for aerobic respiration, not the direct yield of one Krebs cycle.

Question 122 Select the correct equilibrium constant expression

Select the correct equilibrium constant expression, Kc for the following reversible reaction. Ce4+(aq) + Fe2+(aq) ⇌ Ce3+(aq) + Fe3+(aq)

- A. [Ce3+][Fe3+] / [Ce4+][Fe2+] ✓ **Correct answer**
- B. [Ce4+][Fe2+] / [Ce3+][Fe3+]
- C. [Ce3+][Fe2+] / [Ce4+][Fe3+]
- D. [Ce4+][Fe3+] / [Ce3+][Fe2+]

A. correct: for $Ce^{4+} + Fe^{2+} \rightleftharpoons Ce^{3+} + Fe^{3+}$ the equilibrium constant is the product of the product concentrations over the product of the reactant concentrations, Kc =

B. wrong: this is the reciprocal (reactants over products), not Kc.

C. wrong: this mixes one product with one reactant on each side.

D. wrong: this also mixes one product with one reactant on each side. (The four options are printed as fractions in the source using private-use characters; the fraction-bar positions were decoded from the source text layer, and the four options are the four standard permutations of the concentrations. The keyed answer (A) is the correct Kc.)

Question 123 MRI works on the principle of

MRI works on the principle of:

- A. Beats
- B. Interference
- C. Resonance ✓ **Correct answer**
- D. Standing waves

A. wrong: MRI does not work on the principle of beats.

B. wrong: MRI does not work on the principle of interference.

C. correct: MRI (magnetic resonance imaging) works on the principle of nuclear magnetic resonance.

D. wrong: MRI does not work on the principle of standing waves.

Question 124 Myoglobin combines with

Myoglobin combines with:

- A. Four oxygen molecules
- B. Three oxygen molecules
- C. Two oxygen molecules

e oxygen molecule ✓ **Correct answer**

A. wrong: myoglobin has a single haem group, so it binds only one oxygen molecule (haemoglobin, with four haem groups, binds four).

B. wrong: myoglobin binds only one oxygen molecule.

C. wrong: myoglobin binds only one oxygen molecule.

D. correct: myoglobin contains one haem group and combines with one molecule of oxygen.

Question 125 Sunken stomata are present in

Sunken stomata are present in:

- A. Hydrophytes
- B. Xerophytes ✓ **Correct answer**
- C. Mesophytes
- D. All of the above

A. wrong: hydrophytes (water plants) have stomata on the upper surface, not sunken stomata.

B. correct: sunken stomata are an adaptation of xerophytes (dry-habitat plants) to reduce water loss.

C. wrong: mesophytes (plants of moderate water supply) do not have sunken stomata.

D. wrong: sunken stomata are a xerophytic adaptation only.

Question 126 Bohr predicted the radius of the

Bohr predicted the radius of the orbit of the electron in hydrogen atom to be: $r = n^2h^2\varepsilon_0/\pi me^2$. If electron moves from n = 1 to n = 2, by how much times the radius of the orbit will increase?

nes

- B. 3 times ✓ **Correct answer**
- C. 4 times
- D. 5 times

A. wrong: the radius becomes four times the original, so the increase is three times, not two.

B. correct: the Bohr radius is $r \propto n^2$, so $r_2 = 4r_1$; the radius increases by $4r_1 - r_1 = 3r_1$, i.e. 3 times.

C. wrong: four times is the new radius itself ($r_2 = 4r_1$), not the increase.

D. wrong: the increase is three times, not five. (The Bohr-radius formula in this stem was restored from private-use characters in the source: $r = n^2h^2\varepsilon_0/\pi me^2$.)

Question 127 The waveform of sinusoidal voltage its

The waveform of sinusoidal voltage, its frequency and phase can be found by:

- A. CRO ✓ **Correct answer**
- B. Diode
- C. Transistor
- D. Radio

A. correct: a cathode-ray oscilloscope (CRO) displays the waveform of a sinusoidal voltage and lets the frequency and phase be measured.

B. wrong: a diode rectifies current; it does not display a waveform.

C. wrong: a transistor amplifies or switches current; it does not display a waveform.

D. wrong: a radio receives signals; it does not display a waveform.

128 Which blood group transfusion can be

Which blood group transfusion can be made without risk?

- A. Group A to group B
- B. Group AB to group O
- C. Group A to group O
- D. Group B to group AB ✓ **Correct answer**

A. wrong: group B blood contains anti-A antibodies, so group A blood would be rejected.

B. wrong: group O blood contains anti-A and anti-B antibodies, so group AB blood would be rejected.

C. wrong: group O blood contains anti-A antibodies, so group A blood would be rejected.

D. correct: group AB is the universal recipient (it has no anti-A or anti-B antibodies), so group B blood can be given to a group AB patient without risk.

Question 129 The first law of thermodynamics has

The first law of thermodynamics has a statement which implies that:

- A. No heat enters or leaves the system
- B. The temperature remains constant
- C. All work is mechanical
- D. Energy is conserved ✓ **Correct answer**

A. wrong: this describes an adiabatic process, not the first law.

B. wrong: this describes an isothermal process, not the first law.

C. wrong: the first law is not a statement about the kind of work.

D. correct: the first law of thermodynamics states that energy can neither be created nor destroyed ($\Delta U = Q - W$).

130 Haemophilia affects males more than females

Haemophilia affects males more than females because of:

- A. Dominant autosomes
- B. Dominant X- linked
- C. Recessive X- linked ✓ **Correct answer**
- D. y- chromosome linked

A. wrong: haemophilia is not a dominant autosomal trait.

B. wrong: haemophilia is recessive, not dominant.

C. correct: haemophilia is a recessive X-linked disorder, so it affects males (who have only one X chromosome) far more often than females.

D. wrong: haemophilia is X-linked, not Y-linked.

Question 131 The volume occupied by 32 g

The volume occupied by 3.2 g of oxygen at STP is:

- A. 22.4 dm 3
- B. 2.24 dm 3 ✓ **Correct answer**
- C. 11.2 dm 3
- D. 16.0 dm 3

A. wrong: 22.4 dm^3 is the volume of one mole of gas at STP; 3.2 g of oxygen is only 0.1 mol.

B. correct: 3.2 g of O_2 is 3.2/32 = 0.1 mol, and 0.1 mol occupies 0.1 × 22.4 = 2.24 dm^3 at STP.

C. wrong: 11.2 dm^3 is the volume of 0.5 mol, not 0.1 mol.

D. wrong: 16.0 dm^3 does not correspond to 0.1 mol at STP.

132 When a neutral body is rubbed

When a neutral body is rubbed and it becomes positively charged, it must have:

- A. Lost electrons ✓ **Correct answer**
- B. Lost protons
- C. Gained protons
- D. Gained electrons

A. correct: a neutral body becomes positively charged by losing (negatively charged) electrons.

B. wrong: protons are not lost by rubbing; the charge comes from electron transfer.

C. wrong: gaining protons would require adding positive charge, which rubbing does not do.

D. wrong: gaining electrons would make the body negatively charged.

Question 133 Penicillin is obtained from

Penicillin is obtained from:

- A. Algae
- B. Yeast
- C. Mushroom
- D. Mold ✓ **Correct answer**

A. wrong: penicillin is not obtained from algae.

B. wrong: penicillin is not obtained from yeast.

C. wrong: penicillin is not obtained from mushrooms.

D. correct: penicillin is obtained from the mould Penicillium (Penicillium notatum/chrysogenum). (The source prints a stray “99” after this option — a page number — which is removed here.)

134 Which of the following elements with

Which of the following elements with a given electronic configuration has the highest ionization potential value?

- A. 1s 2 2s 2 2p 3 ✓ **Correct answer**
- B. 1s 2 2s 2 2p 4
- C. 1s 2 2s 2 2p 6 3s 1
- D. 1s 2 2s 2 2p 6 3s 2 3p 3

A. correct: this is nitrogen ($2p^3$, a half-filled p subshell), which has the highest ionisation potential of the four — the half-filled subshell is extra stable, and nitrogen is in period 2 (smaller than phosphorus).

B. wrong: this is oxygen ($2p^4$), whose ionisation potential is lower than nitrogen's because the paired electron in $2p^4$ is easier to remove.

C. wrong: this is sodium ($3s^1$), an alkali metal with a very low ionisation potential.

D. wrong: this is phosphorus ($3p^3$), which also has a half-filled p subshell, but its ionisation potential is lower than nitrogen's because it is in period 3.

Question 135 When a charged particle enters a

When a charged particle enters a uniform magnetic field, there is a change in:

- A. Kinetic energy
- B. Magnitude of velocity
- C. Direction of velocity ✓ **Correct answer**
- D. All of these

A. wrong: the magnetic force is perpendicular to the velocity, so it does no work and the kinetic energy does not change.

B. wrong: the magnetic force changes the direction of the velocity, not its magnitude.

charged particle in a uniform magnetic field moves in a circular path because the magnetic force changes the direction of its velocity (the magnitude stays constant).

D. wrong: only the direction changes; the kinetic energy and the magnitude of the velocity do not change.

Question 136 Insuline is produced by

Insuline is produced by:

- A. Alpha-cells
- B. Beta-cells ✓ **Correct answer**
- C. Delta-cells
- D. Gamma-cells

A. wrong: the alpha cells of the islets of Langerhans secrete glucagon, not insulin.

B. correct: insulin is produced by the beta cells of the islets of Langerhans in the pancreas.

C. wrong: the delta cells secrete somatostatin, not insulin.

D. wrong: the gamma (PP) cells secrete pancreatic polypeptide, not insulin. (The source prints “Insuline” in the stem, a misprint for “Insulin”.)

Question 137 Which one is not responsible for

Which one is not responsible for the formation of acid rain?

- A. CO_2
- B. SO_2
- C. CO ✓ **Correct answer**
- D. NO_2

A. wrong: carbon dioxide dissolves in rain to form carbonic acid, so it does contribute to acid rain.

Sulphur dioxide forms sulphuric acid in rain, so it contributes to acid rain.

C. correct: carbon monoxide does not dissolve in rain to form an acid, so it is not responsible for acid rain.

D. wrong: nitrogen dioxide forms nitric acid in rain, so it contributes to acid rain.

Question 138 Which of the following hybridization can

Which of the following hybridization can explain the shape of BeCl 2 ?

- A. sp 2 hybridization
- B. sp hybridization ✓ **Correct answer**
- C. sp 3 hybridization
- D. dsp 2 hybridization

A. wrong: sp^2 hybridisation gives a trigonal planar shape, not the linear shape of $BeCl_2$.

B. correct: $BeCl_2$ is linear, which is explained by sp hybridisation of the beryllium atom.

C. wrong: sp^3 hybridisation gives a tetrahedral shape, not the linear shape of $BeCl_2$.

D. wrong: dsp^2 hybridisation gives a square planar shape, not the linear shape of $BeCl_2$.

Question 139 According to Millikans oil drop experiment

According to Millikan’s oil drop experiment the charge on an oil droplet is:

- A. Quantized
- B. Integral multiple of ‘e’
- C. Not less than ‘e’
- D. All of them ✓ **Correct answer**

A. wrong on its own: the charge is quantised, but this option alone is incomplete.

B. wrong on its own: the charge is an integral multiple of e, but this option alone is incomplete.

its own. the charge is never less than e, but this option alone is incomplete.

D. correct: Millikan's oil-drop experiment showed that the charge on an oil droplet is quantised, is an integral multiple of e, and is never less than e.

Question 140 Did he buy a car yesterday

Did he buy a car yesterday? Passive form of the sentence is:

- A. Was a car bought by him yesterday? ✓ **Correct answer**
- B. Has a car been bought by him yesterday?
- C. Is a car bought by him the other day?
- D. Had a car been bought by him yesterday?

A. correct: the past-simple active "Did he buy a car yesterday?" becomes the past-simple passive "Was a car bought by him yesterday?"

B. wrong: the present perfect ("has been bought") does not match the past simple of the original, and "yesterday" cannot be used with the present perfect.

C. wrong: the tense is wrong and "the other day" does not match "yesterday".

D. wrong: the past perfect ("had been bought") does not match the past simple of the original.

Question 141 The enthalpy of the elements at

The enthalpy of the elements at 1 atm: pressure and 298 K is arbitrary given the value of:

- A. 0.1
- B. 1.0
- C. 29.8
- D. Zero ✓ **Correct answer**

A. wrong: the standard enthalpy of formation of an element is defined as zero, not 0.1.

e standard enthalpy of formation of an element is defined as zero, not 1.0.

C. wrong: the standard enthalpy of formation of an element is defined as zero, not 29.8.

D. correct: by convention the enthalpy (standard enthalpy of formation) of an element in its standard state at 1 atm and 298 K is arbitrarily taken as zero.

Question 142 If two forces P and Q

If two forces P and Q are such that |P + Q| = |P — Q| ,then the angle between P and Q is:

- A. 0 0
- B. 30 0
- C. 90 0 ✓ **Correct answer**
- D. 180 0

A. wrong: if the angle were 0°, then |P + Q| would be P + Q and |P − Q| would be |P − Q|, which are not equal.

B. wrong: the equality |P + Q| = |P − Q| requires P·Q = 0, i.e. 90°, not 30°.

C. correct: $|P + Q|^2 = P^2 + Q^2 + 2PQ \cos\theta$ and $|P - Q|^2 = P^2 + Q^2 - 2PQ \cos\theta$; these are equal only when $\cos\theta = 0$, i.e. $\theta = 90°$.

D. wrong: if the angle were 180°, then |P + Q| = |P − Q| would not hold (except for P = Q = 0).

Question 143 Chlorophyll a and b chiefly absorb

Chlorophyll a and b chiefly absorb:

- A. Violet blue light
- B. Orange light
- C. Blue — red light ✓ **Correct answer**
- D. Red, orange light

lorophyll absorbs blue and red light, not violet-blue alone.

B. wrong: chlorophyll does not chiefly absorb orange light.

C. correct: chlorophyll a and b chiefly absorb light in the blue and red regions of the spectrum.

D. wrong: chlorophyll absorbs blue and red light, not red and orange.

Question 144 Select the correct statement about lattice

Select the correct statement about lattice energy:

- A. The energy absorbed when 1 mole of ionic crystal Lattice is formed from its constituent ions in the gaseous state.
- B. The energy liberated when 1 mole of an ionic crystal Lattice is formed from its constituent ions in the gaseous state ✓ **Correct answer**
- C. The energy liberated when 1 mole of an ionic crystal Lattice is splitted into its constituent ions in the gaseous state
- D. None of the above

A. wrong: lattice energy is liberated (released), not absorbed, when the crystal forms.

B. correct: lattice energy is the energy released when one mole of an ionic crystal is formed from its constituent gaseous ions.

C. wrong: splitting the crystal into ions absorbs energy; the energy liberated is on formation.

D. wrong: option (B) is correct.

Question 145 Two blocks of masses 10 kg

Two blocks of masses 1.0 kg and 3.0 kg placed in contact are acted upon by a force of 40 N. The acceleration of 1.0 kg mass will be:

m s -2

- B. 10 m s -2 ✓ **Correct answer**
- C. 30 m s -2
- D. 50 m s -2

A. wrong: 40 m/s² would be the acceleration of a 1 kg mass alone under 40 N; the two blocks move together (total mass 4 kg).

B. correct: the two blocks move together with total mass 1 + 3 = 4 kg, so a = F/m = 40/4 = 10 m/s², and the 1 kg block has this acceleration.

C. wrong: 30 m/s² does not follow from F = ma for the combined mass.

D. wrong: 50 m/s² does not follow from F = ma for the combined mass.

Question 146 Choose the correct sentence out of

Choose the correct sentence out of the following:

- A. Each of them deserves praise.
- B. Each one of them deserves praise.
- C. Each one of them deserve praise.
- D. Every one of them deserves praise. ✓ **Correct answer**

A. also correct: “each” takes a singular verb, so “Each of them deserves praise” is grammatical.

B. also correct: “Each one of them deserves praise” is grammatical.

C. wrong: “each one” is singular, so the verb must be “deserves”, not “deserve”.

D. correct: “every one” takes a singular verb, so “Every one of them deserves praise” is grammatical, and it is the keyed answer. (PICK-ONE: options (A), (B) and (D) are all correct sentences; the keyed answer (D) is filed. Decided by the assistant under the owner’s 8 Nov 2026 delegation.)

147 Following nasal passages are composed of

Following nasal passages are composed of cartilage except:

- A. Trachea
- B. Bronchus
- C. Broncheoles ✓ **Correct answer**
- D. Tracheoles

A. wrong: the trachea is supported by C-shaped rings of cartilage.

B. wrong: the bronchi are supported by plates of cartilage.

C. correct: the bronchioles have no cartilage in their walls (they are too small), so they are the exception.

D. wrong: tracheoles are the fine air tubes of insects, not part of the human airways.

Question 148 A set of xylem tissues are

A set of xylem tissues are:

- A. Vessels, tracheids, parenchyma ✓ **Correct answer**
- B. Sieve tubes, companion cell, fibers
- C. Parenchyma, sieve tube, vessels
- D. Fibers, companion cells, tracheids

A. correct: the xylem consists of vessels, tracheids, xylem parenchyma (and xylem fibres).

B. wrong: sieve tubes and companion cells are phloem tissues, not xylem.

C. wrong: sieve tubes are phloem, not xylem.

D. wrong: companion cells are phloem, not xylem.

149 Which of the following compounds on

Which of the following compounds on treatment with NaHCO3 will liberate C02?

- A. CH 3 COOH ✓ **Correct answer**
- B. C 2 H 5 NH 2
- C. CH 3 CO CH 3
- D. CH 3 CH 2 OH

A. correct: acetic acid is an acid, so it reacts with sodium bicarbonate to liberate carbon dioxide.

B. wrong: ethylamine is a base, so it does not liberate CO_2 from $NaHCO_3$.

C. wrong: acetone is a ketone, not an acid, so it does not liberate CO_2 from $NaHCO_3$.

D. wrong: ethanol is not acidic enough to liberate CO_2 from $NaHCO_3$.

Question 150 A body in equilibrium must not

A body in equilibrium must not have:

- A. Kinetic energy
- B. Velocity
- C. Momentum
- D. Acceleration ✓ **Correct answer**

A. wrong: a body in equilibrium can have kinetic energy (it can move with uniform velocity).

B. wrong: a body in equilibrium can have a constant velocity.

C. wrong: a body in equilibrium can have momentum (if it moves with uniform velocity).

D. correct: a body in equilibrium must have zero resultant force, so it must not have any acceleration.

151 Choose the correct sentence out of

Choose the correct sentence out of the following;

- A. The meeting does not approve in your scheme.
- B. The meeting do not approves of your scheme.
- C. The meeting does not approve of your scheme. ✓ **Correct answer**
- D. The meeting does not approve about your scheme.

A. wrong: “approve in” is not correct; the verb “approve” takes “of”.

B. wrong: “do not approves” is ungrammatical (the plural “do” with the third-person “approves”).

C. correct: “approve of” is the correct idiom, and “does not approve” agrees with the singular subject “meeting”.

D. wrong: “approve about” is not correct English.

Question 152 The interval of pace maker signals

The interval of pace maker signals from S.A.N to AV.N is:

- A. 01 second
- B. 0.1 second ✓ **Correct answer**
- C. 02 seconds
- D. 0.2 second

A. wrong: the SAN-to-AVN interval is 0.1 second, not 1 second.

B. correct: the pacemaker signal takes about 0.1 second to travel from the sinoatrial node (SAN) to the atrioventricular node (AVN).

C. wrong: the interval is 0.1 second, not 2 seconds.

D. wrong: the interval is 0.1 second, not 0.2 second.

153 Commonly used coagulant used for the

Commonly used coagulant used for the purification of water is:

- A. $Ca(NO_3)_2$
- B. $MgCl_2$
- C. $Al_2(SO_4)_3$ ✓ **Correct answer**
- D. $Ca(OH)_2$

A. wrong: calcium nitrate is not used as a coagulant for water purification.

B. wrong: magnesium chloride is not the coagulant used for water purification.

C. correct: aluminium sulphate (alum) is the commonly used coagulant for the purification of water.

D. wrong: calcium hydroxide (lime) is used for softening water, not as the coagulant. (The source prints a stray “100” after this option — a page number — which is removed here.)

Question 154 Forces controlling the reactions are proportional

Forces controlling the reactions are proportional to the product of the active masses (concentration) of chemicals. The above statement is of:

- A. Raoult’s Law
- B. Le Chatlier’s principle
- C. The law of conservation of energy
- D. The law of mass action ✓ **Correct answer**

A. wrong: Raoult’s law is about the vapour pressure of solutions, not about reaction rates.

B. wrong: Le Chatelier’s principle is about shifts in equilibrium, not about reaction rates.

C. wrong: the conservation of energy is not a statement about reaction rates.

D. correct: the law of mass action states that the rate of a reaction is proportional to the product of the active masses (concentrations) of the reactants.

155 Sound waves cannot be

Sound waves cannot be:

- A. Polarized ✓ **Correct answer**
- B. Reflected
- C. Refracted
- D. Diffracted

A. correct: sound waves are longitudinal, and only transverse waves can be polarised, so sound waves cannot be polarised.

B. wrong: sound waves can be reflected (echoes).

C. wrong: sound waves can be refracted.

D. wrong: sound waves can be diffracted.

Question 156 He said to me May you

He said to me, “May you succeed in life!” Indirect form of the sentence is:

- A. He said to me that may you succeed in life.
- B. He prayed that I might succeed in life. ✓ **Correct answer**
- C. He prayed that he might succeed in life.
- D. He prayed that you may succeed in life.

A. wrong: an optative sentence (“May you succeed”) is reported with “prayed” and “might”, not with “said … that may”.

B. correct: “May you succeed in life!” is a prayer/wish, reported as “He prayed that I might succeed in life.”

C. wrong: the wish was for “me” (the listener), so the pronoun must be “I”, not “he”.

D. wrong: in indirect speech “you” becomes “I” and “may” becomes “might”.

157 A Test cross is

A Test cross is:

- A. Tt × Tt
- B. Tt × tt ✓ **Correct answer**
- C. TT × Tt
- D. TT × TT

A. wrong: Tt × Tt is a monohybrid cross, not a test cross.

B. correct: a test cross is a cross between an individual of unknown genotype (Tt) and a homozygous recessive individual (tt).

C. wrong: TT × Tt is not a test cross (the recessive parent must be homozygous recessive).

D. wrong: TT × TT is a cross of two homozygous dominants, not a test cross.

Question 158 Which compound is formed when Ammonium

Which compound is formed when Ammonium hydroxide is added to silver chloride?

- A. [Ag (NH 3) 2] Cl ✓ **Correct answer**
- B. [Ag (NH 3)}Cl
- C. [Ag (NH 3) 4) Cl
- D. [Ag (NH 3) 6] Cl

A. correct: silver chloride dissolves in ammonium hydroxide to form the diamminesilver(I) chloride complex, $[Ag(NH_3)_2]Cl$.

B. wrong: the complex has two ammonia molecules, not one, and the formula is misprinted.

C. wrong: the complex has two ammonia molecules, not four.

D. wrong: the complex has two ammonia molecules, not six.

159 The spring constant of a spring

The spring constant of a spring is k. If the spring is cut into two halves then the spring constant of one of the half is:

- A. k + 2
- B. k/2
- C. 2k ✓ **Correct answer**
- D. k

A. wrong: the spring constant does not increase by 2.

B. wrong: cutting a spring in half increases (doubles) the spring constant, it does not halve it.

C. correct: the spring constant is inversely proportional to the length, so halving the length doubles the constant ($k' = 2k$).

D. wrong: the spring constant changes when the length changes.

Question 160 Carotenoid contains

Carotenoid contains:

- A. Caroteres
- B. Xanthophyils
- C. Chlorouhyil – C
- D. Both (A) and (B) ✓ **Correct answer**

A. wrong on its own: carotenes are one component of carotenoids, but xanthophylls are also present, so this option alone is incomplete.

B. wrong on its own: xanthophylls are one component of carotenoids, but carotenes are also present, so this option alone is incomplete.

C. wrong: chlorophyll C is not a carotenoid.

arotenoids contain both carotenes and xanthophylls. (The source misprints “Caroteres” for “Carotenes” and “Xanthophyils” for “Xanthophylls”.)

Question 161 Which one is spontaneous chemical reaction

Which one is spontaneous chemical reaction?

- A. Zn + Cu2+ → Zn+2 + Cu ✓ **Correct answer**
- B. Zn2+ + Cu → Cu2+ + Zn
- C. 2Fe(OH)3 → 2Fe + 3/2O2 + 3H2O
- D. 2NaCl → 2Na + Cl2

A. correct: zinc displaces copper from its salt (zinc is above copper in the reactivity series), so this redox reaction is spontaneous (E°cell = +1.10 V).

B. wrong: copper cannot displace zinc, so this reaction is not spontaneous.

C. wrong: the decomposition of iron(III) hydroxide is not spontaneous.

D. wrong: the electrolysis/decomposition of sodium chloride is not spontaneous. (The reaction arrow in this question was restored from a private-use character in the source.)

Question 162 A force of 6 N acts

A force of 6 N acts horizontally on a stationary mass of 2 kg for 4 s. The kinetic energy in Joule is:

- A. 12
- B. 144 ✓ **Correct answer**
- C. 72
- D. 48

A. wrong: 12 J is not the kinetic energy; the velocity after 4 s is 12 m/s, and KE = ½ × 2 × 12^2 = 144 J.

B. correct: the acceleration is a = F/m = 6/2 = 3 m/s^2, the velocity after 4 s is v = at = 12 m/s,

$V = \frac{1}{2} \times 2 \times 144 = 144$ J.

C. wrong: 72 J is half the correct value.

D. wrong: 48 J does not follow from the given force, mass and time.

Question 163 If it did not rain in

If it did not rain in time, there ___ a horrible famine.

- A. would have been
- B. will be
- C. would be ✓ **Correct answer**
- D. will have been

A. wrong: “would have been” is the third conditional, which needs “had not rained” in the if-clause, not “did not rain”.

B. wrong: “will be” does not follow a past-tense if-clause (“did not rain”).

C. correct: this is the second conditional — “If it did not rain in time, there would be a horrible famine.”

D. wrong: “will have been” is the future perfect, which does not fit this conditional.

Question 164 A person travels a distance x

A person travels a distance x = 20 t+2At 2 , where A is a constant. The acceleration of the person is:

- A. A/4ms – 2 ✓ **Correct answer**
- B. 4/A ms – 2
- C. 4ms – 2
- D. 4Ams – 2

A. wrong: the acceleration is 4A, not A/4.

e acceleration is 4A, not 4/A.

C. wrong: the acceleration is 4A (it depends on the constant A), not 4.

D. correct: $x = 20t + 2At^2$ gives $v = dx/dt = 20 + 4At$ and $a = dv/dt = 4A$.

Question 165 Attraction of water molecules to the

Attraction of water molecules to the xylem vessels is called:

- A. Adhesion ✓ **Correct answer**
- B. Cohesion
- C. Collision
- D. Corrosion

A. correct: adhesion is the attraction between water molecules and the walls of the xylem vessels (a different substance).

B. wrong: cohesion is the attraction between water molecules themselves.

C. wrong: collision is not the term for the attraction of water to the xylem walls.

D. wrong: corrosion is the chemical wearing away of a material, not an attraction.

Question 166 In which of the following compounds

In which of the following compounds hydrogen bonding is possible?

- A. PH 3
- B. CH 4
- C. NH 3 ✓ **Correct answer**
- D. SiH 4

A. wrong: phosphine (PH_3) does not form hydrogen bonds (phosphorus is not electronegative enough).

B. wrong: methane has no hydrogen attached to N, O or F, so it cannot form hydrogen

C. correct: ammonia has hydrogen attached to nitrogen, so it can form hydrogen bonds.

D. wrong: silane (SiH_4) does not form hydrogen bonds.

Question 167 Which of the following are Ohmic

Which of the following are Ohmic materials?

- A. Semiconductors
- B. Tungsten filament
- C. Thermistor
- D. Metals ✓ **Correct answer**

A. wrong: semiconductors are non-ohmic (their resistance changes with voltage and temperature).

B. wrong: a tungsten filament is non-ohmic (its resistance rises with temperature).

C. wrong: a thermistor is non-ohmic (its resistance changes with temperature).

D. correct: metals obey Ohm's law (V = IR with constant R at constant temperature), so they are ohmic materials.

Question 168 Tobacco is a

Tobacco is a:

- A. Long day plant ✓ **Correct answer**
- B. Short day plant
- C. Day neutral plant
- D. Intermediate plant

A. wrong: tobacco flowers when the days are short, not long.

B. correct: tobacco is a short day plant (it flowers when the photoperiod is below a critical

C. wrong: tobacco is not day-neutral; its flowering depends on day length.

D. wrong: tobacco is a short-day plant, not an intermediate plant.

Question 169 Ripening of fruits can be promoted

Ripening of fruits can be promoted by:

- A. Gibberellic acid
- B. Indole acetic acid
- C. Florigen
- D. Ethylene gas ✓ **Correct answer**

A. wrong: gibberellic acid promotes stem elongation and seed germination, not fruit ripening.

B. wrong: indole acetic acid (an auxin) promotes growth, not fruit ripening.

C. wrong: florigen promotes flowering, not fruit ripening.

D. correct: ethylene is the plant hormone that promotes the ripening of fruits.

Question 170 Sucrose sugar is considered as

Sucrose sugar is considered as:

- A. Monosaccharide
- B. Oligosacchides ✓ **Correct answer**
- C. Polysaccharides
- D. All of the above

A. wrong: sucrose is made of two monosaccharides (glucose + fructose), so it is not a monosaccharide.

B. correct: sucrose is a disaccharide, and disaccharides belong to the oligosaccharides.

sucrose is a disaccharide, not a polysaccharide.

D. wrong: sucrose is only an oligosaccharide, not a mono- or polysaccharide.

Question 171 In the nuclear reaction 11 Na

In the nuclear reaction 11 Na 2412 Mg 24 + X, the particle X is;

- A. Electron ✓ **Correct answer**
- B. Positron
- C. Proton
- D. Neutron

A. correct: in the reaction $^{11}Na^{24} \rightarrow {}^{12}Mg^{24} + X$, the atomic number increases by 1 (11 → 12) while the mass number stays 24, which is beta-minus decay — the emitted particle X is an electron (a β^- particle).

B. wrong: a positron would decrease the atomic number, not increase it.

C. wrong: emitting a proton would decrease the mass number.

D. wrong: emitting a neutron would decrease the mass number and leave the atomic number unchanged.

Question 172 The least toxic excretory product is

The least toxic excretory product is:

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

A. wrong: ammonia is the most toxic excretory product, not the least.

B. wrong: urea is less toxic than ammonia but more toxic than uric acid.

ic acid is the least toxic excretory product (it is almost insoluble and is excreted as a semi-solid).

D. wrong: a fatty acid is not an excretory product.

Question 173 Which one of the following will

Which one of the following will give an ionic product?

- A. CH3CH2OH + PCl5 →
- B. CH3CH2OH + Na → ✓ **Correct answer**
- C. CH3CH2OH + PCl3 →
- D. CH3CH2OH + SOCl2 →

A. wrong: ethanol with PCl_5 gives ethyl chloride (a covalent product), not an ionic product.

B. correct: ethanol reacts with sodium to give sodium ethoxide ($CH_3CH_2O^-Na^+$), an ionic product.

C. wrong: ethanol with PCl_3 gives ethyl chloride (a covalent product), not an ionic product.

D. wrong: ethanol with $SOCl_2$ gives ethyl chloride (a covalent product), not an ionic product. (The reaction arrows in this question were restored from private-use characters, and “5oCl 2” in option (D) is corrected to “$SOCl_2$”.)

Question 174 The angular displacement made by the

The angular displacement made by the minute hand of a watch after 5.0 minutes is:

- A. 30 0 ✓ **Correct answer**
- B. 120 0
- C. 180 0
- D. 360 0

A. correct: the minute hand turns 360° in 60 minutes, so in 5 minutes it turns 360 × 5/60 = 30°.

0° would be the displacement after 20 minutes, not 5.

C. wrong: 180° would be the displacement after 30 minutes, not 5.

D. wrong: 360° is the displacement after a full hour, not after 5 minutes.

Question 175 The intensity of a wave is

The intensity of a wave is:

- A. Directly proportional to amplitude
- B. Directly proportional to (amplitude) 2 ✓ **Correct answer**
- C. Inversely proportional to amplitude
- D. Inversely proportional to (amplitude) 2

A. wrong: the intensity is proportional to the square of the amplitude, not to the amplitude itself.

B. correct: the intensity of a wave is proportional to the square of its amplitude ($I \propto A^2$).

C. wrong: the intensity increases with amplitude, it does not decrease.

D. wrong: the intensity is directly, not inversely, proportional to the square of the amplitude.

Question 176 The diameter of human capillary is

The diameter of human capillary is:

- A. 5 microns
- B. 6 microns
- C. 7 microns ✓ **Correct answer**
- D. 8 microns

A. wrong: the diameter of a human capillary is about 7 microns, not 5.

B. wrong: the diameter is about 7 microns, not 6.

e diameter of a human capillary is about 7 microns (just wide enough for a red blood cell to pass through).

D. wrong: the diameter is about 7 microns, not 8.

Question 177 Organisms phenotypically similar but genotypically different

Organisms phenotypically similar but genotypically different are said to be:

- A. Monozygous
- B. Homozygous
- C. Heterozygous ✓ **Correct answer**
- D. Multizygous

A. wrong: monozygous refers to identical twins from a single zygote, not to organisms that are phenotypically similar but genotypically different.

B. wrong: a homozygous organism has two identical alleles; the question describes the contrast between a heterozygote and a homozygous dominant, which look alike but differ genetically.

C. correct: a heterozygous organism (e.g. Tt) is phenotypically similar to the homozygous dominant (TT) but genotypically different, which is the contrast the question describes.

D. wrong: “multizygous” is not a standard genetic term. (The source prints a stray “101” after this option — a page number — which is removed here.)

Question 178 Which of the following can function

Which of the following can function as Lewis acid?

- A. CN
- B. NH 3
- C. CH 3 – O – CH 3

A. wrong: the cyanide ion (CN^-) donates an electron pair, so it is a Lewis base, not a Lewis acid.

B. wrong: ammonia donates its lone pair, so it is a Lewis base, not a Lewis acid.

C. wrong: dimethyl ether donates the oxygen lone pair, so it is a Lewis base, not a Lewis acid.

D. correct: the iodonium ion (I^+) is electron-deficient and can accept an electron pair, so it functions as a Lewis acid.

Question 179 Conversion of alternating current into direct

Conversion of alternating current into direct current is called:

- A. Rectification ✓ **Correct answer**
- B. Amplification
- C. Oscillation
- D. Regeneration

A. correct: the conversion of alternating current (AC) into direct current (DC) is called rectification.

B. wrong: amplification increases the magnitude of a signal; it does not convert AC to DC.

C. wrong: oscillation is the production of an alternating signal, not the conversion of AC to DC.

D. wrong: regeneration is the restoration of a signal, not the conversion of AC to DC.

Question 180 Gibberellin was isolated from

Gibberellin was isolated from:

- A. An algae

ngus ✓ **Correct answer**

- C. A bacterium
- D. A virus

A. wrong: gibberellin was not isolated from an alga.

B. correct: gibberellin was isolated from the fungus Gibberella fujikuroi (which causes bakanae disease of rice).

C. wrong: gibberellin was not isolated from a bacterium.

D. wrong: gibberellin was not isolated from a virus.

Question 181 All amino acids found in proteins

All amino acids found in proteins are:

- A. α-amino acids ✓ **Correct answer**
- B. β-amino acids
- C. Both α and β
- D. None of the above

A. correct: all the amino acids found in proteins are α-amino acids (the amino group is attached to the α-carbon).

B. wrong: β-amino acids are not found in proteins.

C. wrong: only α-amino acids occur in proteins.

D. wrong: option (A) is correct. (The α and β symbols in this question were restored from private-use characters in the source.)

Question 182 Which of the following pairs have

Which of the following pairs have the same units and dimensions?

- A. Resistance and resistivity

ductivity and resistivity

- C. Electromotive force and potential difference ✓ **Correct answer**
- D. Resistivity and temperature coefficient of resistivity

A. wrong: resistance (ohm) and resistivity (ohm-metre) have different units and dimensions.

B. wrong: conductivity and resistivity are reciprocals, so they have different units and dimensions.

C. correct: e.m.f. and potential difference both have the unit volt and the same dimensions.

D. wrong: resistivity and its temperature coefficient have different units and dimensions.

Question 183 Process of bone formation is called

Process of bone formation is called:

- A. Calcification
- B. Chondrification
- C. Decaleification
- D. Ossification ✓ **Correct answer**

A. wrong: calcification is the deposition of calcium salts, which is only part of bone formation.

B. wrong: chondrification is the formation of cartilage, not bone.

C. wrong: decalcification is the removal of calcium salts, the opposite of bone formation.

D. correct: the process of bone formation is called ossification.

Question 184 Which is a trimer of ethyne

Which is a trimer of ethyne?

- B. Benzene ✓ **Correct answer**
- C. Toluene
- D. Teflon

A. wrong: PVC (polyvinyl chloride) is a polymer of vinyl chloride, not a trimer of ethyne.

B. correct: benzene (C_6H_6) is the cyclic trimer of ethyne ($3\ C_2H_2 \rightarrow C_6H_6$).

C. wrong: toluene is methylbenzene, not a trimer of ethyne.

D. wrong: Teflon is a polymer of tetrafluoroethylene, not a trimer of ethyne.

Question 185 The activity of the radioactive material

The activity of the radioactive material can be expressed in the units of:

- A. Curie
- B. Becquerel
- C. Tesla
- D. Both (A) and (B) ✓ **Correct answer**

A. wrong on its own: the curie is a unit of activity, but the becquerel is also a unit of activity, so this option alone is incomplete.

B. wrong on its own: the becquerel is a unit of activity, but the curie is also a unit of activity, so this option alone is incomplete.

C. wrong: the tesla is the unit of magnetic flux density, not of radioactivity.

D. correct: the activity of a radioactive material is expressed in curies and in becquerels.

Question 186 Bicep muscle is attached to the

Bicep muscle is attached to the humerus by:

- A. Tendon ✓ **Correct answer**

- C. Elastic fibers
- D. Areolar

A. correct: the biceps muscle is attached to the humerus (and to the radius) by a tendon.

B. wrong: ligaments join bone to bone, not muscle to bone.

C. wrong: elastic fibres are not what attaches the biceps to the humerus.

D. wrong: areolar tissue is a loose connective tissue, not the attachment of the biceps.

Question 187 Which is NOT true about amino

Which is NOT true about amino acids?

- A. They have two functional groups
- B. They show both acidic and basic characteristics
- C. They are the basic units of proteins
- D. They do not exist in solid state ✓ **Correct answer**

A. wrong: amino acids do have two functional groups (—NH_2 and —COOH), so this statement is true.

B. wrong: amino acids are amphoteric, so this statement is true.

C. wrong: amino acids are the basic units of proteins, so this statement is true.

D. correct: this statement is NOT true — amino acids exist in the solid state (as crystalline solids).

Question 188 The work function of a metal

The work function of a metal is 6.63 eV. The threshold frequency of the metal is:

- A. 1.6 × 10 15 Hz ✓ **Correct answer**
- B. 1.6 × 10 12 Hz

- D. 1.6 × 10 -19 Hz

A. correct: the threshold frequency is $f_0 = \varphi/h = 6.63\ \text{eV} / (4.14 \times 10^{-15}\ \text{eV·s}) = 1.6 \times 10^{15}$ Hz.

B. wrong: the threshold frequency is 10^{15} Hz, not 10^{12} Hz.

C. wrong: 6.63×10^{-34} is Planck's constant (in J·s), not a frequency.

D. wrong: 1.6×10^{-19} is the charge of an electron (in coulombs), not a frequency.

Question 189 Concentration of water molecules is inversely

Concentration of water molecules is inversely proportional to the:

- A. Water potential
- B. Pressure potential
- C. Solute potential ✓ **Correct answer**
- D. Osmotic potential

A. wrong: the concentration of water molecules is related to the solute potential, not directly to the total water potential.

B. wrong: pressure potential is the hydrostatic pressure component, not the one inversely related to water concentration.

C. correct: as the solute concentration rises, the solute potential falls (becomes more negative) and the concentration of water molecules falls, so the water concentration is inversely proportional to the solute potential.

D. wrong: osmotic potential is essentially the same quantity as solute potential, but the textbook's term for this relationship is solute potential. (Osmotic potential and solute potential are the same quantity; the keyed answer is the textbook's term, solute potential.)

190 Which is the least polar molecule

Which is the least polar molecule?

- A. HF
- B. HI ✓ **Correct answer**
- C. HCI
- D. HBr

A. wrong: HF has the largest electronegativity difference, so it is the most polar, not the least.

B. correct: the H–I bond has the smallest electronegativity difference of the four, so HI is the least polar molecule.

C. wrong: HCl is more polar than HI.

D. wrong: HBr is more polar than HI.

Question 191 The birds sitting on an overhead

The birds sitting on an overhead transmission line suffer no harmful effects because:

- A. Their bodies have high resistance
- B. Their feet are good insulators
- C. There is negligible potential difference between their feet ✓ **Correct answer**
- D. Wires are insulated

A. wrong: the bird's resistance is not what protects it; the protection comes from the lack of a potential difference.

B. wrong: the bird's feet are not insulators; the protection comes from the lack of a potential difference.

C. correct: both feet are at (nearly) the same potential, so no current flows through the bird's body.

ernead transmission wires are generally bare, not insulated.

Question 192 They arrived at about mid night

They arrived at about mid night

- A. because their flight was detained.
- B. because their flight was delayed. ✓ **Correct answer**
- C. because their flight was derailed.
- D. because their flight was diverted.

A. wrong: “detained” means held by an authority (e.g. the police), which does not apply to a flight.

B. correct: a flight that arrives late is “delayed”.

C. wrong: “derailed” applies to trains, not flights.

D. wrong: a diverted flight lands at a different airport; it does not arrive late at its destination.

Question 193 The target organ for vasopressin is

The target organ for vasopressin is:

- A. Heart
- B. Liver
- C. Stomach
- D. Kidneys ✓ **Correct answer**

A. wrong: vasopressin does not act primarily on the heart.

B. wrong: vasopressin does not act primarily on the liver.

C. wrong: vasopressin does not act on the stomach.

D. correct: vasopressin (antidiuretic hormone, ADH) acts on the kidneys, increasing water

n in the collecting ducts.

Question 194 Ketones are prepared by the oxidation

Ketones are prepared by the oxidation with Na 2 Cr 2 O 7 and H 2 S0 4 of:

- A. Primary alcohol
- B. Secondary alcohol ✓ **Correct answer**
- C. Tertiary alcohol
- D. All of the above

A. wrong: oxidation of a primary alcohol gives an aldehyde (and then a carboxylic acid), not a ketone.

B. correct: oxidation of a secondary alcohol with $Na_2Cr_2O_7/H_2SO_4$ gives a ketone.

C. wrong: tertiary alcohols resist oxidation.

D. wrong: only secondary alcohols give ketones on oxidation.

Question 195 The sinusoidal AC current in a

The sinusoidal AC current in a circuit is I = 50 sin (20 t). The peak value of current is:

- A. 100 A
- B. 25 A
- C. 50 A ✓ **Correct answer**
- D. 20 A

A. wrong: 100 A is twice the peak value.

B. wrong: 25 A is half the peak value.

C. correct: in I = 50 sin(20t) the coefficient 50 is the peak (maximum) value of the current, 50 A.

D. wrong: 20 is the angular frequency, not the peak current.

196 Thirst is controlled by

Thirst is controlled by:

- A. Pituitary gland ✓ **Correct answer**
- B. Adrenal gland
- C. Parathyroid
- D. Thyroid

A. correct: thirst is controlled by the pituitary gland through the release of vasopressin (ADH), which regulates water balance.

B. wrong: the adrenal gland secretes aldosterone and adrenaline, not the hormone that controls thirst.

C. wrong: the parathyroid regulates calcium, not thirst.

D. wrong: the thyroid regulates metabolism, not thirst. (The thirst centre itself lies in the hypothalamus, but the textbook's answer for the gland controlling thirst is the pituitary, via ADH.)

Question 197 Which of the following is a

Which of the following is a condensation polymer?

- A. Nylon 6,6 ✓ **Correct answer**
- B. Teflon
- C. Polypropylene
- D. Orlon

A. correct: nylon-6,6 is formed by condensation polymerisation (of hexamethylenediamine and adipic acid, with loss of water).

B. wrong: Teflon is an addition polymer (of tetrafluoroethylene).

C. wrong: polypropylene is an addition polymer (of propylene).

·ion (polyacrylonitrile) is an addition polymer.

Question 198 Current in the semiconductors is caused

Current in the semiconductors is caused by the movement of:

- A. Protons
- B. Electrons only
- C. Holes only
- D. Both electrons and holes ✓ **Correct answer**

A. wrong: protons do not carry current in a semiconductor.

B. wrong: in a semiconductor the current is carried by electrons and by holes.

C. wrong: in a semiconductor the current is carried by holes and by electrons.

D. correct: current in a semiconductor is caused by the movement of both electrons and holes.

Question 199 Auxins inhibit the growth of

Auxins inhibit the growth of:

- A. Apical buds
- B. Lateral buds ✓ **Correct answer**
- C. Parthenocarpy
- D. Root growth

A. wrong: auxins promote the growth of apical buds (apical dominance), they do not inhibit them.

B. correct: auxins inhibit the growth of lateral buds (this is apical dominance).

C. wrong: auxins promote parthenocarpy (fruit formation without fertilisation), they do not inhibit it.

auxins promote root growth at low concentrations; the textbook answer for inhibition is lateral buds.

Question 200 Which of the following statement is

Which of the following statement is NOT true?

- A. Natural rubber is hydrocarbon
- B. Natural rubber is isoprene ✓ **Correct answer**
- C. Natural rubber is polymer of 1, 3 Butadiene
- D. Natural rubber can be volcanized

A. wrong: this statement is true — natural rubber (polyisoprene) is a hydrocarbon.

B. correct: this statement is NOT true — natural rubber is polyisoprene (a polymer of isoprene), not isoprene itself, and it is the keyed answer.

C. also not true: natural rubber is a polymer of isoprene (2-methyl-1,3-butadiene), not of 1,3-butadiene itself.

D. wrong: this statement is true — natural rubber can be vulcanised. (PICK-ONE: options (B) and (C) are both not true; the keyed answer (B) is filed. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

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