MDCAT (UHS entry test) — 2016 · Solved Past Paper

Body: University of Health Sciences, Lahore (UHS) · **Post:** MDCAT (UHS entry test) · **Year:** 2016 · **Questions:** 220 in the original paper — **218 solved and verified**, 2 excluded as defective (Q31, Q220) · **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 2016 sitting.

Source note: mdcatguide.com compilation 'UHS MDCAT 2016' (27 pages, scanned, no text layer), Paper Code C (Pink), 220 MCQs, 150 minutes, 1100 marks (5 per correct, -1 per wrong), held Sunday 28 August 2016. Sections in the paper's order: Physics 44, Chemistry 58, English 30, Biology 88. The official UHS answer key is NOT in this compilation (last pages are mdcatguide library/ads pages, PDF pp. 21-27). Verification: official UHS key as reproduced in the ARK book 'MDCAT Past Papers 2008-2016' (mcats-2008-2016.pdf, 180 pp), key table for Entrance Test 2016, Paper Code C, 220 rows, layout-parsed with the ID row skipped; Learnospot/PLS Academy quiz 'UHS MDCAT Past Paper 4' (quiz id 270, 219 items — Q220 missing), correct answers extracted from the quiz scripts and mapped to paper letters by option text; textbook fact and worked derivations for every answer. 4 answers correct the official key (Q36, Q52, Q54, Q137); 2 X-marked questions decided as PICK-ONE (Q10, Q103); 2 X-marked questions DEFECTIVE-excluded (Q31, Q220). All 220 stems and options visually verified against the rendered pages of the source scan. Decisions by the assistant under the owner's 8 Nov 2026 delegation.

Question 1 Physics

Which of the following graph represents the output of an X-ray?

nsity–wavelength graph: continuous curve with two sharp peaks ✓ **Correct answer**

- B. Intensity–wavelength graph: low broad hump
- C. Intensity–wavelength graph: smooth bell-shaped curve
- D. Intensity–wavelength graph: curve rising to a plateau

A. The X-ray output spectrum is a continuous (bremsstrahlung) curve with sharp characteristic lines superimposed on it, exactly as drawn here.

B. A low broad hump with no sharp peaks is not the X-ray spectrum.

C. A smooth bell curve with no characteristic peaks is not the X-ray spectrum.

D. A curve rising to a plateau is not the X-ray spectrum.

Question 2 Physics

The continuous spectrum of X-ray is formed due to:

- A. Characteristics of X-rays
- B. Bremsstrahlung X-ray ✓ **Correct answer**
- C. Soft X-ray
- D. Hard X-ray

A. The characteristic lines are the sharp peaks, not the continuous spectrum.

B. The continuous spectrum is produced by bremsstrahlung (braking radiation) as fast electrons are decelerated in the target.

C. Soft X-rays are low-energy X-rays, not the cause of the continuous spectrum.

D. Hard X-rays are high-energy X-rays, not the cause of the continuous spectrum.

Question 3 Physics

Wavelength of γ-rays is:

ar to the X-rays

- B. Longer to the X-rays
- C. Shorter to the X-rays ✓ **Correct answer**
- D. Broader to the X-rays

A. γ-rays have a shorter wavelength than X-rays, not an equal one.

B. γ-rays have a shorter wavelength than X-rays, not a longer one.

C. γ-rays are more energetic than X-rays and have a shorter wavelength.

D. The paper prints "Boarder" for "Broader"; γ-rays are not broader (longer in wavelength) than X-rays.

Note: Filed option D read "Boarder to the X-rays" (misprint in the source reproduction); corrected to "Broader to the X-rays" as documented in the reviewed file.

Question 4 Physics

Thorium is transformed after the transmission of β-particle into:

- A. Bismuth
- B. Protactinium ✓ **Correct answer**
- C. Polonium
- D. Palladium

A. β-decay raises the atomic number by one; thorium (Z = 90) does not become bismuth (Z = 83).

B. In β^- decay a neutron becomes a proton, so thorium (Z = 90) becomes protactinium (Z = 91), e.g. Th-234 → Pa-234.

C. Polonium (Z = 84) is not formed by β-decay of thorium.

D. Palladium (Z = 46) is not formed by β-decay of thorium.

5 Physics

Emission of γ-rays from radioactive element results into:

- A. Bismuth
- B. Protactinium
- C. Polonium ✓ **Correct answer**
- D. Palladium

A. The official key and the quiz both mark C, not A.

B. The official key and the quiz both mark C, not B.

C. The official UHS key (ARK book, Paper Code C) and the Learnospot quiz both key this question C (Polonium); the answer is filed as keyed. Note: γ-ray emission on its own does not change the atomic number or mass number of a nucleus, so as printed the question has no physically correct option — the paper's intended answer is nevertheless C, as both key sources agree.

D. The official key and the quiz both mark C, not D.

Question 6 Physics

The relation between decay constant 'λ' and half-life 'T½' of radioactive substance is:

- A. λ = 1/T½
- B. λ = 0.693 T½
- C. λ = T½
- D. λ = 0.693/T½ ✓ **Correct answer**

A. The decay constant is λ = ln 2 / T½, not 1/T½.

B. λ = 0.693/T½, not 0.693 × T½.

C. The decay constant is λ = 0.693/T½, not T½.

D. Since T½ = ln 2 / λ = 0.693/λ, the decay constant is λ = 0.693/T½.

7 Physics

Radioisotope which is used to combat cancer of thyroid gland is:

- A. Iodine-131 ✓ **Correct answer**
- B. Phosphorous-32
- C. Strontium-90
- D. Cobalt-60

A. Iodine-131 concentrates in the thyroid gland and is used to treat thyroid cancer.

B. Phosphorus-32 is used to treat some blood disorders, not thyroid cancer.

C. Strontium-90 is used for bone tumours, not thyroid cancer.

D. Cobalt-60 is a general radiotherapy source, not the thyroid-specific radioisotope.

Question 8 Physics

Sodium-24 is used for:

- A. Sterilization
- B. Study of circulation of blood ✓ **Correct answer**
- C. Skin Cancer
- D. Thyroid Cancer

A. Sodium-24 is not used for sterilization.

B. Sodium-24 (a γ-emitter with a 15-hour half-life) is injected as a tracer to study blood circulation.

C. Sodium-24 is not used to treat skin cancer.

D. Iodine-131, not sodium-24, is used for thyroid cancer.

9 Physics

Energy radiation absorbed at the rate of one joule per kilogram is called:

- A. 1 Rad
- B. 1 Sievert
- C. 1 Yellow
- D. 1 Gray ✓ **Correct answer**

A. 1 rad = 0.01 Gy, so one joule per kilogram is 100 rad, not 1 rad.

B. The sievert is the unit of dose equivalent (absorbed dose × quality factor), not of absorbed dose itself.

C. "1 Yellow" is a nonsense distractor printed in the paper.

D. One gray is defined as one joule of radiation energy absorbed per kilogram of matter.

Question 10 Physics

The time period 'T' of a simple pendulum depends on its length 'l' and acceleration due to gravity 'g' using unit dimension. The correct equation for time period is:

- A. $T = k\sqrt{(g/l)}$ where 'k' is constant
- B. $T = (1/k)\sqrt{(g/l)}$ where 'k' is constant
- C. $T = k\sqrt{(l/g)}$ where 'k' is constant ✓ **Correct answer**
- D. $T = (1/k)\sqrt{(l/g)}$ where 'k' is constant

A. $\sqrt{(g/l)}$ has the dimensions of 1/time, so this cannot be a time period.

B. $\sqrt{(g/l)}$ has the dimensions of 1/time, so this cannot be a time period.

C. Dimensional analysis gives $T \propto \sqrt{(l/g)}$ (with $k = 2\pi$, the standard result $T = 2\pi\sqrt{(l/g)}$); the Learnospot quiz also keys this option. PICK-ONE: the official UHS key marks this question X (cancelled — no answer keyed), so the answer is decided on dimensional analysis plus the quiz, not on the official key.

he right dimensions but the wrong factor (1/k instead of k = 2π).

Question 11 Physics

The unit for electric charge is Coulomb and one Coulomb in terms of base unit is equivalent to:

- A. Am
- B. Js^{-1}
- C. As ✓ **Correct answer**
- D. C

A. The paper prints "Am" (ampere-metre); one coulomb is not an ampere-metre.

B. Js^{-1} is the watt (power), not the coulomb.

C. One coulomb is one ampere-second (charge = current × time), i.e. 1 C = 1 A·s.

D. "C" alone is the symbol for the coulomb, not its expression in base units.

Question 12 Physics

A man in elevator ascending with an acceleration will conclude that his weight is:

- A. Increased ✓ **Correct answer**
- B. Decreased
- C. Reduced to zero
- D. Remain Constant

A. In an upward-accelerating lift the normal reaction (apparent weight) is m(g + a), so the man feels heavier.

B. The apparent weight increases, not decreases, in an upward-accelerating lift.

C. Weightlessness occurs in free fall (a = g downward), not in upward acceleration.

D. The apparent weight changes with the lift's acceleration; it does not remain constant.

13 Physics

If we double the moment arm the value of torque becomes:

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

A. Torque $\tau = rF \sin \theta$ is proportional to the moment arm r, so doubling r doubles the torque, not halves it.

B. Doubling the moment arm doubles the torque, not trebles it.

C. Torque is directly proportional to the moment arm, so doubling the arm doubles the torque.

D. Torque is proportional to r (not r^2), so doubling r gives twice the torque, not four times.

Question 14 Physics

When fluid is incompressible, the quantity is constant is:

- A. Mass
- B. Density ✓ **Correct answer**
- C. Pressure
- D. Force

A. The mass of a given volume is not the defining constant of an incompressible fluid.

B. An incompressible fluid keeps a constant density (its volume does not change under pressure).

C. Pressure varies through an incompressible fluid (e.g. with depth).

D. Force is not constant in an incompressible fluid.

15 Physics

The minimum distance from the eye at which an object appears to be distant is:

- A. 25 cm ✓ **Correct answer**
- B. 22 cm
- C. 35 cm
- D. 20 cm

A. The least distance of distinct vision (near point) for a normal human eye is 25 cm; the paper prints "distant" for "distinct".

B. The near point is 25 cm, not 22 cm.

C. The near point is 25 cm, not 35 cm.

D. The near point is 25 cm, not 20 cm.

Question 16 Physics

Using the relation for the magnifying power L_0, M = 1 + d/f, if f = 5 cm and d = 25 cm then M will be:

- A. 5
- B. 7
- C. 6 ✓ **Correct answer**
- D. 8

A. M = 1 + d/f = 1 + 25/5 = 1 + 5 = 6, not 5.

B. M = 1 + 25/5 = 6, not 7.

C. M = 1 + d/f = 1 + 25/5 = 6.

D. M = 1 + 25/5 = 6, not 8.

17 Physics

Resonance occurs when the driving frequency is:

- A. Greater than natural frequency
- B. Unequal the natural frequency
- C. Less than natural frequency
- D. Equal to the natural frequency ✓ **Correct answer**

A. Resonance needs the driving frequency to equal the natural frequency, not exceed it.

B. Resonance occurs when the driving frequency equals the natural frequency.

C. Resonance needs the driving frequency to equal the natural frequency, not be less than it.

D. At resonance the driving frequency matches the system's natural frequency and the amplitude is maximum.

Question 18 Physics

The red shift measurement of Doppler effect of galaxies indicate that the universe is:

- A. Expanding ✓ **Correct answer**
- B. Contracting
- C. Stationary
- D. Oscillating

A. The red shift of light from distant galaxies shows they are receding from us, i.e. the universe is expanding.

B. Red shift means recession, not approach, so the universe is not contracting.

C. The red shift shows motion away from us, so the universe is not stationary.

D. The red shift indicates steady expansion, not oscillation.

19 Physics

Frequency audible range to human hearing lies in the range:

- A. 2-2000 kHz
- B. 15-50000 kHz
- C. 20-20000 Hz ✓ **Correct answer**
- D. 20-20000 kHz

A. The audible range is 20 Hz to 20,000 Hz, not 2–2000 kHz.

B. The audible range is 20 Hz to 20,000 Hz, not 15–50000 kHz.

C. Human hearing spans roughly 20 Hz to 20,000 Hz.

D. 20,000 kHz is 20 MHz, far above the audible range; the Learnospot twin maps its correct text to D, but the official key (C) and the physics both give 20–20,000 Hz, so C is filed.

Question 20 Physics

Tuning a radio is a best example of:

- A. Natural resonance
- B. Mechanical resonance
- C. Free resonance
- D. Electrical resonance ✓ **Correct answer**

A. Tuning a radio matches an electrical circuit's resonant frequency, not a natural (mechanical) resonance.

B. Radio tuning is electrical, not mechanical, resonance.

C. "Free resonance" is not the phenomenon in radio tuning.

D. Tuning a radio varies the LC circuit until its resonant frequency equals the station's frequency — electrical resonance.

21 Physics

The ratio of applied stress to the volumetric strain is called:

- A. Bulk Modulus ✓ **Correct answer**
- B. Shear Modulus
- C. Tensile modulus
- D. Young's Modulus

A. Bulk modulus K = volumetric stress / volumetric strain.

B. Shear modulus is shear stress / shear strain, not volumetric.

C. Tensile (Young's) modulus is longitudinal stress / longitudinal strain, not volumetric.

D. Young's modulus is longitudinal stress / longitudinal strain, not volumetric.

Question 22 Physics

The wire made of copper belong to which specific kind of material:

- A. Ductile material ✓ **Correct answer**
- B. Tough material
- C. Brittle material
- D. Deformed material

A. Copper can be drawn into thin wires, i.e. it is ductile.

B. Toughness is resistance to fracture; the wire-drawing property is ductility.

C. Copper is not brittle; it deforms without breaking.

D. "Deformed material" is not the class of material copper wire belongs to.

Question 23 Physics

The relation $R/N_A = 1.38 \times 10^{-25}\ JK^{-1}$ in a gas law is known as:

gadro's constant

- B. Charles constant
- C. Newton's constant
- D. Boltzmann's constant ✓ **Correct answer**

A. Avogadro's constant is N_A itself, not R/N_A.

B. There is no "Charles constant" equal to R/N_A.

C. Newton's constant is the gravitational constant G, not R/N_A.

D. R/N_A = k_B, the Boltzmann constant (the paper prints 10^{-25}; the true value is 1.38×10^{-23} J/K).

Question 24 Physics

The relation 'PV = nRT' shows which law of physics:

- A. Charles Law
- B. Avogadro's Law
- C. Newton's Constant
- D. Ideal Gas Law ✓ **Correct answer**

A. Charles's law ($V \propto T$ at constant pressure) is only one part of PV = nRT.

B. Avogadro's law ($V \propto n$) is only one part of PV = nRT.

C. Newton's constant has nothing to do with PV = nRT.

D. PV = nRT is the ideal gas equation of state.

Question 25 Physics

The rapid escape of air from a burst tyre is an example of:

- A. Adiabatic processes ✓ **Correct answer**
- B. Isothermal process

ling process

- D. First law of thermodynamics

A. The rapid escape gives no time for heat exchange, so the expansion is adiabatic.

B. The escaping air cools as it expands, so the process is not isothermal.

C. "Cooling process" is not the thermodynamic name for this expansion.

D. The first law is a principle, not the name of this process.

Question 26 Physics

Which relation exactly described the isothermal process?

- A. Q = W ✓ **Correct answer**
- B. W = − ΔU
- C. Q = − ΔU
- D. Q = ΔU + W

A. In an isothermal process ΔU = 0 (temperature constant), so from the first law Q = ΔU + W = W.

B. W = −ΔU describes an adiabatic process (Q = 0), not an isothermal one.

C. In an isothermal process ΔU = 0 and Q = W, not Q = −ΔU.

D. Q = ΔU + W is the general first-law statement, not the isothermal special case (where ΔU = 0).

Question 27 Physics

If a turbine is working as a heat engine and takes that from hot body (427 °C) and exhausts into a body at 77 °C then what is the possible efficiency?

- A. 50% ✓ **Correct answer**
- B. 70%

- D. 95%

A. The Carnot efficiency is 1 − T_cold/T_hot = 1 − 350/700 = 0.50 = 50% (427 °C = 700 K, 77 °C = 350 K).

B. The maximum (Carnot) efficiency is 1 − 350/700 = 50%, not 70%.

C. The maximum efficiency is 50%, not 90%.

D. The maximum efficiency is 50%, not 95%.

Question 28 Physics

Which one of the following is the Boolean expression of NAND gate?

- A. X = A.B
- B. X = A + B
- C. X = A.B (with a bar over A.B) ✓ **Correct answer**
- D. X = A + B (with a bar over A + B)

A. X = A·B (no bar) is the AND gate, not NAND.

B. X = A + B (no bar) is the OR gate, not NAND.

C. NAND is NOT-AND, i.e. X = NOT(A·B), written with a bar over A·B. The Learnospot twin maps its correct text to D (its text matching cannot see the overbars), but the official key (C) and the Boolean definition both give C.

D. A bar over A + B is the NOR gate, not NAND.

Question 29 Physics

Which one of the following is the truth table of NAND gate?

- A. Truth table A B Y — 0 0 1; 0 1 0; 1 0 0; 1 1 0
- B. Truth table A B Y — 0 0 1; 0 1 1; 1 0 1; 1 1 0 ✓ **Correct answer**

- :h table A B Y — 0 1 1; 1 1 0
- D. Truth table A B Y — 0 0 0; 1 1 1

A. This table gives Y = 1 only when A = B = 0, which is the NOR table, not NAND.

B. NAND gives Y = NOT(A·B): 1 except when A = B = 1, exactly this table.

C. This table has only two rows; a two-input truth table needs four rows.

D. This table has only two rows and the wrong outputs for NAND.

Question 30 Physics

If the length, width and separation between the plates of a parallel plate capacitor is doubled then its capacitance becomes:

- A. Double ✓ **Correct answer**
- B. Half
- C. Four-times
- D. Eight-times

A. C = $\varepsilon_0 A/d$: doubling length and width makes the area four times, doubling the separation halves it, so C becomes 4/2 = 2 times.

B. The area quadruples while the separation only doubles, so the capacitance increases, not halves.

C. The area quadruples but the separation also doubles, so the net change is ×2, not ×4.

D. The net change is 4/2 = 2 times, not eight times.

Question 31 Physics

Resistance between two opposite faces of square thin film of area 1 mm^2 having thickness of 1 μm if resistivity of material is 10^{-6} Ω will be:

- A. 1000 Ω

- C. 1 Ω
- D. 10 Ω

No answer is given for this question, and none is taught. DEFECTIVE — excluded as DEFECTIVE, 15 Nov 2026 (decided by assistant under owner's 8 Nov 2026 delegation). The official UHS key marks this question X (cancelled — no answer keyed). The question is ambiguous: read as current flowing through the thickness (the two opposite faces), R = ρL/A = $10^{-6} \times 10^{-6} / 10^{-6} = 10^{-6}$ Ω, which is not offered; read as current flowing along the film, R = $10^{-6} \times 10^{-3} / 10^{-9}$ = 1 Ω (option C, which the Learnospot quiz keys). With two defensible readings giving different answers, no single answer can be taught. This question must never be taught as having an answer.

A. Wrong: neither reading of R = ρL/A gives 1000 Ω.

B. Wrong: neither reading of R = ρL/A gives 100 Ω.

C. The along-the-film reading gives 1 Ω, but the through-the-thickness reading (the faces named in the stem) gives 10^{-6} Ω, so 1 Ω is not uniquely correct.

D. Wrong: neither reading of R = ρL/A gives 10 Ω.

Question 32 Physics

Total resistance between 'A' and 'B' in the given circuit is: [Circuit: A is joined by a 5 Ω resistor to a top rail; three 5 Ω resistors join the top rail to the bottom rail (B) in parallel]

- A. 5.6 Ω
- B. 3.33 Ω
- C. 0.33 Ω
- D. 6.6 Ω ✓ **Correct answer**

A. The three 5 Ω resistors in parallel give 5/3 ≈ 1.67 Ω, in series with 5 Ω: 5 + 1.67 = 6.67 Ω, not 5.6 Ω.

uld be two 5 Ω resistors in parallel plus something else; the circuit gives 6.67 Ω.

C. The parallel combination alone is 1.67 Ω, so the total cannot be 0.33 Ω.

D. Three 5 Ω resistors in parallel = 5/3 ≈ 1.67 Ω; in series with the first 5 Ω resistor the total is 5 + 1.67 = 6.67 ≈ 6.6 Ω.

Question 33 Physics

'F' is maximum force acting on a conductor. Now if we change the direction of conductor by making an angle of 45° with the magnetic field then the force becomes:

- A. F/2
- B. 2F
- C. F/√2 ✓ **Correct answer**
- D. √2 F

A. F = BIL sin θ: at 45°, F = F_max × sin 45° = F/√2, not F/2.

B. At 45° the force is less than the maximum, not twice it.

C. The force is F = BIL sin θ; the maximum (at 90°) is F, so at 45° it is F × sin 45° = F/√2.

D. √2 F exceeds the maximum force, which is impossible.

Question 34 Physics

If we doubled all the parameters of the force acting on current carrying conductor and θ = 90° then magnetic force becomes:

- A. Half
- B. Double
- C. Eight-times ✓ **Correct answer**
- D. Four-times

B, I and L each doubles the force, so it grows, not halves.

B. Doubling all three parameters (B, I, L) gives 2 × 2 × 2 = 8 times, not double.

C. F = BIL sin θ: doubling B, I and L gives 2^3 = 8 times the force (sin 90° = 1).

D. Doubling three parameters gives 2^3 = 8 times, not four times.

Question 35 Physics

The force acting on current carrying conductor will be maximum if the angle between magnetic field and conductor is:

- A. 0°
- B. 30°
- C. 90° ✓ **Correct answer**
- D. 60°

A. At 0° sin θ = 0, so the force is zero, not maximum.

B. At 30° sin θ = 1/2, half the maximum force.

C. F = BIL sin θ is maximum when sin θ = 1, i.e. θ = 90°.

D. At 60° sin θ = √3/2 ≈ 0.87, less than the maximum.

Question 36 Physics

The shadow of the bones in X-rays photographic film appears lighter than the surrounding flesh due to:

- A. Bones reflect greater amount of X-rays
- B. Bones absorb less amount of X-rays
- C. Bones absorb greater amount of X-rays ✓ **Correct answer**
- D. Bones totally reflect X-rays

A. Bones do not reflect X-rays, they absorb them.

official key's answer (B), but it is wrong: if bones absorbed less, more X-rays would reach the film and the bone shadow would be darker, not lighter.

C. Bones (dense, calcium-rich) absorb more X-rays than soft tissue, so fewer X-rays reach the film behind them and the bone shadow is lighter. CORRECTED: the official key (B) is wrong on the physics; the Learnospot quiz and the textbook both give C.

D. Bones do not totally reflect X-rays.

Question 37 Physics

The atom is excited to an energy level E_i from its ground state energy level E_o, the wavelength of the radiations emitted is:

- A. (E_o − E_i)/hc
- B. (E_i − E_o)/hc
- C. hc/(E_i − E_o) ✓ **Correct answer**
- D. E_i/hc − E_o/hc

A. The emitted photon's energy is E_i − E_o (positive), and λ = hc/E, not E/hc.

B. This has the dimensions of 1/length, not length; λ = hc/(E_i − E_o).

C. The photon energy is E = E_i − E_o = hc/λ, so λ = hc/(E_i − E_o).

D. This equals (E_i − E_o)/hc, which has the dimensions of 1/length, not length.

Question 38 Physics

Which one of the following gas is the lasing or active medium in the laser tube?

- A. Hydrogen
- B. Helium
- C. Neon ✓ **Correct answer**
- D. Carbon dioxide

is not the lasing medium of the helium-neon laser.

B. In a helium-neon laser the helium atoms are excited and transfer their energy to the neon atoms; helium is the pumping gas, not the lasing medium. The Learnospot twin keys B, but the official key (C) and the laser physics both give neon.

C. In the He-Ne laser the neon atoms are the active (lasing) medium; the laser transition occurs in neon.

D. Carbon dioxide is the lasing medium of a CO_2 laser, not of a helium-neon laser tube.

Question 39 Physics

The target of X-ray tube is made up of which metal?

- A. Iron
- B. Nickel
- C. Brass
- D. Tungsten ✓ **Correct answer**

A. Iron is not used as an X-ray tube target.

B. Nickel is not used as an X-ray tube target.

C. Brass is not used as an X-ray tube target.

D. The X-ray tube target is tungsten (high atomic number and very high melting point).

Question 40 Physics

The X-rays consists of:

- A. High energy proton
- B. High energy electrons
- C. High energy γ-rays
- D. High energy photons ✓ **Correct answer**

not protons, they carry no charge.

B. X-rays are not electrons; they are produced when electrons strike the target.

C. γ-rays are photons from the nucleus; X-rays are photons from electron transitions and bremsstrahlung, not γ-rays.

D. X-rays are electromagnetic radiation, i.e. high-energy photons.

Question 41 Physics

In Bernoulli's equation the term $\frac{1}{2}\rho v^2$ is called:

- A. K.E. per unit volume ✓ **Correct answer**
- B. K.E.
- C. K.E. per unit area
- D. K.E. per unit length

A. $\frac{1}{2}\rho v^2$ has the dimensions of energy per unit volume (it is the dynamic pressure term in Bernoulli's equation).

B. Kinetic energy itself is $\frac{1}{2}mv^2$, not $\frac{1}{2}\rho v^2$ (which is per unit volume).

C. $\frac{1}{2}\rho v^2$ has dimensions of energy/volume, not energy/area.

D. $\frac{1}{2}\rho v^2$ has dimensions of energy/volume, not energy/length.

Question 42 Physics

Potential energy per unit volume is given by:

- A. mgh
- B. mgh/ρ
- C. gh
- D. ρgh ✓ **Correct answer**

A. mgh is the (total) gravitational potential energy, not per unit volume.

s the dimensions of energy × volume / mass, not energy per unit volume.

C. gh is energy per unit mass, not per unit volume. The Learnospot twin maps its correct text to C, but gh is energy per unit mass; the official key (D) and the dimensions both give ρgh.

D. Potential energy per unit volume = (mgh)/V = ρgh (units of pressure, i.e. energy/volume).

Question 43 Physics

If general equation for destructive interference's is given by the relation, Optic path difference = (m + ½)λ where 'm' is an integer, then first dark fringe appears from 'm' will be equal to:

- A. 2/3
- B. 1/2
- C. 0 ✓ **Correct answer**
- D. 1

A. The first dark fringe is at m = 0 in Δ = (m + ½)λ, not m = 2/3.

B. 1/2 is the fraction in the path-difference formula, not the value of m for the first dark fringe.

C. For destructive interference Δ = (m + ½)λ; the first dark fringe is the smallest, m = 0, giving Δ = λ/2.

D. m = 1 gives the second dark fringe (Δ = 3λ/2), not the first.

Question 44 Physics

For bright fringe formation, the path difference is:

- A. (n + ½)λ where n = 0, 1, 2, ...
- B. nλ where n = 0, 1, 2, ... ✓ **Correct answer**

+ 1)λ/2 where n = 0, 1, 2, ...

- D. ((n + 1)/2)λ² where n = 0, 1, 2, ...

A. (n + ½)λ is the dark-fringe (destructive) condition, not the bright-fringe one.

B. Bright fringes (constructive interference) occur when the path difference is a whole number of wavelengths, nλ.

C. (2n + 1)λ/2 = (n + ½)λ is the dark-fringe condition, not the bright-fringe one.

D. λ² has the wrong dimensions for a path difference.

Question 45 Chemistry

Which one of the following is structural formula of proline? [Structures: A) a five-membered ring with NH and a COOH group; B) H3C—HC—CH—COOH with CH3 and NH2 groups; C) H3C—CH(NH2)—COOH; D) HOOC—CH2—CH(NH2)—COOH]

- A. Cyclic structure: five-membered ring with NH and COOH (proline) ✓ **Correct answer**
- B. H3C—HC—CH—COOH with CH3 and NH2 (isoleucine)
- C. H3C—CH(NH2)—COOH (alanine)
- D. HOOC—CH2—CH(NH2)—COOH (aspartic acid)

A. Proline is the only amino acid whose side chain loops back to the nitrogen, forming a five-membered (pyrrolidine) ring.

B. This open-chain structure is isoleucine, not proline.

C. This is alanine, not proline.

D. This is aspartic acid, not proline.

Question 46 Chemistry

In the formation of Zwitter ion which one of the following donates the proton?

- OH ✓ Correct answer
- B. NH2
- C. $CH2COO^{-}$
- D. OH^{-}

A. In zwitterion formation the carboxyl group (–COOH) donates its proton to the amino group (–NH2), giving $–COO^{-}$ and $–NH3^{+}$.

B. The amino group accepts the proton; it does not donate it.

C. The carboxylate ion has already lost its proton; it cannot donate one.

D. The hydroxide ion is not part of the amino acid's zwitterion formation.

Question 47 Chemistry

[Structural formula: HOOC—CH2—CH2—CH(NH2)—COOH] What is the name of above given structural formula?

- A. Aspartic Acid
- B. Asparagine
- C. Adipic Acid
- D. Glutamic Acid ✓ **Correct answer**

A. Aspartic acid is HOOC—CH2—CH(NH2)—COOH (one CH2 fewer than the structure shown).

B. Asparagine is the amide of aspartic acid (HOOC—CH2—CH(NH2)—CONH2), not the structure shown.

C. Adipic acid is HOOC—(CH2)4—COOH, a dicarboxylic acid with no amino group.

D. HOOC—CH2—CH2—CH(NH2)—COOH is glutamic acid (2-aminopentanedioic acid).

48 Chemistry

Which one of the following is simplest amino acid?

- A. Lysine
- B. Leucine
- C. Alanine
- D. Glycine ✓ **Correct answer**

A. Lysine has a long (CH2)4NH2 side chain; it is not the simplest amino acid.

B. Leucine has an isobutyl side chain; it is not the simplest amino acid.

C. Alanine has a CH3 side chain; glycine (side chain H) is simpler.

D. Glycine's side chain is a single hydrogen atom, making it the simplest amino acid.

Question 49 Chemistry

Which one of the following polymer is called as Nylon 6,6?

- A. Polyester
- B. Polyvinyl chloride
- C. Polyamide ✓ **Correct answer**
- D. Polyvinyl acetate

A. Nylon 6,6 is a polyamide, not a polyester (polyesters have ester linkages).

B. Polyvinyl chloride (PVC) is a vinyl polymer, not Nylon 6,6.

C. Nylon 6,6 is a polyamide (it has amide —CONH— linkages, made from hexamethylenediamine and adipic acid).

D. Polyvinyl acetate is a vinyl polymer, not Nylon 6,6.

50 Chemistry

Which one of the following is an exact composition of a carbohydrates?

- A. Carbon and Hydrogen
- B. Carbon and Oxygen
- C. Carbon, Hydrogen and Oxygen ✓ **Correct answer**
- D. Hydrogen and Oxygen

A. Carbohydrates also contain oxygen.

B. Carbohydrates also contain hydrogen.

C. Carbohydrates are composed of carbon, hydrogen and oxygen (general formula Cx(H2O)y).

D. Carbohydrates also contain carbon.

Question 51 Chemistry

Which one of the following nitrogen base is NOT present in DNA?

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

A. Adenine is present in DNA.

B. Guanine is present in DNA.

C. Uracil replaces thymine in RNA; it is NOT present in DNA.

D. Cytosine is present in DNA.

52 Chemistry

In the woody parts of trees, the %age of cellulose is:

- A. 50% ✓ **Correct answer**
- B. 10%
- C. 30%
- D. 100%

A. Wood is about 50% cellulose (the rest is mainly hemicellulose and lignin). CORRECTED: the official key (D, 100%) is wrong — no wood is 100% cellulose; the Learnospot quiz and the textbook both give 50%.

B. Wood is about 50% cellulose, not 10%.

C. Wood is about 50% cellulose, not 30%.

D. This is the official key's answer, but wood also contains lignin and hemicellulose, so it cannot be 100% cellulose.

Question 53 Chemistry

[Lewis dot diagram: a hydrogen atom (one valence electron) and a larger atom with five valence electrons combine to form a molecule with a central atom bonded to three hydrogen atoms] Choose the right molecule.

- A. CH3
- B. CO
- C. H2O
- D. NH3 ✓ **Correct answer**

A. The diagram shows a central atom bonded to three hydrogen atoms, not a methyl radical.

B. The diagram shows a central atom bonded to three hydrogens, not carbon monoxide.

am's product has three hydrogens on the central atom (water has two).

D. The diagram shows a nitrogen atom (five valence electrons) sharing electrons with three hydrogen atoms, forming ammonia.

Question 54 Chemistry

[Structural formula: a polymer repeat unit —[CO—C6H4—CO—O—CH2—CH2—O]—n, with a benzene ring and ester linkages] Indicate the name of above given structure.

- A. Nylon 6,6
- B. Adipic Acid
- C. PVA
- D. Polyester ✓ **Correct answer**

A. Nylon 6,6 is a polyamide (amide linkages), not the ester-linked structure shown.

B. Adipic acid is a monomer (HOOC—(CH2)4—COOH), not this polymer.

C. This is the official key's answer, but PVA (polyvinyl alcohol) has no benzene ring and no ester linkages; the structure shown is not PVA.

D. The repeat unit —CO—C6H4—CO—O—CH2—CH2—O— is poly(ethylene terephthalate) (PET), a polyester (ester linkages). CORRECTED: the official key (C) is wrong; the Learnospot quiz and the structure both give polyester.

Question 55 Chemistry

In laboratory experiment an unknown compound was added in test tube containing iodine, the colour became intense blue. What could be the unknown compound?

- A. Cellulose
- B. Raffinose
- C. Ribose
- D. Starch ✓ **Correct answer**

does not give the intense blue colour with iodine.

B. Raffinose does not give the intense blue colour with iodine.

C. Ribose does not give the intense blue colour with iodine.

D. Starch (amylose) forms an intense blue-black complex with iodine.

Question 56 Chemistry

Ozone concentration is measured in:

- A. Debye units
- B. Dupont units
- C. Debacle units
- D. Dobson units ✓ **Correct answer**

A. The debye is a unit of electric dipole moment, not of ozone concentration.

B. There is no "Dupont unit" for ozone concentration.

C. There is no "Debacle unit" for ozone concentration.

D. Total-column ozone is measured in Dobson units (DU).

Question 57 Chemistry

The gas which is mainly produced in landfills from the waste is:

- A. CH_4 ✓ **Correct answer**
- B. CO_2
- C. SO_2
- D. Cl_2

A. Anaerobic decomposition of waste in landfills produces mainly methane (landfill gas is roughly half methane, half carbon dioxide, with methane the main fuel gas).

oxide is also produced, but methane is the main landfill gas named in the textbook.

C. Sulphur dioxide is not the main landfill gas.

D. Chlorine is not produced in landfills.

Question 58 Chemistry

The substance for the separation of isotopes is firstly converted into the:

- A. Neutral state
- B. Free state
- C. Vapour state ✓ **Correct answer**
- D. Charged state

A. Isotope separation (e.g. in a mass spectrometer) first requires the substance as a vapour.

B. "Free state" is not the required first conversion for isotope separation.

C. For mass-spectrometric isotope separation the substance is first vaporised (then ionised).

D. Charging (ionisation) comes after vaporisation, not first.

Question 59 Chemistry

The number of moles of CO2 which contain 8.00 gm of oxygen is:

- A. 0.75
- B. 1.50
- C. 0.25 ✓ **Correct answer**
- D. 1.00

A. One mole of CO2 contains 32 g of oxygen; 8 g is 8/32 = 0.25 mol, not 0.75.

gen is 8/32 = 0.25 mol of CO_2, not 1.50.

C. Each mole of CO_2 carries 2 × 16 = 32 g of oxygen, so 8.00 g of oxygen is 8/32 = 0.25 mol of CO_2.

D. One mole of CO_2 contains 32 g of oxygen, not 8 g.

Question 60 Chemistry

London dispersion forces are the only forces present among the:

- A. Molecules of H_2O in liquid state
- B. Molecules of HCl gas
- C. Atoms of helium in gaseous state at high temperature ✓ **Correct answer**
- D. Molecules of solid chlorine

A. Water molecules also have hydrogen bonding and dipole-dipole forces, not only dispersion forces.

B. HCl molecules are polar, so dipole-dipole forces act as well as dispersion forces.

C. Helium atoms are non-polar, so London dispersion forces are the only intermolecular forces between them — the textbook's canonical example, and the official key's answer. Note: solid chlorine (D) is also non-polar, so it too has only dispersion forces; the question's intended (and keyed) answer is the helium case.

D. Chlorine molecules are non-polar and also have only dispersion forces; the official key nevertheless gives C (helium), the textbook's standard example.

Question 61 Chemistry

Electrical conductivity of graphite is greater in one direction that in other due to:

- A. Isomorphism
- B. Cleavage plane
- C. Anisotropy ✓ **Correct answer**

A. Isomorphism (same crystal form) does not explain graphite's directional conductivity.

B. The cleavage plane is where graphite splits; it is not the reason for directional conductivity.

C. Graphite's properties differ with direction (delocalised electrons move freely within layers but not between them) — anisotropy.

D. Symmetry does not explain directional conductivity.

Question 62 Chemistry

Number of neutrons in $^{66}_{30}Zn$ will be:

- A. 30
- B. 35
- C. 38
- D. 36 ✓ **Correct answer**

A. 30 is the atomic number (protons), not the neutron number.

B. Neutrons = mass number − atomic number = 66 − 30 = 36, not 35.

C. Neutrons = 66 − 30 = 36, not 38.

D. Neutrons = 66 − 30 = 36.

Question 63 Chemistry

The maximum number of electrons in electronic configuration can be calculated by using formula:

- A. 2l + 1
- B. $2n^2 + 2$
- C. $2n^2$ ✓ **Correct answer**

A. 2l + 1 is the number of orbitals in a subshell, not the maximum electrons in a shell.

B. The maximum electrons in shell n is $2n^2$, not $2n^2 + 2$.

C. The maximum number of electrons in the nth shell is $2n^2$.

D. The maximum electrons in shell n is $2n^2$, not $2n^2 + 1$.

Question 64 Chemistry

[Structural formula: H2C=CH2 (ethene), with a C=C double bond and four C—H bonds]

Calculate the number of σ bonds and π bonds in the molecule.

- A. 1π and 5σ bonds ✓ **Correct answer**
- B. 2π and 4σ bonds
- C. 3π and 3σ bonds
- D. 6π and 6σ bonds

A. Ethene (C2H4) has four C—H σ bonds, one C—C σ bond and one C—C π bond: 5σ and 1π.

B. Ethene has only one π bond (the second bond of the C=C double bond).

C. Ethene has 5σ and 1π bonds, not 3σ and 3π.

D. Ethene has 5σ and 1π bonds, not 6σ and 6π.

Question 65 Chemistry

$\frac{1}{2}H_2(g) \longrightarrow H(g)$ $\Delta H = 218\ kJmol^{-1}$ In this reaction, ΔH will be called:

- A. Enthalpy of atomization ✓ **Correct answer**
- B. Enthalpy of decomposition
- C. Enthalpy of formation
- D. Enthalpy of the dissociation

ersion of half a mole of H2 molecules into H atoms is atomization; 218 kJ/mol is the enthalpy of atomization of hydrogen.

B. Decomposition breaks a compound into simpler substances; here a molecule is split into atoms.

C. Formation enthalpy is for forming a compound from its elements, not for splitting H2 into atoms.

D. Dissociation enthalpy is for splitting a molecule into atoms, but the standard term for forming gaseous atoms from the element is the enthalpy of atomization.

Question 66 Chemistry

Mg + ½O2(g) ⟶ MgO(g) + -692 $kJmol^{-1}$ at STP. Enthalpy of the above reaction will be called:

- A. ΔH°at
- B. ΔH°s
- C. ΔH°sol
- D. ΔH°f ✓ **Correct answer**

A. ΔH°at is the enthalpy of atomization, not of forming MgO from its elements.

B. ΔH°s is the enthalpy of sublimation, not of forming MgO.

C. ΔH°sol is the enthalpy of solution, not of forming MgO.

D. MgO is formed from its elements (Mg and O2) in their standard states, so the enthalpy change is the standard enthalpy of formation, ΔH°f.

Question 67 Chemistry

Freezing point will also be defined as that temperature at which its solid and liquid phases have the same:

centration

- B. Ratio between the particles
- C. Vapour pressure ✓ **Correct answer**
- D. Attraction between the phases

A. The freezing point is not defined by the phases having the same concentration.

B. The freezing point is not defined by a ratio between the particles.

C. At the freezing point the solid and liquid phases are in equilibrium, so they have the same vapour pressure.

D. The freezing point is not defined by the attraction between the phases.

Question 68 Chemistry

What mass of NaOH is present in 0.5 mol of sodium hydroxide?

- A. 40 gm
- B. 2.5 gm
- C. 15 gm
- D. 20 gm ✓ **Correct answer**

A. 40 g is the mass of 1 mol of NaOH (molar mass 40 g/mol), not 0.5 mol.

B. 0.5 mol × 40 g/mol = 20 g, not 2.5 g.

C. 0.5 mol × 40 g/mol = 20 g, not 15 g.

D. Molar mass of NaOH = 40 g/mol, so 0.5 mol = 0.5 × 40 = 20 g.

Question 69 Chemistry

[Diagram: a galvanic cell with a copper electrode in 1M CuSO4 solution and a hydrogen electrode in 1M HCl solution, separated by a porous partition, with a voltmeter across the electrodes] The diagram shows a galvanic cell. The current will flow from:

rogen electrode to copper electrode ✓ **Correct answer**

- B. Copper electrode to hydrogen electrode
- C. Hydrogen electrode to HCl solution
- D. CuSO4 solution to hydrogen electrode

A. The hydrogen electrode is the anode (oxidation: $H2 \rightarrow 2H^{+} + 2e^{-}$) and the copper electrode is the cathode (reduction: $Cu^{2+} + 2e^{-} \rightarrow Cu$), so electrons flow from the hydrogen electrode to the copper electrode through the external circuit (conventional current flows the opposite way).

B. This is the direction of conventional current, not of the electron flow the question asks for; the official key and the Learnospot quiz both give A.

C. Current does not flow from the electrode into its own solution in this sense.

D. Current does not flow from the CuSO4 solution to the hydrogen electrode.

Question 70 Chemistry

Study the following redox reaction: $10Cl^{-} + 16H^{+} + 2MnO4^{-} \longrightarrow 5Cl2 + 2Mn^{+2} + 8H2O$

- A. Manganese is oxidized from +7 to +2
- B. Chlorine ions are reduced from -1 to zero
- C. Chlorine is reduced from zero to -1
- D. Manganese is reduced from +7 to +2 ✓ **Correct answer**

A. Going from +7 to +2 is a gain of electrons, i.e. reduction, not oxidation.

B. Chloride ions go from −1 to 0 in Cl2, losing electrons: that is oxidation, not reduction.

C. Chlorine goes from −1 (in Cl^{-}) to 0 (in Cl2); it is oxidized, not reduced, and the direction is wrong.

D. In $MnO4^{-}$ manganese is +7; in Mn^{2+} it is +2 — a gain of 5 electrons, i.e. reduction.

71 Chemistry

Human blood maintains its pH between:

- A. 6.50 - 7.00
- B. 7.20 - 7.25
- C. 7.50 - 7.55
- D. 7.35 - 7.40 ✓ **Correct answer**

A. Human blood pH is about 7.4, not 6.50–7.00 (that would be acidic).

B. Human blood pH is 7.35–7.45, so 7.20–7.25 is too low.

C. Human blood pH is 7.35–7.45, so 7.50–7.55 is too high.

D. Human blood pH is maintained at about 7.35–7.45 (the textbook figure is 7.35–7.40).

Question 72 Chemistry

Value of Ksp for PbSO4 system at 25 °C is equal to:

- A. 1.6 x 10^{-5} mol^2dm^{-6}
- B. 1.6 x 10^{-6} mol^2dm^{-6}
- C. 1.6 x 10^{-8} mol^2dm^{-6} ✓ **Correct answer**
- D. 1.6 x 10^{-7} mol^2dm^{-6}

A. The textbook Ksp of PbSO4 is 1.6 × 10^{-8} mol^2dm^{-6}, not 1.6 × 10^{-5}.

B. The textbook Ksp of PbSO4 is 1.6 × 10^{-8} mol^2dm^{-6}, not 1.6 × 10^{-6}.

C. The solubility product of lead(II) sulphate at 25 °C is 1.6 × 10^{-8} mol^2dm^{-6}.

D. The textbook Ksp of PbSO4 is 1.6 × 10^{-8} mol^2dm^{-6}, not 1.6 × 10^{-7}.

Question 73 Chemistry

2A + B ⟶ Product If the reactant 'B' is in excess, the order of reaction with respect to 'A'

e law, Rate = k[A] [B] is:

- A. 2nd order reaction ✓ **Correct answer**
- B. 1st order reaction
- C. Pseudo 1st order reaction
- D. 3rd order reaction

A. The rate law is Rate = $k[A]^2[B]$, so the order with respect to A is the exponent of [A], which is 2.

B. The exponent of [A] in the rate law is 2, not 1.

C. "Pseudo first order" describes the overall behaviour when B is in excess (the rate then depends only on $[A]^2$, i.e. pseudo second order); the question asks the order with respect to A, which is 2.

D. The overall order is 3 (2 + 1), but the order with respect to A alone is 2.

Question 74 Chemistry

The rate constant 'k' is 0.693 min^{-1}. The half-life for the 1st order reaction will be:

- A. 1 min ✓ **Correct answer**
- B. 2 min
- C. 0.693 min
- D. 4 min

A. For a first-order reaction $t_{½} = 0.693/k = 0.693/0.693 = 1$ min.

B. $t_{½} = 0.693/k = 0.693/0.693 = 1$ min, not 2 min.

C. 0.693 is the value of k × $t_{½}$, not $t_{½}$ itself.

D. $t_{½} = 0.693/k = 1$ min, not 4 min.

75 Chemistry

Melting points of group II-A elements are higher than those of group I-A because:

- A. Atoms of II-A elements have smaller size
- B. II-A elements are more reactive
- C. Atoms of II-A elements provide two binding electrons ✓ **Correct answer**
- D. I-A elements have smaller atomic radius

A. Smaller size is not the reason for the higher melting points of group II-A elements.

B. Group II-A elements are less reactive than group I-A elements, and reactivity does not explain melting points.

C. Each group II-A atom contributes two valence electrons to the metallic bond, making the metallic bonding stronger and the melting points higher than in group I-A.

D. Group I-A elements have larger atomic radii than group II-A elements, and radius alone is not the reason.

Question 76 Chemistry

The ionic radius of fluoride ion is:

- A. 72 pm
- B. 95 pm
- C. 136 pm ✓ **Correct answer**
- D. 157 pm

A. 72 pm is the atomic (covalent) radius of fluorine, not the ionic radius of F^-.

B. The ionic radius of F^- is 136 pm, not 95 pm.

C. The ionic radius of the fluoride ion (F^-) is 136 pm.

D. The ionic radius of F^- is 136 pm, not 157 pm.

77 Chemistry

2NaOH(aq) + Cl2(g) ⟶ NaCl + NaClO + H2O proceed at:

- A. 500 °C
- B. 200 °C
- C. -10 °C
- D. 15 °C ✓ **Correct answer**

A. Chlorine with cold dilute NaOH gives NaCl + NaClO; at high temperature (hot concentrated NaOH) it gives NaClO3 instead.

B. At 200 °C the reaction gives chlorate (NaClO3), not hypochlorite.

C. The reaction with cold dilute NaOH is carried out at about 15 °C, not −10 °C.

D. Chlorine reacts with cold dilute NaOH (about 15 °C) to give NaCl + NaClO + H2O.

Question 78 Chemistry

Which halogen molecule 'X2' has lowest dissociation energy?

- A. Cl2
- B. Br2
- C. I2
- D. F2 ✓ **Correct answer**

A. The Cl–Cl bond dissociation energy (242 kJ/mol) is the highest among the halogens, not the lowest.

B. The Br–Br bond dissociation energy (193 kJ/mol) is higher than that of F2 as taught in the textbook.

C. The measured I–I bond dissociation energy is about 151 kJ/mol, marginally below F2's 158 kJ/mol; the Learnospot quiz keys I2 on the measured data. The official key nevertheless gives F2, following the textbook's discussion of fluorine's anomalously low

energy (lone-pair repulsion in the small F2 molecule), and that is the answer UHS awarded.

D. The textbook teaches that fluorine's dissociation energy is anomalously low among the halogens, and the official key gives F2.

Question 79 Chemistry

The anomalous electronic configuration shown by chromium and copper among 3-d series of elements is due to:

- A. Colour of ions of these metals
- B. Variable oxidation states of metals
- C. Stability associated with this configuration ✓ **Correct answer**
- D. Complex formation tendency of metals

A. Colour is a consequence of the d-electron arrangement, not the reason for the anomalous configurations.

B. Variable oxidation states do not cause the anomalous configurations.

C. Chromium ($3d^5 4s^1$) and copper ($3d^{10} 4s^1$) adopt these configurations because a half-filled or fully-filled d subshell is extra stable.

D. Complex formation does not cause the anomalous configurations.

Question 80 Chemistry

Which element of 3d series of periodic table shows the electronic configuration of $3d^6$, $4s^2$?

- A. Copper
- B. Cobalt
- C. Zinc
- D. Nickel ✓ **Correct answer**

3d⁴4s², not 3d⁴4s².

B. Cobalt is $3d^7 4s^2$, not $3d^6 4s^2$.

C. Zinc is $3d^{10} 4s^2$, not $3d^6 4s^2$.

D. Nickel is $3d^8 4s^2$. Note: the stem prints $3d^6$, $4s^2$, which is iron's configuration — and iron is not among the options — so the stem's "6" is evidently a misprint for "8"; the official key and the Learnospot quiz both give Nickel ($3d^8 4s^2$).

Question 81 Chemistry

The %age of nitrogen in ammonium nitrate is:

- A. 46%
- B. 82%
- C. 33% ✓ **Correct answer**
- D. 13%

A. 46% is the nitrogen content of urea, not of ammonium nitrate.

B. Ammonium nitrate is 35% nitrogen by mass, not 82%.

C. The exact value is 28/80 = 35% (NH4NO3, molar mass 80 g/mol, nitrogen mass 28 g/mol), which is not offered; 33% is the closest option and the answer both the official key and the Learnospot quiz give.

D. Ammonium nitrate is 35% nitrogen by mass, not 13%.

Question 82 Chemistry

Which one of the following is anhydride of sulphuric acid?

- A. Sulphur (II) oxide
- B. Sulphur (VI) oxide
- C. Iron pyrite

ohur (VI) oxide ✓ **Correct answer**

A. Sulphur(II) oxide (SO) is not the anhydride of sulphuric acid.

B. The paper prints "Sulphur (VI) oxide" at both B and D; SO3 (sulphur(VI) oxide) is the anhydride of H2SO4, so this option is the same substance as the keyed answer.

C. Iron pyrite (FeS2) is not the anhydride of sulphuric acid.

D. SO3 is the anhydride of sulphuric acid (SO3 + H2O → H2SO4); the official key gives D. (The paper duplicates this option at B; the substance is the same either way.)

Question 83 Chemistry

During contact process of H2SO4 synthesis, the following reaction occurs: $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$ $\Delta H = -96\ kJmol^{-1}$ Which step is used to increase the yield of SO3?

- A. Temperature is raised to very high degree
- B. SO3 formed is removed very quickly
- C. Both temperature and pressure are kept very low
- D. An excess of air is used to drive the equilibrium to the right side ✓ **Correct answer**

A. The reaction is exothermic, so raising the temperature shifts the equilibrium to the left and lowers the SO3 yield.

B. Removing SO3 would shift the equilibrium right, but in the contact process the yield is raised by using excess air (oxygen); the standard textbook answer is D.

C. Low pressure would shift the equilibrium left (fewer moles on the right); a moderately high pressure is used.

D. Excess oxygen (from air) drives the equilibrium $2SO_2 + O_2 \rightleftharpoons 2SO_3$ to the right, increasing the SO3 yield.

84 Chemistry

Synthesis of ammonia by Haber's process is a reversible reaction. What should be done to increase the yield of ammonia in the following reaction? $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ $\Delta H = -92\ kJmol^{-1}$

- A. Pressure should be decreased
- B. Ammonia should remain in reaction mixture
- C. Pressure should be increased ✓ **Correct answer**
- D. Concentration of nitrogen should be decreased

A. The reaction goes from 4 moles of gas to 2, so decreasing the pressure shifts the equilibrium left and lowers the yield.

B. Removing ammonia (not keeping it) would shift the equilibrium right.

C. The forward reaction reduces the number of gas moles (4 → 2), so increasing the pressure shifts the equilibrium right and increases the ammonia yield.

D. Decreasing a reactant's concentration shifts the equilibrium left and lowers the yield.

Question 85 Chemistry

Which one of the following reactions shows combustion of a saturated hydrocarbon?

- A. $C_2H_4 + 3O_2 \longrightarrow 2CO_2 + 2H_2O$
- B. $CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$ ✓ **Correct answer**
- C. $CH_4 + ½O_2 \xrightarrow{Cu,\ 400°C,\ 200\ atm} CH_3OH$
- D. $C_2H_2 + 5/2\ O_2 \longrightarrow 2CO_2 + H_2O$

A. C_2H_4 (ethene) is an unsaturated hydrocarbon (alkene), so this is not the combustion of a saturated hydrocarbon.

B. CH_4 (methane) is a saturated hydrocarbon (alkane), and this is its complete combustion.

partial oxidation of methane to methanol, not combustion.

D. C2H2 (ethyne) is an unsaturated hydrocarbon (alkyne), so this is not the combustion of a saturated hydrocarbon.

Question 86 Chemistry

Skeletal formula of an organic compound is given below: [Skeletal formula: CH3—CH2—C(CH3)=C(CH3)—CH2—CH3, a hex-3-ene with a methyl group on each carbon of the double bond] It is a hydrocarbon. IUPAC name of the compound is:

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

A. The skeletal formula has one methyl group on C3 and one on C4, not two methyl groups on C3.

B. The longest chain is six carbons with the double bond at C3, and each double-bond carbon carries a methyl group: 3,4-dimethyl-3-hexene.

C. The compound has two methyl substituents, so it is not unsubstituted 3-hexene.

D. The double bond is at C3, not C1, and the methyl groups are at C3 and C4.

Question 87 Chemistry

Which one of the following pairs can be cis-trans isomer to each other?

- A. CHCl=CCl2 and CH2=CH2
- B. CHCl=CH2 and CH2=CHCl
- C. CH3–CH=CH–CH3 and H3C–CH=CH–CH3 ✓ **Correct answer**
- D. CH3–CH3 and CH2=CH2

A. These are two different compounds, not cis-trans isomers of each other.

the same compound (chloroethene) written two ways, not cis-trans isomers.

C. These are the cis and trans forms of but-2-ene (the two CH3 groups on the same side, and on opposite sides, of the C=C bond).

D. Ethane and ethene are different compounds, not cis-trans isomers.

Question 88 Chemistry

Consider the reaction given below: $CH_3CH_2Br \xrightarrow{KOH,\ alcohol} H_2C=CH_2 + HBr$

Mechanism followed by the reaction is:

- A. E2 ✓ **Correct answer**
- B. E1
- C. SN1
- D. SN2

A. Dehydrohalogenation of a primary alkyl halide with alcoholic KOH is a bimolecular elimination (E2).

B. E1 is a unimolecular elimination (via a carbocation); ethyl bromide with alcoholic KOH follows E2.

C. SN1 is a substitution mechanism, but this reaction is an elimination (ethene is formed).

D. SN2 is a substitution mechanism, but this reaction is an elimination (ethene is formed).

Question 89 Chemistry

The average bond energy of C-Br is:

- A. 228 $kJmol^{-1}$
- B. 200 $kJmol^{-1}$
- C. 250 $kJmol^{-1}$
- D. 290 $kJmol^{-1}$ ✓ **Correct answer**

ook average bond energy of C–Br is 290 kJ/mol, not 228.

B. The textbook average bond energy of C–Br is 290 kJ/mol, not 200.

C. The textbook average bond energy of C–Br is 290 kJ/mol, not 250.

D. The average bond energy of the C–Br bond is 290 kJ/mol.

Question 90 Chemistry

Which one of the following is NOT a nucleophile:

- A. $NH2^-$
- B. H2O
- C. BF3 ✓ **Correct answer**
- D. $CH3^-$

A. The amide ion is a nucleophile (it donates an electron pair).

B. Water is a (weak) nucleophile (it donates a lone pair).

C. BF3 is electron-deficient (an electrophile / Lewis acid), not a nucleophile.

D. The methyl anion is a nucleophile (it donates an electron pair).

Question 91 Chemistry

Which one of the following is an appropriate indication of positive iodoform test?

- A. Formation of H2O
- B. Release of H2 gas
- C. Brick red precipitate
- D. Yellow crystal ✓ **Correct answer**

A. Water is not the indication of a positive iodoform test.

B. No hydrogen gas is released in the iodoform test.

d precipitate is the indication of Fehling's test, not the iodoform test.

D. A positive iodoform test gives yellow crystals of iodoform (CHI3).

Question 92 Chemistry

[Structural formula: (CH3)3C—OH — a central carbon bonded to three CH3 groups and one OH group] Which one of the following is the proper classification of above formula:

- A. Primary
- B. Secondary
- C. Tertiary ✓ **Correct answer**
- D. Polyhydride

A. The carbon bearing the OH group is bonded to three other carbons, not one, so it is not a primary alcohol.

B. The carbon bearing the OH group is bonded to three other carbons, not two, so it is not a secondary alcohol.

C. The OH-bearing carbon is attached to three carbon atoms, so this is a tertiary alcohol (tert-butyl alcohol).

D. "Polyhydride" is not a classification of alcohols; the compound has a single OH group.

Question 93 Chemistry

Which one of the following is an appropriate structure of product of bromination? [Four bromophenol structures: A) 2,3,4-tribromophenol; B) 2-bromophenol; C) 2,4,6-tribromophenol; D) 2,3,6-tribromophenol]

- A. 2,3,4-Tribromophenol
- B. 2-Bromophenol
- C. 2,4,6-Tribromophenol ✓ **Correct answer**
- D. 2,3,6-Tribromophenol

on of phenol substitutes at the ortho and para positions (2, 4 and 6), not at 2, 3 and 4.

B. Bromination of phenol with bromine water gives the tribromo product, not the monobromo product.

C. Phenol is highly activated, and bromination (bromine water) gives 2,4,6-tribromophenol as a white precipitate.

D. Bromination of phenol substitutes at the ortho and para positions (2, 4 and 6), not at 2, 3 and 6.

Question 94 Chemistry

[Structural formula: a benzene ring with OH at the top and NO2 groups at the 2, 4 and 6 positions] Which one of the following is an appropriate name of above compound?

- A. 1,3,6-Trinitrophenol
- B. m-Nitrophenol
- C. Tartaric acid
- D. Picric acid ✓ **Correct answer**

A. The compound is 2,4,6-trinitrophenol (the NO2 groups are ortho and para to the OH), not 1,3,6-trinitrophenol; the Learnospot twin keys A, but the name is wrong and the official key (D) is right.

B. The compound has three nitro groups, not one, so it is not m-nitrophenol.

C. The compound is a nitrated phenol, not tartaric acid.

D. 2,4,6-Trinitrophenol is picric acid.

Question 95 Chemistry

[Structural formula: (CH3)2C=N—NH—C6H3(NO2)2, the condensation product of acetone

itrophenylhydrazine] It is the general formula of:

- A. 2, 4-Dinitrophenyl hydrazine
- B. 1, 3-Dinitrophenyl hydrazone
- C. Phenyl hydrazone
- D. 2, 4-Dinitrophenyl hydrazone ✓ **Correct answer**

A. 2,4-Dinitrophenylhydrazine is the reagent (H2N—NH—C6H3(NO2)2); the structure shown is its condensation product with acetone (a hydrazone, with C=N).

B. The nitro groups are at the 2 and 4 positions of the phenyl ring, not 1 and 3.

C. The phenyl ring carries two nitro groups, so it is a 2,4-dinitrophenyl hydrazone, not a plain phenyl hydrazone.

D. The structure is the hydrazone formed from acetone and 2,4-dinitrophenylhydrazine (the 2,4-DNPH derivative of acetone).

Question 96 Chemistry

[Structural formula: H—C(=O)—H (formaldehyde)] Which one of the following is the IUPAC name of above given structure:

- A. Propionaldehyde
- B. Methanone
- C. Acetaldehyde
- D. Methanal ✓ **Correct answer**

A. Propionaldehyde is CH3CH2CHO (three carbons), not HCHO.

B. "Methanone" is not a valid name; the aldehyde HCHO is methanal.

C. Acetaldehyde is CH3CHO (two carbons), not HCHO.

D. HCHO is methanal (formaldehyde).

97 Chemistry

Which one of the following test is given by both aldehyde and ketone?

- A. Silver mirror test
- B. Fehling's solution test
- C. 2, 4 DNPH test ✓ **Correct answer**
- D. Benedict's solution test

A. Tollens' reagent (silver mirror test) is given by aldehydes only, not by ketones.

B. Fehling's solution is reduced by aldehydes only, not by ketones.

C. 2,4-Dinitrophenylhydrazine reacts with the carbonyl group of both aldehydes and ketones, giving an orange precipitate.

D. Benedict's solution is reduced by aldehydes only, not by ketones.

Question 98 Chemistry

$CH_3COOH + CH_3CH_2OH \rightleftharpoons CH_3COOC_2H_5 + H_2O$ Which one of the following will act as a catalyst in above reaction?

- A. HNO_3
- B. H_2SO_4 ✓ **Correct answer**
- C. Acidified potassium dichromate
- D. $SOCl_2$

A. Nitric acid is not the catalyst used for esterification.

B. Concentrated sulphuric acid catalyses the esterification of acetic acid with ethanol (and absorbs the water formed).

C. Acidified potassium dichromate is an oxidising agent, not the esterification catalyst.

D. Thionyl chloride converts carboxylic acids to acyl chlorides; it is not the esterification catalyst.

99 Chemistry

$CH_3COOH + PCl_5 \longrightarrow ?$ Which one of the following options shows the products of above reaction?

- A. $POCl_2 + CH_3COCl_2 + HCl$
- B. $POCl_3 + CH_3COCl_2 + H_2$
- C. $CH_3COCl + POCl_2 + HCl$
- D. $POCl_3 + CH_3COCl + HCl$ ✓ **Correct answer**

A. The reaction gives $POCl_3$ (not $POCl_2$) and acetyl chloride CH_3COCl (not CH_3COCl_2).

B. The products are $CH_3COCl + POCl_3 + HCl$; no H_2 is formed and the acyl chloride is CH_3COCl.

C. The phosphorus product is $POCl_3$, not $POCl_2$.

D. Acetic acid with PCl_5 gives acetyl chloride, phosphorus oxychloride and hydrogen chloride: $CH_3COOH + PCl_5 \rightarrow CH_3COCl + POCl_3 + HCl$.

Question 100 Chemistry

Which one of the following reaction of carboxylic acid is reversible?

- A. Esterification ✓ **Correct answer**
- B. Salt formation
- C. Reaction with PCl_5
- D. Reaction with $SOCl_2$

A. Esterification ($RCOOH + R'OH \rightleftharpoons RCOOR' + H_2O$) is a reversible reaction.

B. Salt formation of a carboxylic acid with a base is not reversible in this sense.

C. The reaction with PCl_5 to give the acyl chloride is not reversible.

D. The reaction with $SOCl_2$ to give the acyl chloride is not reversible.

101 Chemistry

[Structural formula: R—C(H)(NH_3^+)—COO^-, an amino acid in its zwitterionic form] Select the best option indicating the name of the above structure:

- A. Cation
- B. Neutral amino acid
- C. Internal salt ✓ **Correct answer**
- D. Anion

A. The structure carries both a positive (NH_3^+) and a negative (COO^-) charge, so it is not a cation.

B. The uncharged form would be R—CH(NH_2)—COOH; this structure has NH_3^+ and COO^-, so it is the zwitterion (internal salt).

C. The amino acid exists as a zwitterion (NH_3^+ and COO^- in the same molecule), which is called an internal salt.

D. The structure carries both charges, so it is not an anion.

Question 102 Chemistry

When acid is added to an amino acid, which one of the following will act as a base?

- A. NH_3^+
- B. COO^- ✓ **Correct answer**
- C. H^+
- D. R group

A. NH_3^+ is already protonated; it cannot act as a base.

B. The carboxylate group (COO^-) accepts a proton from the added acid, acting as a base.

C. H^+ is an acid, not a base.

D. The R (side-chain) group does not act as a base here.

103 English

His theories have been _____ by recent research.

- A. Pronounced
- B. Rearmed
- C. Dammed
- D. Debunked ✓ **Correct answer**

A. "Pronounced" does not fit: theories are not "pronounced" by research.

B. "Rearmed" does not fit: theories are not "rearmed" by research.

C. "Dammed" does not fit: theories are not "dammed" by research.

D. "His theories have been debunked by recent research" — debunked means shown to be false, which is the only fitting word. PICK-ONE: the official key marks this question X (cancelled), but the question as printed has a unique correct answer, confirmed by the Learnospot quiz.

Question 104 English

International rules _____ the number of foreign entrants.

- A. Hoodwink
- B. Stipulate ✓ **Correct answer**
- C. Fabricate
- D. Traverse

A. "Hoodwink" means to deceive; it does not fit.

B. "International rules stipulate the number of foreign entrants" — stipulate means to specify as a condition, which fits.

C. "Fabricate" means to invent falsely; it does not fit.

D. "Traverse" means to travel across; it does not fit.

105 English

The assassination of the president _____ the country into war.

- A. Articulated
- B. Boomed
- C. Hobbled
- D. Precipitated ✓ **Correct answer**

A. "Articulated" means expressed clearly; it does not fit.

B. "Boomed" means grew rapidly; it does not fit.

C. "Hobbled" means hampered; it does not fit.

D. "Precipitated the country into war" — precipitated means caused suddenly, which fits.

Question 106 English

She might be forgiven for _____ beneath the pressure.

- A. Undertaking
- B. Extricating
- C. Buckling ✓ **Correct answer**
- D. Resounding

A. "Undertaking beneath the pressure" does not fit.

B. "Extricating beneath the pressure" does not fit.

C. "Buckling beneath the pressure" — buckling means giving way under pressure, which fits.

D. "Resounding beneath the pressure" does not fit.

107 English

SPOT THE ERROR: It showed that he was a man capable of looking beneath the surface of things, a man not dependent in paper manifestations. [The underlined segments are: A "showed", B "capable of", C "looking beneath", D "dependent in".]

- A. showed
- B. capable of
- C. looking beneath
- D. dependent in ✓ **Correct answer**

A. "It showed that he was a man..." is correct English.

B. "capable of looking" is correct English.

C. "looking beneath the surface of things" is correct English.

D. "dependent in" is wrong; the correct idiom is "dependent on" — a man not dependent on paper manifestations.

Question 108 English

SPOT THE ERROR: When he was a child, every time he were naughty, his foster-mother used to threaten to send him to Timbuktu. [The underlined segments are: A "he was", B "he were", C "used to", D "to send him".]

- A. he was
- B. he were ✓ **Correct answer**
- C. used to
- D. to send him

A. "When he was a child" is correct English.

B. "every time he were naughty" is wrong: the subject "he" takes "was", not "were".

C. "used to threaten" is correct English.

them to send him" is correct English.

Question 109 English

SPOT THE ERROR: I was faced with alternatively of either evicting the books or else leaving them in sole, undisturbed tenancy and taking rooms elsewhere for myself. [The underlined segments are: A "with alternatively", B "of either", C "or else", D "taking rooms".]

- A. with alternatively ✓ **Correct answer**
- B. of either
- C. or else
- D. taking rooms

A. "alternatively" is an adverb; the sentence needs the noun "the alternative" ("faced with the alternative of either…").

B. "the alternative of either evicting… or else leaving…" is correct English.

C. "or else leaving them…" is correct English.

D. "taking rooms elsewhere for myself" is correct English.

Question 110 English

SPOT THE ERROR: I remember going to the British museum one day to read for the treatment for some slight ailment of which I had a touch — hay fever, I fancy it was. [The underlined segments are: A "going to", B "read for", C "of which", D "I had".]

- A. going to
- B. read for ✓ **Correct answer**
- C. of which
- D. I had

A. "I remember going to the British museum" is correct English.

or the treatment" is wrong: one reads about (or on) a treatment, not "for" it.

C. "some slight ailment of which I had a touch" is correct English.

D. "of which I had a touch" is correct English.

Question 111 English

SPOT THE ERROR: The number of people in the world are rapidly increasing rather like a gigantic snowball which not only gets bigger as it rolls but goes faster as well. [The underlined segments are: A "are rapidly", B "rather like a", C "gets bigger", D "but goes faster".]

- A. are rapidly ✓ **Correct answer**
- B. rather like a
- C. gets bigger
- D. but goes faster

A. "The number of people... are" is wrong: "the number" is singular, so the verb must be "is" ("The number... is rapidly increasing").

B. "rather like a gigantic snowball" is correct English.

C. "gets bigger as it rolls" is correct English.

D. "but goes faster as well" is correct English.

Question 112 English

SPOT THE ERROR: It has been calculated that unless the growth is checked, there will only be enough room on the earth for people to stand by. [The underlined segments are: A "has been calculated", B "is checked", C "will only be", D "stand by".]

- A. has been calculated
- B. is checked
- C. will only be

nd by ✓ Correct answer

A. "It has been calculated that..." is correct English.

B. "unless the growth is checked" is correct English.

C. "there will only be enough room" is correct English.

D. "room for people to stand by" is wrong: "stand by" means to wait or observe; the sentence needs "stand" (room for people to stand).

Question 113 English

Choose the CORRECT sentence:

- A. Inside a carton was a push-button unit fastened with a small wooden box.
- B. Inside a carton was a push-button unit fastened by a small wooden box.
- C. Inside a carton was a push-button unit fastened to a small wooden box. ✓ **Correct answer**
- D. Inside a carton was a push-button unit fastened along a small wooden box.

A. Wrong: a unit is fastened "to" a box, not "with" it.

B. Wrong: "fastened by" would mean the box did the fastening.

C. Correct: "fastened to" is the right preposition.

D. Wrong: "fastened along" is not idiomatic here.

Question 114 English

Choose the CORRECT sentence:

- A. They both looked to one another, startled by all they had just finished saying.
- B. They both looked to each another, startled by all they had just finish saying.
- C. They both looked to each another, startle by all they had just finish saying.
- D. They both looked to each another, startled by all they had just finished saying. ✓

A. Wrong: for two people the reciprocal pronoun is "each other", not "one another".

B. Wrong: "had just finish saying" should be "had just finished saying".

C. Wrong: "startle" should be "startled" and "finish" should be "finished".

D. The keyed answer; the paper prints "each another" (for "each other") in this sentence.

Question 115 English

Choose the CORRECT sentence:

- A. The lovely sentiments we go through repeating!
- B. The lovely sentiments we go about repeating! ✓ **Correct answer**
- C. The lovely sentiments we go in repeating!
- D. The lovely sentiments we go for repeating!

A. Wrong: "go through repeating" is not idiomatic.

B. Correct: "go about repeating" is the idiomatic phrase.

C. Wrong: "go in repeating" is not idiomatic.

D. Wrong: "go for repeating" is not idiomatic.

Question 116 English

Choose the CORRECT sentence:

- A. With the bright light, still in her eyes, she moved quick out of the door.
- B. With the bright light, still in her eyes, she moved quick out to the door.
- C. With the bright light, still in her eyes, she moved quickly out to the door.
- D. With the bright light, still in her eyes, she moved quickly out of the door. ✓ **Correct answer**

uick" should be the adverb "quickly".

B. Wrong: "quick" should be "quickly", and "out to the door" is less idiomatic than "out of the door".

C. Wrong: "out to the door" is not the idiomatic phrase; "out of the door" is.

D. Correct: "quickly" and "out of the door".

Question 117 English

Choose the CORRECT sentence:

- A. In a short while quiet a large crowd had been collected.
- B. In a short while quite a large crowd had collected. ✓ **Correct answer**
- C. In a short while quite large crowd had collected.
- D. In a short while quite the large crowd had been collecting.

A. Wrong: "quiet" (silent) should be "quite" (very), and "had been collected" is the wrong voice.

B. Correct: "quite a large crowd" and the intransitive "had collected".

C. Wrong: "quite large crowd" needs the article "a".

D. Wrong: "quite the large crowd" is not idiomatic, and "had been collecting" is the wrong tense/voice.

Question 118 English

Choose the CORRECT sentence:

- A. She watched all the important matches in the Brookfield ground.
- B. She watched all the important matches on the Brookfield ground. ✓ **Correct answer**
- C. She watched all the important matches from the Brookfield ground.

watched all the important matches within the Brookfield ground.

A. Wrong: matches are watched "on" a ground, not "in" it.

B. Correct: "on the ground" is the idiomatic preposition.

C. Wrong: "from" would mean she watched from the ground as a viewpoint.

D. Wrong: "within" is not idiomatic here.

Question 119 English

Choose the CORRECT sentence:

- A. Something had happened, something whose ultimate significance had yet to be reckon.
- B. Something had happened, something whose ultimate significance had yet was reckon.
- C. Something had happened, something whose ultimate significance had yet to be reckoned. ✓ **Correct answer**
- D. Something had happened, something whose ultimate significance had yet reckoned.

A. Wrong: "to be reckon" should be "to be reckoned".

B. Wrong: "had yet was reckon" is ungrammatical.

C. Correct: "had yet to be reckoned" is grammatical.

D. Wrong: "had yet reckoned" is ungrammatical.

Question 120 English

Choose the CORRECT sentence:

- A. His faculties were all unimpairment, and he had no personal worries of any kind.
- B. His faculties were all unimpairing, and he had no personal worries of any kind.

faculties were all unimpaired, and he had no personal worry of any kind.

- D. His faculties were all unimpaired, and he had no personal worries of any kind. ✓

  Correct answer

A. Wrong: "unimpairment" is a noun; the adjective "unimpaired" is needed.

B. Wrong: "unimparing" is not the correct form; "unimpaired" is.

C. Wrong: "no personal worry" should be "no personal worries".

D. Correct.

Question 121 English

Choose the CORRECT sentence:

- A. It was hard to him to speak out loud, but he managed to murmur something.
- B. It was hard on him to speak out loud, but he managed to murmur something.
- C. It was hard for him to speak out loud, but he managed to murmur something. ✓

  Correct answer
- D. It was hard upon him to speak out loud, but he managed to murmur something.

A. Wrong: "hard to him" is not idiomatic; "hard for him" is.

B. Wrong: "hard on him" means harsh on him, not difficult for him.

C. Correct: "hard for him" is the idiomatic phrase.

D. Wrong: "hard upon him" is not idiomatic here.

Question 122 English

Choose the CORRECT sentence:

- A. There was a little money saved up beside.
- B. There was little money saved in besides.
- C. There was little money saved up beside.

re was a little money saved up besides. ✓ **Correct answer**

A. Wrong: "beside" means next to; the sentence needs "besides" (in addition).

B. Wrong: "saved in besides" is ungrammatical, and "little money" changes the meaning.

C. Wrong: "beside" means next to, and "little money" changes the meaning.

D. Correct: "a little money" (some money) "saved up besides" (in addition to what was spent).

Question 123 English

Select the NEAREST CORRECT MEANING of the given word: STALWART

- A. Loyal ✓ **Correct answer**
- B. Lazy
- C. Lacking strength
- D. High

A. A stalwart is a loyal, reliable supporter.

B. "Lazy" is the opposite of the sense of stalwart.

C. "Lacking strength" is the opposite of stalwart (sturdy, strong).

D. "High" is not the meaning of stalwart.

Question 124 English

Select the NEAREST CORRECT MEANING of the given word: CHIVALRY

- A. Coward
- B. Non-cooperative
- C. Imitating
- D. Gallant ✓ **Correct answer**

is the opposite of chivalry.

B. "Non-cooperative" is not the meaning of chivalry.

C. "Imitating" is not the meaning of chivalry.

D. Chivalry is gallant, courteous behaviour (especially towards women).

Question 125 English

Select the NEAREST CORRECT MEANING of the given word: RAKISH

- A. Curved
- B. Traditional
- C. Formal
- D. Dashing ✓ **Correct answer**

A. "Curved" is not the meaning of rakish.

B. "Traditional" is not the meaning of rakish.

C. "Formal" is not the meaning of rakish.

D. Rakish means dashing, jaunty, stylishly disreputable.

Question 126 English

Select the NEAREST CORRECT MEANING of the given word: PRODIGIOUS

- A. Huge ✓ **Correct answer**
- B. Trivial
- C. Little
- D. Square

A. Prodigious means huge, enormous.

B. "Trivial" is the opposite of prodigious.

he opposite of prodigious.

D. "Square" is not the meaning of prodigious.

Question 127 English

Select the NEAREST CORRECT MEANING of the given word: IMPROVISE

- A. Colophon
- B. Concoct ✓ **Correct answer**
- C. Divert
- D. Respite

A. A colophon is a publisher's emblem; it is not the meaning of improvise.

B. To improvise is to make up on the spot; "concoct" (to invent, make up) is the nearest meaning.

C. "Divert" means to turn aside; it is not the meaning of improvise.

D. "Respite" means a rest; it is not the meaning of improvise.

Question 128 English

Select the NEAREST CORRECT MEANING of the given word: PARADOX

- A. Anomaly ✓ **Correct answer**
- B. Prototype
- C. Steward
- D. Fashion

A. A paradox is a seemingly contradictory statement; "anomaly" (something that deviates from the norm) is the nearest meaning.

B. "Prototype" means an original model; it is not the meaning of paradox.

C. "Steward" means a manager or attendant; it is not the meaning of paradox.

is not the meaning of paradox.

Question 129 English

Select the NEAREST CORRECT MEANING of the given word: MANIFESTATION

- A. Mode
- B. Token ✓ **Correct answer**
- C. Quirk
- D. Bulwark

A. "Mode" means a manner or fashion; it is not the meaning of manifestation.

B. A manifestation is a visible sign or token of something.

C. "Quirk" means a peculiarity; it is not the meaning of manifestation.

D. "Bulwark" means a defensive wall; it is not the meaning of manifestation.

Question 130 English

Select the NEAREST CORRECT MEANING of the given word: RECONNOITRE

- A. Patrol ✓ **Correct answer**
- B. Arcane
- C. Exhort
- D. Falter

A. To reconnoitre is to survey or patrol an area (especially for military purposes).

B. "Arcane" means mysterious; it is not the meaning of reconnoitre.

C. "Exhort" means to urge; it is not the meaning of reconnoitre.

D. "Falter" means to hesitate; it is not the meaning of reconnoitre.

131 English

Select the NEAREST CORRECT MEANING of the given word: SOJOURN

- A. Visit ✓ **Correct answer**
- B. Belch
- C. Furry
- D. Inking

A. A sojourn is a temporary stay or visit.

B. "Belch" means to burp; it is not the meaning of sojourn.

C. "Furry" means covered in fur; it is not the meaning of sojourn.

D. "Inking" is not the meaning of sojourn.

Question 132 English

Select the NEAREST CORRECT MEANING of the given word: MUSE

- A. Immaculate
- B. Chew over ✓ **Correct answer**
- C. Sigh over
- D. Vagary

A. "Immaculate" means spotless; it is not the meaning of muse.

B. To muse is to think deeply, to "chew over" something in one's mind.

C. "Sigh over" is not the meaning of muse.

D. "Vagary" means a whim; it is not the meaning of muse.

Question 133 Biology

Random, uncontrolled activity of some cells in the brain leading to chaotic activity in

y and motor nerves causes patients of to see and hear different strange things.

- A. Epilepsy ✓ **Correct answer**
- B. Parkinson's Disease
- C. Alzheimer's Disease
- D. Huntington's Disease

A. Random uncontrolled electrical activity of brain cells (seizures) with sensory and motor disturbances is epilepsy.

B. Parkinson's disease is a progressive movement disorder (tremor, rigidity), not random uncontrolled brain-cell activity with strange sights and sounds.

C. Alzheimer's disease is progressive memory loss and dementia, not seizure-like chaotic brain activity.

D. Huntington's disease is a hereditary disorder with chorea and dementia, not seizure-like chaotic brain activity.

Question 134 Biology

Part of hind brain responsible for the balance and equilibrium of body is called:

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

A. The medulla controls involuntary actions (heartbeat, breathing), not balance.

B. The cerebellum (part of the hind brain) coordinates movement and maintains balance and equilibrium.

C. The pons relays signals between the cerebrum and cerebellum; it is not the balance centre.

mus is a relay station in the forebrain, not the balance centre.

Question 135 Biology

Events of menustral cycle are regulated by the:

- A. Ethylene
- B. Gonadotrophins ✓ **Correct answer**
- C. Auxins
- D. Gibberellins

A. Ethylene is a plant hormone; it does not regulate the menstrual cycle.

B. The menstrual cycle is regulated by the gonadotrophins FSH and LH (from the pituitary) together with oestrogen and progesterone.

C. Auxins are plant hormones; they do not regulate the menstrual cycle.

D. Gibberellins are plant hormones; they do not regulate the menstrual cycle.

Question 136 Biology

Decrease of FSH and increase of estrogen cause pituitary gland to secrete:

- A. Somatotropin
- B. Luteinizing Hormone ✓ **Correct answer**
- C. Testosterone
- D. Spermatogonium

A. Somatotropin (growth hormone) is not secreted in response to rising oestrogen in the menstrual cycle.

B. Rising oestrogen (with falling FSH) triggers the LH surge from the pituitary, causing ovulation.

C. Testosterone is a male sex hormone, not secreted by the pituitary in this context.

togonium is a germ cell, not a hormone.

Question 137 Biology

Transmission of Neisseria gonorrhea is best described by which one of the following?

- A. Oro-fecal Route
- B. Unsafe Sex ✓ **Correct answer**
- C. Vector Borne
- D. Droplet Infection

A. This is the official key's answer, but gonorrhea is not transmitted by the oro-fecal route.

B. Neisseria gonorrhoeae is a sexually transmitted bacterium; unsafe sex is how it spreads. CORRECTED: the official key (A) is wrong; the Learnospot quiz and the microbiology both give unsafe sex.

C. Gonorrhea is not transmitted by a vector (insect).

D. Gonorrhea is not transmitted by droplets.

Question 138 Biology

Syphilis is caused by:

- A. Spirochete ✓ **Correct answer**
- B. Nostoc
- C. Water blooms
- D. Cyanobacteria

A. Syphilis is caused by the spirochete Treponema pallidum.

B. Nostoc is a nitrogen-fixing cyanobacterium; it does not cause syphilis.

C. Water blooms are algal overgrowths; they do not cause syphilis.

D. Cyanobacteria do not cause syphilis.

139 Biology

AIDS is caused by:

- A. Bacteria
- B. Virus ✓ **Correct answer**
- C. Fungi
- D. Alga

A. AIDS is not caused by bacteria.

B. AIDS is caused by HIV (human immunodeficiency virus).

C. AIDS is not caused by fungi.

D. AIDS is not caused by algae.

Question 140 Biology

Brain is protected and enclosed in:

- A. Lumbar vertebrae
- B. Coccyx
- C. Vertebral column
- D. Cranium ✓ **Correct answer**

A. The lumbar vertebrae protect the lower spinal cord, not the brain.

B. The coccyx (tailbone) is at the end of the vertebral column; it does not enclose the brain.

C. The vertebral column encloses the spinal cord, not the brain.

D. The brain is protected and enclosed in the cranium (skull).

Question 141 Biology

Longest bone in the human skeleton is:

- B. Fibula
- C. Tibia
- D. Femur ✓ **Correct answer**

A. The ulna (forearm) is much shorter than the femur.

B. The fibula (lower leg) is much shorter than the femur.

C. The tibia (shin bone) is the second-longest bone, shorter than the femur.

D. The femur (thigh bone) is the longest bone in the human skeleton.

Question 142 Biology

Hips and shoulder joints are examples of:

- A. Hinge Joints
- B. Ball and Socket Joints ✓ **Correct answer**
- C. Synovial Joints
- D. Cartilaginous Joints

A. Hinge joints (e.g. elbow, knee) allow movement in one plane only; hips and shoulders move in many directions.

B. The hip and shoulder are ball-and-socket joints, allowing movement in many directions.

C. Ball-and-socket joints are a type of synovial joint, but the specific answer asked for is ball-and-socket.

D. Cartilaginous joints (e.g. between vertebrae) allow little movement; hips and shoulders are not cartilaginous joints.

Question 143 Biology

In pelvic region of human bosy, sacrum is formed by the fusion of:

- B. 5 Vertebrae ✓ **Correct answer**
- C. 6 Vertebrae
- D. 3 Vertebrae

A. The sacrum is formed by the fusion of 5 sacral vertebrae, not 4.

B. The sacrum is formed by the fusion of five sacral vertebrae.

C. The sacrum is formed by the fusion of 5 sacral vertebrae, not 6.

D. The sacrum is formed by the fusion of 5 sacral vertebrae, not 3.

Question 144 Biology

Each muscle fibre is surrounded by a modified cell membrance called:

- A. Sarcolemma ✓ **Correct answer**
- B. Sarcomere
- C. Myosin Filament
- D. Myofilament

A. The cell membrane surrounding each muscle fibre is the sarcolemma.

B. A sarcomere is the contractile unit of a muscle fibre, not its membrane.

C. A myosin filament is a thick filament inside the fibre, not its membrane.

D. A myofilament is a filament (actin or myosin) inside the fibre, not its membrane.

Question 145 Biology

_____ hormone is antagonistic to insulin and causes increase in blood glucose level.

- A. Glucagon ✓ **Correct answer**
- B. Nor-epinephrine
- C. Calcitonin

A. Glucagon (from the alpha cells of the islets of Langerhans) opposes insulin and raises blood glucose.

B. Nor-epinephrine also raises blood glucose, but the classic insulin antagonist named in the textbook is glucagon.

C. Calcitonin lowers blood calcium; it does not oppose insulin.

D. Thyroxine regulates metabolism; it is not the insulin antagonist named here.

Question 146 Biology

Beta cells of islets of Langerhans produce _____ hormone.

- A. Glucagon
- B. Insulin ✓ **Correct answer**
- C. Pancreatic Juice
- D. Parathormone

A. Glucagon is produced by the alpha cells, not the beta cells.

B. The beta cells of the islets of Langerhans produce insulin.

C. Pancreatic juice is produced by the exocrine pancreas, not by the beta cells.

D. Parathormone is produced by the parathyroid glands, not by the beta cells.

Question 147 Biology

The central portion of adrenal gland (Adrenal Medulla) produces _____ hormone.

- A. Aldosterone
- B. Epinephrine ✓ **Correct answer**
- C. Androgen
- D. Corticosterone

ne is produced by the adrenal cortex, not the medulla.

B. The adrenal medulla produces epinephrine (adrenaline) and nor-epinephrine.

C. Androgens are produced by the adrenal cortex (and the gonads), not the medulla.

D. Corticosterone is a corticosteroid from the adrenal cortex, not the medulla.

Question 148 Biology

_____ hormones are called fight and flight hormones as they prepare an organism to face stressful situation.

- A. Adrenaline, Aldosterone
- B. Epinephrine, Nor-epinephrine ✓ **Correct answer**
- C. Cortisone, Oxytocin
- D. Thyroxine, Nor-epinephrine

A. Aldosterone is a mineralocorticoid, not a fight-and-flight hormone; adrenaline is epinephrine, but the pair named in the textbook is epinephrine and nor-epinephrine.

B. Epinephrine and nor-epinephrine (from the adrenal medulla) are the fight-and-flight hormones.

C. Cortisone and oxytocin are not the fight-and-flight hormones.

D. Thyroxine is not a fight-and-flight hormone.

Question 149 Biology

B-cells release antibodies in blood plasma, tissue fluid and lymph. This kind of immune response is called:

- A. Cell Mediated Response
- B. Humoral Response ✓ **Correct answer**
- C. Active Response

A. Cell-mediated immunity is carried out by T-cells, not by antibodies from B-cells.

B. Antibodies released by B-cells into the blood and lymph are the humoral immune response.

C. "Active response" is not the name for antibody-mediated immunity.

D. "Compound response" is not a type of immune response.

Question 150 Biology

The type of immunity in which antibodies are passed from one individual to another is called:

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

A. Immunity from antibodies received ready-made from another individual (e.g. mother's milk, antiserum) is passive immunity.

B. Artificial active immunity is produced by vaccination, not by receiving antibodies.

C. Natural active immunity follows an infection, not the transfer of antibodies.

D. Humoral immunity is antibody-mediated immunity in general, not specifically the transfer of antibodies between individuals.

Question 151 Biology

To combat the active infections of tetanus, rabies and snakes the _____ method of immunization is used:

- A. Active

- C. Active Artificial
- D. Passive ✓ **Correct answer**

A. Active immunization (vaccination) is too slow for an active infection; ready-made antibodies are needed.

B. "Humoral" is a type of immune response, not a method of immunization.

C. Active artificial immunization (vaccination) takes time to produce antibodies, so it cannot combat an infection already in progress.

D. For tetanus, rabies and snake bites, ready-made antibodies (antiserum) are given — passive immunization, which acts at once.

Question 152 Biology

In antibody molecule, two heavy and two light chains are bonded by:

- A. Disulphide Bond ✓ **Correct answer**
- B. Monosulphide Bond
- C. Hydrogen Bond
- D. Ionic Bond

A. The heavy and light chains of an antibody are held together by disulphide bonds.

B. There is no "monosulphide bond" holding antibody chains together.

C. Hydrogen bonds do not hold the heavy and light chains together.

D. Ionic bonds do not hold the heavy and light chains together.

Question 153 Biology

Variable amino acid sequences in antibody molecule are found in _____.

- A. Both light chains only

- C. One heavy and one light chain
- D. Both heavy and light chains ✓ **Correct answer**

A. Variable regions are in both the heavy and the light chains, not only the light chains.

B. Variable regions are in both the heavy and the light chains, not only the heavy chains.

C. Each antibody has variable regions in both its heavy chains and both its light chains.

D. The variable amino acid sequences (the antigen-binding regions) are found in both the heavy and the light chains.

Question 154 Biology

Each _____ consists of a light gathering antenna complex and reaction center.

- A. Chlorophyll
- B. Photosystem ✓ **Correct answer**
- C. Photon
- D. Electron

A. Chlorophyll is a pigment, not the complex of antenna + reaction centre.

B. Each photosystem consists of a light-gathering antenna complex and a reaction centre.

C. A photon is a packet of light energy, not the antenna + reaction-centre complex.

D. An electron is a particle, not the antenna + reaction-centre complex.

Question 155 Biology

Photosystem I has chlorophyll a molecules which absorb maximum light of:

- A. 680 nm
- B. 780 nm
- C. 700 nm ✓ **Correct answer**

A. 680 nm is the absorption maximum of Photosystem II (P680), not Photosystem I.

B. Photosystem I absorbs maximally at 700 nm, not 780 nm.

C. Photosystem I (P700) has chlorophyll a molecules absorbing maximally at 700 nm.

D. Photosystem I absorbs maximally at 700 nm, not 580 nm.

Question 156 Biology

Cyclic flow or C4 photosynthesis produces:

- A. ATP and CO2
- B. ATP ✓ **Correct answer**
- C. Only CO2
- D. Only Oxygen

A. Cyclic photophosphorylation produces ATP only; it does not produce CO2.

B. Cyclic electron flow produces ATP only (no NADPH, no oxygen).

C. Cyclic flow does not produce CO2.

D. Cyclic flow does not produce oxygen (no water is split).

Question 157 Biology

Immediate product formed after CO2 fixation in Calvin Cycle is:

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

A. CO2 combines with RuBP (5 carbons) to form an unstable 6-carbon compound, which at

into two 3-carbon molecules (PGA).

B. RuBP itself is the 5-carbon compound; the product after CO2 fixation is the 6-carbon compound.

C. The product after CO2 fixation is the 6-carbon compound, not a 4-carbon one.

D. The 3-carbon compound (PGA) is formed after the 6-carbon compound splits, not immediately after fixation.

Note: Filed option D read "Unstable 3-carbon compound m" (misprint in the source reproduction); corrected to "Unstable 3-carbon compound" as documented in the reviewed file.

Question 158 Biology

Functional group of chlorophyll a is:

- A. —CH3 ✓ **Correct answer**
- B. —CHO
- C. —COOH
- D. —OH

A. Chlorophyll a has a methyl (–CH3) group where chlorophyll b has an aldehyde group.

B. The aldehyde (–CHO) group is the functional group of chlorophyll b, not chlorophyll a.

C. Chlorophyll a does not have a —COOH group at this position.

D. Chlorophyll a does not have a —OH group at this position.

Question 159 Biology

The modified plasmid or phage DNA is called:

- A. Clone DNA
- B. Recombinant DNA ✓ **Correct answer**

- D. rDNA

A. "Clone DNA" is not the term for a modified plasmid or phage DNA.

B. A plasmid or phage DNA into which foreign DNA has been inserted is recombinant DNA.

C. cDNA is DNA made from mRNA by reverse transcription, not a modified plasmid.

D. "rDNA" is the abbreviation of recombinant DNA — the same substance as B, in abbreviated form; the official key gives the full term (B).

Question 160 Biology

The rapid exchange of materials through carrier proteins across the plasma membrane is called:

- A. Passive Diffusion
- B. Active Transport
- C. Endocytosis
- D. Facilitated Diffusion ✓ **Correct answer**

A. Passive diffusion is movement down a gradient without a carrier protein.

B. Active transport uses energy to move substances against a gradient; the rapid carrier-mediated exchange described here is facilitated diffusion.

C. Endocytosis is the engulfing of material by the membrane, not carrier-mediated exchange.

D. Movement of substances across the membrane through carrier proteins, down the concentration gradient, is facilitated diffusion.

161 Biology

The inner membrane of mitochondria form extensive infoldings called:

- A. Cristae ✓ **Correct answer**
- B. Cisternae
- C. Lamella
- D. Bifidae

A. The inner mitochondrial membrane folds into cristae.

B. Cisternae are the flattened sacs of the endoplasmic reticulum and Golgi apparatus, not mitochondrial folds.

C. Lamellae are the thylakoid stacks' membranes in chloroplasts, not mitochondrial folds.

D. "Bifidae" is not a mitochondrial structure.

Question 162 Biology

Which one of the following organelle is found in both prokaryotic and eukaryotic cells?

- A. Centriole
- B. Endoplasmic Reticulum
- C. Nucleus
- D. Ribosome ✓ **Correct answer**

A. Centrioles are found in animal (eukaryotic) cells, not in prokaryotes.

B. The endoplasmic reticulum is found only in eukaryotes.

C. A true nucleus is found only in eukaryotes.

D. Ribosomes are found in both prokaryotic and eukaryotic cells.

163 Biology

The compounds which on hydrolysis yield polyhydroxy aldehyde or ketone subunits are:

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

A. Lipids hydrolyse to fatty acids and glycerol, not to polyhydroxy aldehydes or ketones.

B. Proteins hydrolyse to amino acids, not to polyhydroxy aldehydes or ketones.

C. Polynucleotides hydrolyse to nucleotides, not to polyhydroxy aldehydes or ketones.

D. Carbohydrates hydrolyse to monosaccharides (polyhydroxy aldehydes or ketones).

Question 164 Biology

Which one of the following is the formula structure of D (α) glucose? [Four Haworth structures: A) six-membered ring, CH2OH up, C1 OH down, C2 OH down, C3 OH up, C4 OH down; B) six-membered ring with C1 OH up; C) six-membered ring with CH2OH on the anomeric carbon; D) five-membered (furanose) ring]

- A. Six-membered ring: CH2OH up, C1 OH down, C2 OH down, C3 OH up, C4 OH down (α-D-glucose) ✓ **Correct answer**
- B. Six-membered ring with C1 OH up (β-D-glucose)
- C. Six-membered ring with CH2OH on the anomeric carbon
- D. Five-membered (furanose) ring

A. In α-D-glucose the anomeric (C1) OH is down, C2 OH down, C3 OH up, C4 OH down and CH2OH up — exactly this structure.

B. With the C1 OH up, this is β-D-glucose, not α-D-glucose.

C. The CH2OH group is on C5 in glucose, not on the anomeric carbon.

se is drawn as a six-membered (pyranose) ring, not a five-membered furanose ring.

Question 165 Biology

Secondary structure of protein is found in:

- A. Trypsin
- B. Keratin ✓ **Correct answer**
- C. Insulin
- D. Glucagon

A. Trypsin is an enzyme with a globular (tertiary) structure; it is not the textbook example of secondary structure.

B. Keratin is the textbook example of a protein with secondary structure (the α-helix).

C. Insulin is a small globular protein; it is not the textbook example of secondary structure.

D. Glucagon is a small peptide hormone; it is not the textbook example of secondary structure.

Question 166 Biology

Waxes are formed by combination of fatty acids with:

- A. Alcohol ✓ **Correct answer**
- B. Glycerol
- C. Serine
- D. Cysteine

A. Waxes are esters of long-chain fatty acids with long-chain (monohydric) alcohols.

B. Fatty acids with glycerol form fats and oils (triglycerides), not waxes.

C. Serine is an amino acid; it does not combine with fatty acids to form waxes.

s an amino acid, it does not combine with fatty acids to form waxes.

Question 167 Biology

Phosphodiester bond is:

- A. P—O—C—P—O—C
- B. C—O—P
- C. C—O—P—O—C ✓ **Correct answer**
- D. C—C—O—P

A. A phosphodiester bond links two carbons through one phosphate (C—O—P—O—C), not two phosphates.

B. C—O—P is a phosphate ester, not a phosphodiester bond.

C. A phosphodiester bond is C—O—P—O—C (the phosphate group joined to two carbons through oxygen atoms).

D. C—C—O—P is not a phosphodiester bond.

Question 168 Biology

An enzyme required Mg++ to catalyze the substrate. The Mg++ is best identified as:

- A. Prosthetic group
- B. Activator ✓ **Correct answer**
- C. Co-enzyme
- D. Inhibitor

A. A prosthetic group is a non-protein part permanently bound to the enzyme; Mg^{2+} is a loosely bound metal ion.

B. A metal ion (Mg^{2+}) that an enzyme needs to work is an activator (cofactor).

C. A co-enzyme is an organic (non-protein) molecule, not a metal ion.

s the enzyme work, it does not inhibit it.

Question 169 Biology

[Figure: an enzyme with a substrate fitting its active site, and an inhibitor (a separate wedge-shaped molecule) approaching a different site on the enzyme] This figure represents _____ inhibitor.

- A. Non-competitive ✓ **Correct answer**
- B. Competitive
- C. Irreversible
- D. Isosteric

A. The figure shows the inhibitor binding at a site other than the active site (away from the substrate), which is non-competitive inhibition.

B. A competitive inhibitor binds at the active site itself, competing with the substrate; the figure shows the inhibitor at a separate site.

C. Irreversible inhibition is permanent inactivation; the figure does not show that.

D. "Isosteric" is not the term for this kind of inhibition.

Question 170 Biology

According to _____ model the active site of enzyme is modified as the substrate interacts with enzyme.

- A. Induced fit ✓ **Correct answer**
- B. Lock and Key
- C. Emil Fischer
- D. Fluid Mosaic

A. In the induced-fit model the active site changes shape (is modified) as the substrate binds.

k-and-key model the active site is rigid and does not change shape.

C. Emil Fischer proposed the lock-and-key model, not the induced-fit model.

D. The fluid mosaic model describes the cell membrane, not enzyme action.

Question 171 Biology

Which one of the following graphs shows how the rate of reaction of pepsin is affected by pH? [Four rate-vs-pH graphs: A) broad bell curve peaking at pH 5–6; B) low plateau from pH 4, slightly declining; C) rising to a plateau at pH 6–7; D) sharp narrow peak at pH ~2, falling to zero by pH 5]

- A. Broad bell curve peaking at pH 5–6
- B. Low plateau from pH 4, slightly declining
- C. Rising to a plateau at pH 6–7
- D. Sharp narrow peak at pH ~2, falling to zero by pH 5 ✓ **Correct answer**

A. Pepsin works in the stomach at about pH 2, not pH 5–6.

B. Pepsin has a sharp optimum at about pH 2, not a plateau from pH 4.

C. Pepsin is inactive at pH 6–7; its optimum is about pH 2.

D. Pepsin (a stomach enzyme) has its optimum at about pH 2, with activity falling sharply as the pH rises.

Question 172 Biology

All viruses can reproduce within living organisms only, so they are known as:

- A. Ectoparasites
- B. Endoparasites
- C. Obligative Intracellular Parasites ✓ **Correct answer**
- D. Facultative Intracellular Parasites

ites live on the outside of a host; viruses live inside cells.

B. Viruses are more specifically obligate intracellular parasites (they must reproduce inside a living cell).

C. Viruses can reproduce only inside a living host cell, so they are obligate intracellular parasites.

D. "Facultative" would mean they can also reproduce outside cells, which viruses cannot.

Question 173 Biology

Many bacteria are motile due to presence of:

- A. Flagella ✓ **Correct answer**
- B. Pilli
- C. Cilia
- D. Microtubules

A. Many bacteria move by means of flagella.

B. Pili are for attachment and conjugation, not for swimming.

C. Cilia are found in eukaryotes (e.g. Paramecium), not in bacteria.

D. Microtubules are eukaryotic structures; bacteria do not have them.

Question 174 Biology

_____ is an invagination of cell membrane which helps in cell division.

- A. Fimbriae
- B. Nucleoid
- C. Mesosome ✓ **Correct answer**
- D. Endospore

A. Fimbriae are hair-like structures for attachment, not membrane invaginations.

noid is the bacterial DNA region, not a membrane invagination.

C. The mesosome is an invagination of the bacterial cell membrane that helps in cell division (and respiration).

D. An endospore is a resistant resting structure, not a membrane invagination.

Question 175 Biology

_____ is the yeast that grows in the mucous membrane of mouth or vagina.

- A. Candida albicans ✓ **Correct answer**
- B. Saccharomyces cerevisiae
- C. Aspergillus fumigatus
- D. Aspergillus flavus

A. Candida albicans is the yeast that causes thrush of the mouth and vagina.

B. Saccharomyces cerevisiae is baker's/brewer's yeast; it does not grow in the mucous membranes.

C. Aspergillus fumigatus is a mould that causes lung infections, not a yeast of the mouth or vagina.

D. Aspergillus flavus is a mould, not a yeast of the mouth or vagina.

Question 176 Biology

Taenia is an endoparasite of human, pig and cattle which belongs to phylum.

- A. Cnidaria
- B. Aschelminthes
- C. Annelida
- D. Platyhelminthes ✓ **Correct answer**

A. Cnidaria (jellyfish, corals) are free-living aquatic animals, not the phylum of Taenia.

thes (roundworms) is the phylum of Ascaris, not of Taenia.

C. Annelida (segmented worms) is the phylum of the earthworm, not of Taenia.

D. Taenia (tapeworm) is a flatworm, belonging to phylum Platyhelminthes.

Question 177 Biology

Body of _____ consists of segments called proglottis which contains mainly sex organs.

- A. Planaria
- B. Ascaris
- C. Fasciola
- D. Tapeworm ✓ **Correct answer**

A. Planaria is a free-living flatworm; its body is not divided into proglottides.

B. Ascaris (roundworm) has an unsegmented cylindrical body, not proglottides.

C. Fasciola (liver fluke) is a leaf-shaped flatworm without proglottides.

D. The tapeworm's body consists of segments called proglottides, each containing mainly reproductive (sex) organs.

Question 178 Biology

_____ is a common parasite of the intestine of human and pig which belongs to phylum nematode.

- A. Taenia solium
- B. Schistosoma
- C. Ascaris lumbricoides ✓ **Correct answer**
- D. Fasciola hepatica

A. Taenia solium is a tapeworm (Platyhelminthes), not a nematode.

B. Schistosoma is a blood fluke (Platyhelminthes), not a nematode.

mbricoides is the common intestinal roundworm of humans and pigs, belonging to phylum Nematoda.

D. Fasciola hepatica is a liver fluke (Platyhelminthes), not a nematode.

Note: Filed option A read "Taenia solanum" (misprint in the source reproduction); corrected to "Taenia solium" as documented in the reviewed file. Filed option C read "Ascaris lumbriocoides" (misprint in the source reproduction); corrected to "Ascaris lumbricoides" as documented in the reviewed file.

Question 179 Biology

In radial symmetry all body parts are arranged around the central axis. Radial symmetry represents _____ mode of life.

- A. Sessile ✓ **Correct answer**
- B. Streamlined
- C. Active
- D. Parasitic

A. Radially symmetric animals (e.g. cnidarians) are sessile (attached) or free-floating; radial symmetry suits a sessile mode of life.

B. A streamlined body suits active swimming, which goes with bilateral symmetry, not radial symmetry.

C. Active, directed movement goes with bilateral symmetry, not radial symmetry.

D. Parasitism is not the mode of life that radial symmetry represents.

Question 180 Biology

Pseudo-coelomates have a body cavity but it is not true coelom. Which one of the following is included in the group.

- A. Planaria

- C. Earthworm
- D. Ascaris ✓ **Correct answer**

A. Planaria is an acoelomate (no body cavity).

B. The tapeworm is an acoelomate flatworm.

C. The earthworm is a true coelomate (Annelida).

D. Ascaris (roundworm) is a pseudocoelomate: it has a body cavity that is not a true coelom.

Question 181 Biology

Digestion of _____ starts in oral cavity due to the action of enzyme present in saliva.

- A. Starch ✓ **Correct answer**
- B. Cellulose
- C. Fatty Acids
- D. Polypeptides

A. Salivary amylase in the mouth begins the digestion of starch.

B. Humans cannot digest cellulose; no salivary enzyme acts on it.

C. Fat digestion does not start in the mouth.

D. Protein digestion does not start in the mouth.

Question 182 Biology

Food enters from stomach into small intestine through:

- A. Pyloric Sphincter ✓ **Correct answer**
- B. Cardiac Sphincter
- C. Semilunar valve

A. Food passes from the stomach into the small intestine through the pyloric sphincter.

B. The cardiac sphincter is between the oesophagus and the stomach.

C. The semilunar valves are in the heart, not the gut.

D. The diaphragm is the breathing muscle, not a gut valve.

Question 183 Biology

_____ are the part of a gastric gland which produce hydrochloric acid.

- A. Parietal Cells ✓ **Correct answer**
- B. Goblet Cells
- C. Chief Cells
- D. Zymogen Cells

A. The parietal (oxyntic) cells of the gastric glands secrete hydrochloric acid.

B. Goblet cells secrete mucus, not hydrochloric acid.

C. Chief cells secrete pepsinogen, not hydrochloric acid.

D. Zymogen cells (chief cells) secrete pepsinogen, not hydrochloric acid.

Question 184 Biology

Protein components of food are digested by the enzymatic secretion of:

- A. Goblet Cells
- B. Parietal Cells
- C. Zymogen Cells ✓ **Correct answer**
- D. Oxyntic Cells

A. Goblet cells secrete mucus, not protein-digesting enzymes.

ells secrete hydrochloric acid, not protein-digesting enzymes.

C. Zymogen (chief) cells secrete pepsinogen, which is activated to pepsin and digests proteins.

D. Oxyntic (parietal) cells secrete hydrochloric acid, not protein-digesting enzymes.

Question 185 Biology

Digestive System consists of different layers, the innermost is known as:

- A. Submucosa
- B. Mucosa ✓ **Correct answer**
- C. Muscularis
- D. Serosa

A. The submucosa is the layer beneath the mucosa, not the innermost layer.

B. The mucosa is the innermost layer of the digestive tract.

C. The muscularis is a middle layer (muscle), not the innermost.

D. The serosa is the outermost layer, not the innermost.

Question 186 Biology

In human the closed sac which surrounds the heart is:

- A. Endocardium
- B. Myocardium
- C. Pericardium ✓ **Correct answer**
- D. Epicardium

A. The endocardium is the inner lining of the heart wall, not the sac around the heart.

B. The myocardium is the heart muscle, not the sac around the heart.

ardium is the closed double-walled sac surrounding the heart.

D. The epicardium is the outer layer of the heart wall (the visceral pericardium), not the sac itself.

Question 187 Biology

Chordae tendinea are fibrous cords attached with:

- A. Cardiac end of stomach valve
- B. Tricuspid valve of heart ✓ **Correct answer**
- C. Pyloric sphincter of stomach
- D. Eyelid

A. The chordae tendineae are in the heart, not the stomach.

B. The chordae tendineae are fibrous cords attaching the atrioventricular (tricuspid and bicuspid) valves to the papillary muscles; the textbook answer is the tricuspid valve.

C. The chordae tendineae are in the heart, not the stomach.

D. The chordae tendineae have nothing to do with the eyelid.

Question 188 Biology

Bicuspid valve controls the flow of blood from:

- A. Right atrium to right ventricle
- B. Right ventricle to pulmonary artery
- C. Left ventricle to aorta
- D. Left atrium to left ventricle ✓ **Correct answer**

A. Blood flows from the right atrium to the right ventricle through the tricuspid valve, not the bicuspid valve.

B. Blood flows from the right ventricle to the pulmonary artery through the pulmonary

valve.

C. Blood flows from the left ventricle to the aorta through the aortic (semilunar) valve. The Learnospot twin keys C, but that is the aortic valve's job.

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

Question 189 Biology

Carboxyhaemoglobin (10-20%) is formed when CO2 combines with:

- A. Amino group of haemoglobin ✓ **Correct answer**
- B. Iron part of haemoglobin
- C. Haem portion of haemoglobin
- D. Plasma proteins

A. CO2 binds to the amino groups of haemoglobin (forming carbaminohaemoglobin, called carboxyhaemoglobin in the textbook) and is carried in this form (10–20% of CO2 transport).

B. The iron part of haemoglobin binds oxygen, not CO2.

C. The haem portion binds oxygen; CO2 binds the amino groups of the globin chains.

D. CO2 combines with haemoglobin, not with plasma proteins, to form carboxyhaemoglobin.

Question 190 Biology

Breathing consists of:

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

consists of two phases (inspiration and expiration), not four.

B. Breathing consists of two phases (inspiration and expiration), not three.

C. Breathing consists of two phases (inspiration and expiration), not one.

D. Breathing consists of inspiration (inhalation) and expiration (exhalation).

Question 191 Biology

Bowman's capsule continues as extensively convoluted portion known as:

- A. Peritubular capillaries
- B. Proximal convoluted tubules ✓ **Correct answer**
- C. Efferent arterioles
- D. Afferent arterioles

A. Peritubular capillaries are blood vessels around the tubules, not the continuation of Bowman's capsule.

B. Bowman's capsule continues as the proximal convoluted tubule.

C. The efferent arteriole carries blood away from the glomerulus; it is not the continuation of Bowman's capsule.

D. The afferent arteriole carries blood into the glomerulus; it is not the continuation of Bowman's capsule.

Note: Filed option B read "Proximal convuluted tubules" (misprint in the source reproduction); corrected to "Proximal convoluted tubules" as documented in the reviewed file.

Question 192 Biology

Restriction endonucleases cleave the _____ of duplex DNA.

- A. Nitrogenous base

e sugar

- C. Phosphodiester bond ✓ **Correct answer**
- D. Hydrogen bond

A. Restriction endonucleases cut the phosphodiester backbone, not the nitrogenous bases.

B. Restriction endonucleases cut the phosphodiester bonds, not the base-sugar linkages.

C. Restriction endonucleases cleave the phosphodiester bonds of the DNA backbone.

D. Restriction endonucleases cut the phosphodiester backbone, not the hydrogen bonds between the strands.

Question 193 Biology

The enzyme which is responsible for the formation of bond between two double stranded DNA fragments is:

- A. Endonuclease
- B. Urease
- C. Ligase ✓ **Correct answer**
- D. Helicase

A. Endonucleases cut DNA; they do not join fragments.

B. Urease breaks down urea; it does not join DNA fragments.

C. DNA ligase joins (ligates) two double-stranded DNA fragments by forming phosphodiester bonds.

D. Helicase unwinds the DNA double helix; it does not join fragments.

Question 194 Biology

The organisms of third trophic level are:

nary consumer

- B. Primary producer
- C. Tertiary consumer
- D. Secondary consumer ✓ **Correct answer**

A. Primary consumers (herbivores) are at the second trophic level.

B. Primary producers (green plants) are at the first trophic level.

C. Tertiary consumers are at the fourth trophic level.

D. Secondary consumers (carnivores that eat herbivores) are at the third trophic level.

Question 195 Biology

The ultimate source of energy in an ecosystem is:

- A. Photosynthesis
- B. Sun ✓ **Correct answer**
- C. Plants
- D. Water

A. Photosynthesis is the process that captures the sun's energy; it is not the source itself.

B. The sun is the ultimate source of energy in almost every ecosystem.

C. Plants capture solar energy; they are not the ultimate source.

D. Water is not the source of energy in an ecosystem.

Question 196 Biology

All the food chains and food webs begin with:

- A. Detritus
- B. Herbivores
- C. Green plants ✓ **Correct answer**

nivores

A. Detritus food chains begin with dead matter, but grazing food chains (the standard starting point) begin with green plants.

B. Herbivores are consumers, not the starting point of food chains.

C. Food chains and food webs begin with green plants (the producers).

D. Omnivores are consumers, not the starting point of food chains.

Question 197 Biology

The change from bare rock or open area is rapid, especially in the initial stages and follows a series of recognizable and hence predictable stages. This process is called:

- A. Pioneers
- B. Xerosere
- C. Succession ✓ **Correct answer**
- D. Secondary succession

A. Pioneers are the first organisms to colonise a bare area, not the name of the process.

B. A xerosere is succession in a dry habitat (from bare rock); the general process is succession.

C. The orderly, predictable change of communities over time (here from bare rock) is ecological succession.

D. Secondary succession starts where soil already exists (e.g. after a fire); change from bare rock is primary succession, and the general term asked for is succession.

Question 198 Biology

The decline in the thickness of ozone layer is caused by:

- A. Increasing level of nitrogen oxide

reasing level of O2

- C. Decreasing level of CFCs
- D. Increasing level of CFCs ✓ **Correct answer**

A. Nitrogen oxides contribute to ozone depletion, but the main cause named in the textbook is CFCs.

B. A decreasing level of O2 does not cause ozone depletion.

C. Decreasing CFCs would help the ozone layer recover, not deplete it.

D. Chlorofluorocarbons (CFCs) release chlorine that destroys ozone, thinning the ozone layer.

Question 199 Biology

Which one of the following is considered as strong evidence of evolution?

- A. Embryology Record
- B. Molecular Record
- C. Biochemical Record
- D. Fossil Record ✓ **Correct answer**

A. Embryology supports evolution, but the fossil record is considered the strongest evidence.

B. The molecular record supports evolution, but the fossil record is considered the strongest evidence.

C. The biochemical record supports evolution, but the fossil record is considered the strongest evidence.

D. The fossil record is considered the strongest (most direct) evidence of evolution.

200 Biology

Structures found in different species which are believed to have a common evolutionary origin are called:

- A. Homologous ✓ **Correct answer**
- B. Analogous
- C. Vestigial
- D. Fossilized

A. Structures with a common evolutionary origin (different functions) are homologous.

B. Analogous structures have similar functions but different origins.

C. Vestigial structures are reduced, non-functional remnants, not the term for common-origin structures.

D. "Fossilized" describes preserved remains, not structures with a common origin.

Question 201 Biology

Which one of the following is X-linked trait?

- A. Male pattern baldness
- B. Diabetes mellitus
- C. Haemophilia ✓ **Correct answer**
- D. Erythroblastosis fetalis

A. Male pattern baldness is an autosomal (sex-influenced) trait, not X-linked.

B. Diabetes mellitus is not an X-linked trait.

C. Haemophilia is the classic X-linked recessive trait.

D. Erythroblastosis fetalis (Rh incompatibility) is not an X-linked trait.

Note: Filed option D read "Erythroblastosis fietalis" (misprint in the source reproduction);

"Erythroblastosis fetalis" as documented in the reviewed file.

Question 202 Biology

A character determined by three alleles is:

- A. Human skin colour
- B. Human blood group ✓ **Correct answer**
- C. Human eye colour
- D. Human Rh factor

A. Human skin colour is polygenic (many genes), not determined by three alleles.

B. The ABO blood group is determined by three alleles (IA, IB, i).

C. Human eye colour is polygenic, not determined by three alleles.

D. The Rh factor is determined by two alleles (dominant/recessive), not three.

Question 203 Biology

The total number of genes in a population is called:

- A. Gene pool ✓ **Correct answer**
- B. Allele pool
- C. Genome
- D. Genomic library

A. The total number (sum) of genes in a population is the gene pool.

B. "Allele pool" is not the standard term for the total genes in a population.

C. A genome is the total genes of one individual, not of a population.

D. A genomic library is a collection of cloned DNA fragments, not the genes of a population.

204 Biology

_____ is the branch of Biology used for the identification and interpretation of fossils.

- A. Evolution
- B. Paleontology ✓ **Correct answer**
- C. Zoogeography
- D. Biodiversity

A. Evolution is the theory of change over time, not the branch that identifies fossils.

B. Paleontology is the branch of biology that identifies and interprets fossils.

C. Zoogeography studies the geographical distribution of animals, not fossils.

D. Biodiversity is the variety of life, not the branch that identifies fossils.

Question 205 Biology

Out of the given options, choose the one which shows the structures found only in plants

- A. Vacuole, Chloroplast, Ribosomes
- B. Chloroplast, Microtubules, Peroxisomes
- C. Chloroplast, Cell Wall, Vacuole ✓ **Correct answer**
- D. Chloroplast, Cell Wall, Mitochondria

A. Ribosomes are found in animal cells too, so this set is not plant-only.

B. Microtubules and peroxisomes are found in animal cells too.

C. Chloroplasts, the cell wall and the large central vacuole are found only in plant cells.

D. Mitochondria are found in animal cells too.

206 Biology

Presence of large central vacuole is the characteristic of:

- A. Prokaryotes
- B. Protists
- C. Fungi
- D. Plants ✓ **Correct answer**

A. Prokaryotes have no membrane-bound vacuole.

B. Protists may have small vacuoles, but a large central vacuole is characteristic of plant cells.

C. Fungi have vacuoles, but the large central vacuole is the characteristic feature of plant cells.

D. A large central vacuole is characteristic of plant cells.

Question 207 Biology

The basic structure of plasma membrane is provided by:

- A. Proteins
- B. Cholesterols
- C. Cytoskeleton
- D. Phospholipids ✓ **Correct answer**

A. Proteins are embedded in the membrane, but the basic structure (bilayer) is provided by phospholipids.

B. Cholesterol adds stability to the membrane, but the basic structure is the phospholipid bilayer.

C. The cytoskeleton supports the cell, but it does not provide the membrane's basic structure.

phospholipid bilayer provides the basic structure of the plasma membrane.

Question 208 Biology

The organelle involved in detoxification of drugs and poisons in the liver cells is:

- A. Smooth Endoplasmic Reticulum ✓ **Correct answer**
- B. Rough Endoplasmic Reticulum
- C. Golgi Apparatus
- D. Lysosomes

A. The smooth endoplasmic reticulum (rich in liver cells) detoxifies drugs and poisons.

B. The rough endoplasmic reticulum is for protein synthesis, not detoxification.

C. The Golgi apparatus packages and modifies proteins; it is not the detoxification organelle.

D. Lysosomes digest waste inside the cell; detoxification of drugs is the smooth ER's job.

Question 209 Biology

Down's syndrome is characterized by _____ at chromosome 21.

- A. Trisomy ✓ **Correct answer**
- B. Monosomy
- C. Polysomy
- D. Disomy

A. Down's syndrome is trisomy 21 (three copies of chromosome 21).

B. Monosomy is one copy of a chromosome, not the cause of Down's syndrome.

C. "Polysomy" is not the term for Down's syndrome (trisomy 21 is the specific form).

D. Disomy is the normal two copies, not the cause of Down's syndrome.

210 Biology

Which of the following is an example of autosomal non-disjunction?

- A. Turner's Syndrome
- B. Jacob's Syndrome
- C. Metastasis
- D. Down's syndrome ✓ **Correct answer**

A. Turner's syndrome is a sex-chromosome (X) monosomy, not an autosomal non-disjunction.

B. Jacob's (XYY) syndrome is a sex-chromosome non-disjunction, not autosomal.

C. Metastasis is the spread of cancer, not a non-disjunction.

D. Down's syndrome (trisomy 21) is non-disjunction of an autosome (chromosome 21).

Question 211 Biology

Infertility, short height, webbed neck and low hairline at lack are symptoms of _____ syndrome.

- A. Turner's ✓ **Correct answer**
- B. Down's
- C. Edward's
- D. Patau's

A. Infertility, short height, webbed neck and a low hairline are the classic symptoms of Turner's syndrome.

B. Down's syndrome has a different set of features (flat face, slanting eyes, mental retardation).

C. Edward's syndrome (trisomy 18) has a different set of features.

D. Patau's syndrome (trisomy 13) has a different set of features.

212 Biology

The concentration of sodium ions in body fluids is controlled by the hormone:

- A. Renin
- B. Aldosterone ✓ **Correct answer**
- C. Angiotensin
- D. CPK

A. Renin is an enzyme that starts the renin-angiotensin system; it does not directly control sodium concentration.

B. Aldosterone (from the adrenal cortex) controls sodium reabsorption and hence the sodium concentration in body fluids.

C. Angiotensin raises blood pressure and stimulates aldosterone release; aldosterone itself controls sodium.

D. CPK (creatine phosphokinase) is an enzyme, not a hormone controlling sodium.

Question 213 Biology

A hormone released from posterior pituitary lobe acts to be actively transport water from filtrate is collecting tubules back to kidney is shown as:

- A. Renin
- B. Antidiuretic hormone ✓ **Correct answer**
- C. Angiotensin
- D. Growth Factor

A. Renin is released by the kidney, not the posterior pituitary, and it does not reabsorb water from the collecting tubules.

B. ADH (vasopressin), released from the posterior pituitary, increases water reabsorption from the collecting tubules back into the blood.

in is part of the renin-angiotensin system; it is not the posterior-pituitary hormone that reabsorbs water.

D. Growth factor is not the posterior-pituitary hormone that reabsorbs water.

Question 214 Biology

The removal metabolic waste from the blood is called:

- A. Thermoregulation
- B. Osmoregulation
- C. Kidney Failure
- D. Excretion ✓ **Correct answer**

A. Thermoregulation is the control of body temperature, not the removal of metabolic waste.

B. Osmoregulation is the control of water and salt balance, not the removal of metabolic waste.

C. Kidney failure is a disease, not the process of removing metabolic waste.

D. The removal of metabolic waste from the blood is excretion.

Question 215 Biology

Highly toxic nitrogenous excretory product is:

- A. CO2
- B. Uric Acid
- C. Urea
- D. Ammonia ✓ **Correct answer**

A. CO2 is a respiratory waste, not a nitrogenous excretory product.

B. Uric acid is the least toxic nitrogenous waste.

s toxic than ammonia.

D. Ammonia is the most (highly) toxic nitrogenous excretory product.

Question 216 Biology

Humans have homeostatic thermostat present in a specified portion of the brain that is:

- A. Lateral ventricle
- B. Thalamus
- C. Spinal Cord
- D. Hypothalamus ✓ **Correct answer**

A. The lateral ventricle is a fluid-filled cavity, not the thermostat.

B. The thalamus is a relay station, not the body's thermostat.

C. The spinal cord is not the body's thermostat.

D. The hypothalamus is the body's homeostatic thermostat (temperature regulation centre).

Question 217 Biology

The disease in which death of small number of cells in the basal ganglia leads to inability to select and initiate patterns of movement is known as:

- A. Fever
- B. Alzheimer's Disease
- C. Epilepsy
- D. Parkinson's Disease ✓ **Correct answer**

A. Fever is a raised body temperature, not a basal-ganglia movement disorder.

B. Alzheimer's disease is a dementia (memory loss), not a basal-ganglia movement disorder.

s seizure activity, not the death of basal-ganglia cells.

D. Parkinson's disease is caused by the death of dopamine-producing cells in the basal ganglia, leading to an inability to select and initiate movements.

Question 218 Biology

A neurological disorder characterized by the decline in brain function is _____. Its symptoms are similar to those diseases that cause dementia.

- A. Parkinson's Disease
- B. Epilepsy
- C. Alzheimer's Disease ✓ **Correct answer**
- D. Diabetes

A. Parkinson's disease is a movement disorder; the dementia-like decline in brain function described here is Alzheimer's disease.

B. Epilepsy is a seizure disorder, not a progressive decline in brain function.

C. Alzheimer's disease is a progressive neurological disorder with declining brain function and dementia-like symptoms.

D. Diabetes is a metabolic disorder, not a neurological disorder with dementia-like symptoms.

Question 219 Biology

A discharge by brain which causes chaotic activity in motor and sensory areas is:

- A. Meningitis
- B. Alzheimer's Disease
- C. Epilepsy ✓ **Correct answer**
- D. Parkinson's Disease

A. Meningitis is inflammation of the brain's membranes, not a chaotic electrical discharge.

's disease is a progressive dementia, not a chaotic electrical discharge.

C. Epilepsy is a sudden chaotic electrical discharge in the brain, causing abnormal activity in motor and sensory areas.

D. Parkinson's disease is a movement disorder from basal-ganglia cell death, not a chaotic discharge.

Question 220 Biology

[Question crossed out in the printed paper: the stem and all four options are overprinted with X's and marked (X).]

- A. [Crossed out]
- B. [Crossed out]
- C. [Crossed out]
- D. [Crossed out]

No answer is given for this question, and none is taught. DEFECTIVE — excluded as DEFECTIVE, 15 Nov 2026 (decided by assistant under owner's 8 Nov 2026 delegation). The official UHS key marks this question X (cancelled), and the printed paper itself crosses the whole question out with X's (marked (X)), so its content is unrecoverable from any source — the Learnospot quiz also has no Q220 (219 items). This question must never be taught as having an answer.

A. The option is crossed out in the printed paper and unreadable.

B. The option is crossed out in the printed paper and unreadable.

C. The option is crossed out in the printed paper and unreadable.

D. The option is crossed out in the printed paper and unreadable.

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