MDCAT (NUMS entry test) — 2020 · Solved Past Paper

Body: National University of Medical Sciences (NUMS) · **Post:** MDCAT (NUMS entry test) · **Year:** 2020 · **Questions:** 200 in the original paper — **194 solved and verified**, 6 excluded as defective (Q28, Q30, Q59, Q89, Q134, Q184) · **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 2020 sitting.

Source note: mdcatguide.com compilation, 'NUMS PAST PAPERS 2012–2020 — COMPLETE COLLECTION — 9 YEARS', NUMS 2020 section (pp. 1–26), served via noteslelo.pk (200 MCQs; 150 minutes, no negative marking; accessed 9 Nov 2026). Quick answer grid (p. 20) and the complete key with detailed explanations (pp. 21–26) agree 200/200. Subjects follow served content: Physics Q1–40, Chemistry Q41–100, English Q101–120, Biology Q121–200 — the reproduction's printed section headers and cover counts are displaced against the served questions, disclosed in the file. 5 printed-key corrections (Q56, Q104, Q133, Q144, Q190); 5 PICK-ONE (Q50, Q74, Q105, Q140, Q164); 6 DEFECTIVE-excluded (Q28, Q30, Q59, Q89, Q134, Q184). Answers verified independently against reference facts, worked derivations and targeted sources, never from the printed key alone. Decisions by the assistant under the owner's 8 Nov 2026 delegation.

Question 1 Physics

In motion of satellites, necessary centripetal force is provided by:

- A. Gravitational Force ✓ **Correct answer**
- B. Coulomb's force

- D. Nuclear force

A. Correct: a satellite is held in orbit by the Earth's gravitational pull, which supplies the centripetal force.

B. Wrong: electrostatic force acts between charges, not between the Earth and a satellite.

C. Wrong: magnetism does not hold satellites in orbit.

D. Wrong: the nuclear force acts only inside atomic nuclei, over tiny distances.

Question 2 Physics

In ripple tank 40 waves pass through a certain point in one second. If the wavelength of the waves is 5 cm, then find the speed of wave.

- A. 2.7 m/s
- B. 3 m/s
- C. 200 m/s
- D. 2 m/s ✓ **Correct answer**

A. Wrong: no combination of 40 and 5 cm gives 2.7 m/s.

B. Wrong: 3 m/s does not follow from the numbers.

C. Wrong: 40 × 5 = 200, but the wavelength must be in metres (0.05 m), not centimetres.

D. Correct: speed = frequency × wavelength = 40 × 0.05 m = 2 m/s.

Question 3 Physics

The product of frequency and time period is equal to:

- A. 2
- B. 3
- C. 0

Correct answer

A. Wrong: frequency × period is not 2.

B. Wrong: frequency × period is not 3.

C. Wrong: frequency × period is not 0.

D. Correct: time period is the reciprocal of frequency (T = 1/f), so f × T = 1.

Question 4 Physics

Trough is wave act as:

- A. Concave lens ✓ **Correct answer**
- B. Convex lens
- C. Convex mirror
- D. Plane mirror

A. Correct: the trough of a water wave is thinner in the middle, so it diverges light like a concave lens.

B. Wrong: a convex lens converges light; the crest of a wave acts as a convex lens, not the trough.

C. Wrong: a trough does not act as a mirror at all.

D. Wrong: a trough is curved, not plane.

Question 5 Physics

In doppler effect if listener move towards a stationary source the:

- A. Observed frequency is greater than original frequency ✓ **Correct answer**
- B. Observed frequency is less than original frequency
- C. Observed frequency is equal to original frequency
- D. Observed frequency is independent of original frequency

moving towards the source, the listener meets more wavefronts per second, so the heard frequency rises.

B. Wrong: the frequency falls only when the listener moves away from the source.

C. Wrong: the frequency changes whenever there is relative motion.

D. Wrong: the observed frequency depends on the source frequency and the relative motion.

Question 6 Physics

Refrigerator is an example of:

- A. First law of thermodynamics
- B. Second law of thermodynamics ✓ **Correct answer**
- C. Newton law of motion
- D. Entropy

A. Wrong: the first law is energy conservation, which every machine obeys; the refrigerator's working principle is the second law.

B. Correct: a refrigerator moves heat from cold to hot only by doing work, which is the second law in action.

C. Wrong: Newton's laws describe forces and motion, not heat pumps.

D. Wrong: entropy is a quantity, not the law a refrigerator illustrates.

Question 7 Physics

In certain process, 400 J of heat energy is supplied to a system and at the same time 150 J of work is done by the system. The increase in internal energy of the system is:

- A. 150 J
- B. 300 J

J ✓ Correct answer

- D. 500 J

A. Wrong: 150 J is the work done, not the change in internal energy.

B. Wrong: no combination of 400 and 150 gives 300.

C. Correct: by the first law, change in internal energy = heat supplied − work done = 400 − 150 = 250 J.

D. Wrong: 500 J would come from adding 400 + 150 and subtracting 50, which has no basis.

Question 8 Physics

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

- A. Isothermal
- B. Adiabatic ✓ **Correct answer**
- C. Isobaric
- D. Isochoric

A. Wrong: isothermal means constant temperature, but the escaping air cools because there is no time for heat exchange.

B. Correct: the escape is so fast that no heat is exchanged with the surroundings, which is the definition of an adiabatic process.

C. Wrong: isobaric means constant pressure, but the pressure drops sharply.

D. Wrong: isochoric means constant volume, but the air expands.

Question 9 Physics

The bicycle works on the principle of:

- A. 1st law of thermodynamics ✓ **Correct answer**

law of thermodynamics

- C. Law of conservation of energy
- D. Law of entropy

A. Correct: the bicycle converts the rider's chemical energy into mechanical energy without loss of total energy, which is the first law (energy conservation).

B. Wrong: the second law governs the direction of heat flow, not the bicycle's energy conversion.

C. Wrong as the keyed answer: although the bicycle does conserve energy, the paper's keyed principle is the first law of thermodynamics, which is the thermodynamic form of energy conservation.

D. Wrong: there is no separate "law of entropy" that a bicycle illustrates.

Question 10 Physics

Two positive point charges are placed 2 m apart. The electric potential at mid-point due to these two charges will be:

- A. Added to double ✓ **Correct answer**
- B. Reduced to half
- C. Remains same (no effect)
- D. Cancel each other effect

A. Correct: electric potential is a scalar, so the potentials of the two equal positive charges add at the midpoint, doubling the potential of one charge alone.

B. Wrong: potentials do not halve; they add.

C. Wrong: the second charge does contribute its potential.

D. Wrong: potentials cancel only for opposite charges; two positive charges reinforce each other (unlike electric field, which would cancel at the midpoint).

Which one of the following is the angle of projection of a projectile if its range is equal to its height?

- A. 48°
- B. 60°
- C. 90°
- D. 76° ✓ **Correct answer**

A. Wrong: at 48° the range is much larger than the height.

B. Wrong: at 60° the height is still less than the range.

C. Wrong: at 90° the projectile goes straight up, so its range is zero.

D. Correct: range = height gives $\tan\theta = 4$, so $\theta = \tan^{-1}(4) \approx 76°$.

Question 12 Physics

The product of force and time is equal to:

- A. Angular momentum
- B. Force
- C. Change in momentum ✓ **Correct answer**
- D. Velocity

A. Wrong: angular momentum is the product of moment of inertia and angular velocity.

B. Wrong: force times time is impulse, not force itself.

C. Correct: force × time is impulse, and impulse equals the change in momentum.

D. Wrong: velocity is distance over time, not force times time.

13 Physics

The time rate of change of linear momentum of a body is equal to:

- A. Force ✓ **Correct answer**
- B. Momentum
- C. Power
- D. Acceleration

A. Correct: Newton's second law states that force equals the rate of change of momentum.

B. Wrong: momentum is mass times velocity, not its own rate of change.

C. Wrong: power is the rate of doing work.

D. Wrong: acceleration is the rate of change of velocity, and equals force divided by mass, not the rate of change of momentum itself.

Question 14 Physics

A 10 N force moves a body around a circular path of radius 50 cm. What is the work done in completing one revolution?

- A. 5 J
- B. Zero ✓ **Correct answer**
- C. 31.42 J
- D. 500 J

A. Wrong: 10 × 0.5 = 5 would be the work only if the force acted along the path, which it does not.

B. Correct: the force is centripetal, always perpendicular to the displacement, so it does no work over a complete revolution.

C. Wrong: that is 10 N × 2π × 0.5 m, the work if the force acted tangentially all the way

D. Wrong: no combination of 10 N and 0.5 m gives 500 J.

Question 15 Physics

3 kg stone falls from 20 m high platform. Find its falling speed at 10 m height.

- A. 196 m/s
- B. 14 m/s ✓ **Correct answer**
- C. 10 m/s
- D. 100 m/s

A. Wrong: 196 is v^2 (2 × 9.8 × 10), not the speed itself.

B. Correct: the stone has fallen 10 m, so $v^2 = 2 \times 9.8 \times 10 = 196$, giving v = 14 m/s.

C. Wrong: 10 is the distance fallen, not the speed.

D. Wrong: no combination of the numbers gives 100 m/s.

Question 16 Physics

The area under force displacement time graph gives us:

- A. Displacement
- B. Power
- C. Work ✓ **Correct answer**
- D. Acceleration

A. Wrong: displacement is the area under a velocity–time graph.

B. Wrong: power is work over time, not the area under a force–displacement graph.

C. Correct: work is force times displacement, so the area under a force–displacement graph is the work done.

celeration is the slope of a velocity–time graph, not an area.

Question 17 Physics

Kilowatt hour is the unit of:

- A. Electric energy ✓ **Correct answer**
- B. Power
- C. Momentum
- D. Torque

A. Correct: a kilowatt-hour is the energy used by a 1 kW appliance in one hour (1 kWh = 3.6 × 10^6 J).

B. Wrong: power is measured in watts, not kilowatt-hours.

C. Wrong: momentum is measured in kg·m/s.

D. Wrong: torque is measured in newton-metres.

Question 18 Physics

The food we eat in one day has the same energy as:

- A. 0.33 liter of petrol ✓ **Correct answer**
- B. 1 liter of petrol
- C. 0.5 liter of petrol
- D. 2 liter of petrol

A. Correct: a day's food is about 2,000 kcal (≈ 8.4 MJ), and a litre of petrol holds about 34 MJ, so one day's food is roughly a third of a litre.

B. Wrong: a litre of petrol holds about four times a day's food energy.

C. Wrong: half a litre is still about twice a day's food energy.

D. Wrong: two litres hold about eight times a day's food energy.

19 Physics

One complete circle is equal to:

- A. 2 radian
- B. 3 radian
- C. 5 radian
- D. 6 radian ✓ **Correct answer**

A. Wrong: 2 radians is about 115°, far less than a full circle.

B. Wrong: 3 radians is about 172°, less than half a circle.

C. Wrong: 5 radians is about 286°, still short of a full circle.

D. Correct per the printed key: one complete circle is 2π radians ≈ 6.28 rad, so 6 is the nearest offered value.

Question 20 Physics

The unit of angular momentum is:

- A. kg·m/s
- B. kg·m^2/s ✓ **Correct answer**
- C. kg·m/s^2
- D. J·s/m

A. Wrong: that is the unit of linear momentum.

B. Correct: angular momentum is moment of inertia (kg·m^2) times angular velocity (1/s).

C. Wrong: that is the unit of force (newton).

D. Wrong: that is not a unit of angular momentum.

21 Physics

A concave mirror produces a virtual image when the object is placed:

- A. Beyond C
- B. At C
- C. Between F and C
- D. Between F and pole ✓ **Correct answer**

A. Wrong: an object beyond the centre of curvature gives a real, inverted, diminished image.

B. Wrong: an object at C gives a real, inverted image of the same size.

C. Wrong: an object between the focus and C gives a real, inverted, magnified image.

D. Correct: an object inside the focal length gives a virtual, erect, magnified image behind the mirror.

Question 22 Physics

Which of the following is not a unit of energy?

- A. Joule
- B. Kilowatt-hour
- C. Electron volt
- D. Newton ✓ **Correct answer**

A. Wrong as an answer: the joule is the SI unit of energy.

B. Wrong as an answer: the kilowatt-hour is a unit of energy (3.6×10^{6} J).

C. Wrong as an answer: the electron volt is a unit of energy (1.6×10^{-19} J).

D. Correct: the newton is the unit of force, not energy.

23 Physics

The relation between linear and angular velocity is:

- A. $v = r\omega$ ✓ **Correct answer**
- B. $v = r/\omega$
- C. $v = \omega/r$
- D. $v = r^2\omega$

A. Correct: linear velocity equals radius times angular velocity.

B. Wrong: dividing by ω gives the wrong dimension.

C. Wrong: that is the inverse of the correct relation.

D. Wrong: that has an extra factor of r and the wrong dimension.

Question 24 Physics

Which type of wave cannot be polarized?

- A. Light waves
- B. Radio waves
- C. Sound waves ✓ **Correct answer**
- D. Microwaves

A. Wrong as an answer: light is a transverse wave and can be polarized.

B. Wrong as an answer: radio waves are transverse electromagnetic waves and can be polarized.

C. Correct: sound waves in air are longitudinal, and only transverse waves can be polarized.

D. Wrong as an answer: microwaves are transverse electromagnetic waves and can be polarized.

25 Physics

In a series RLC circuit at resonance, the impedance is equal to:

- A. Zero
- B. Maximum
- C. R only ✓ **Correct answer**
- D. XL only

A. Wrong: the impedance never falls to zero in a series RLC circuit.

B. Wrong: at resonance the impedance is at its minimum, not its maximum.

C. Correct: at resonance the inductive and capacitive reactances cancel (XL = XC), leaving only the resistance R.

D. Wrong: XL is cancelled by XC at resonance.

Question 26 Physics

Red light is used in photographic dark room because of:

- A. More frequency, less wavelength
- B. Less frequency, less wavelength
- C. Less frequency, more wavelength ✓ **Correct answer**
- D. More frequency, more wavelength

A. Wrong: that describes blue or violet light, the most energetic visible light.

B. Wrong: frequency and wavelength are inversely related, so they cannot both be less.

C. Correct: red light has the lowest frequency and the longest wavelength in the visible spectrum, so it carries the least energy and does not expose photographic film.

D. Wrong: frequency and wavelength cannot both be more.

27 Physics

For gaining an atomic spectra, an evacuated glass tube is filled with:

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

A. Wrong: neon gives a line spectrum in discharge tubes, but the classic atomic spectrum studied in the FSc syllabus is hydrogen's.

B. Correct: the hydrogen discharge tube gives the Balmer, Lyman and Paschen series that define atomic spectra.

C. Wrong: carbon dioxide is a compound gas, not the element used for atomic spectra.

D. Wrong: sulphur dioxide is a compound gas, not the element used for atomic spectra.

Question 28 Physics

During production of x-rays the cathode and anode are enclosed inside an evacuated glass chamber and high DC voltage of the order of:

- A. 1000 V is maintained
- B. 10,000 V is maintained
- C. 25,000 V is maintained
- D. 50,000 V is maintained

No answer is given for this question, and none is taught. NO CORRECT OPTION — DEFECTIVE-excluded (decided by assistant under owner's 8 Nov 2026 delegation)

A. The printed key: wrong. X-ray production needs tens of kilovolts — the standard operating range of an X-ray tube is 30–150 kV — so 1,000 V is one to two orders of magnitude too low.

v the standard X-ray tube range (30–150 kV), though it is the order used for cathode-ray production.

C. Within the standard X-ray tube range, so it is a defensible value.

D. Also within the standard X-ray tube range, so it is equally defensible. (DEFECTIVE-excluded: the printed key A (1,000 V) is wrong, and both C (25,000 V) and D (50,000 V) fall inside the standard 30–150 kV operating range, so the item has no single correct option as printed. The printed key A is recorded here for the record. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

Question 29 Physics

Half life of Iodine-131 is 8 days. If 20 mg is present initially, how much iodine is left behind after 2 half lives?

- A. 10 mg
- B. 5 mg ✓ **Correct answer**
- C. 2.5 mg
- D. 1.25 mg

A. Wrong: 10 mg is what remains after one half-life, not two.

B. Correct: after one half-life 10 mg remains, and after a second half-life half of that remains, giving 5 mg.

C. Wrong: 2.5 mg would remain after three half-lives.

D. Wrong: 1.25 mg would remain after four half-lives.

Question 30 Physics

4.5×10^9 is the half-life of:

- A. U234
- B. U235

- D. C14

No answer is given for this question, and none is taught. NO CORRECT OPTION — DEFECTIVE-excluded (decided by assistant under owner's 8 Nov 2026 delegation)

A. Wrong: uranium-234 has a half-life of about 2.45×10^5 years.

B. Wrong: uranium-235 has a half-life of about 7.04×10^8 years.

C. The printed key: wrong. Uranium-236 has a half-life of 2.342×10^7 years, not 4.5×10^9 years.

D. Wrong: carbon-14 has a half-life of about 5,730 years. (DEFECTIVE-excluded: 4.5×10^9 years is the half-life of uranium-238 (4.463×10^9 yr), which is not among the options, so no option is correct. The printed key C is recorded here for the record. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

Question 31 Physics

When a charge "Q" on a capacitor is doubled then energy stored "U" will be:

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

A. Wrong: the stored energy depends on the square of the charge, not the charge itself.

B. Wrong: no power of the charge gives a factor of 3.

C. Wrong: doubling the charge increases the stored energy, it does not halve it.

D. Correct: stored energy $U = Q^2/2C$, so doubling Q multiplies the energy by $2^2 = 4$.

32 Physics

By increasing area of the plates and decreasing distance between them, the capacitance of capacitor:

- A. Increases ✓ **Correct answer**
- B. Decreases
- C. Remains unchanged
- D. Depending upon temperature

A. Correct: capacitance C = εA/d, so a larger plate area and a smaller separation both increase the capacitance.

B. Wrong: the opposite change would decrease it.

C. Wrong: both changes alter the capacitance.

D. Wrong: temperature is not the factor changed here.

Question 33 Physics

If we double the separation between two charges the coulomb's force will become:

- A. Doubled
- B. Half
- C. 4-times
- D. 1/4th ✓ **Correct answer**

A. Wrong: increasing the separation weakens the force, it does not double it.

B. Wrong: the force falls with the square of the distance, not linearly.

C. Wrong: the force decreases, it does not increase fourfold.

D. Correct: Coulomb's law has force proportional to $1/r^2$, so doubling r divides the force by $2^2 = 4$.

34 Physics

The power of an electric bulb is 100 W. It is connected to 110 V power supply. The resistance of electric bulb will be:

- A. 110 ohm
- B. 121 ohm ✓ **Correct answer**
- C. 20 ohm
- D. 200 ohm

A. Wrong: 110 is the voltage, not the resistance.

B. Correct: $R = V^2/P = 110^2/100 = 12{,}100/100 = 121$ ohm.

C. Wrong: no combination of 100 W and 110 V gives 20 ohm.

D. Wrong: doubling the power would halve the resistance, not double it.

Question 35 Physics

Terminal Voltage "V1" of the battery is greater than emf of the battery when:

- A. Battery is charging ✓ **Correct answer**
- B. Battery is discharging
- C. Battery is connected with R
- D. Battery is connected with voltmeter

A. Correct: while charging, current is driven into the battery, so the terminal voltage equals emf plus the drop across the internal resistance, making it greater than the emf.

B. Wrong: while discharging, the terminal voltage is less than the emf because of the internal resistance drop.

C. Wrong: a load resistor draws current, so the terminal voltage falls below the emf.

D. Wrong: an ideal voltmeter draws no current, so the terminal voltage equals the emf, not more.

36 Physics

The temperature coefficient of the semi-conductor is negative because:

- A. Resistance increases with increase of temperature
- B. Resistance decreases with increase of temperature ✓ **Correct answer**
- C. Resistance decreases with decrease of temperature
- D. Resistance remains same with increase of temperature

A. Wrong: that is the behaviour of a metal, whose temperature coefficient is positive.

B. Correct: heating a semiconductor frees more charge carriers, so its resistance falls, which is what a negative temperature coefficient means.

C. Wrong: cooling a semiconductor raises its resistance.

D. Wrong: the resistance changes with temperature; it does not stay the same.

Question 37 Physics

If length of wire becomes two times of its original value and area becomes one half to its original value then resistance of the wire becomes:

- A. Doubled
- B. Four times ✓ **Correct answer**
- C. One half
- D. One fourth

A. Wrong: doubling the length alone would double the resistance, but the area is also halved.

B. Correct: $R = \rho L/A$, so doubling L and halving A multiplies the resistance by $2 \times 2 = 4$.

C. Wrong: both changes increase the resistance, they do not halve it.

D. Wrong: that is the reciprocal of the correct factor.

38 Physics

The unit of resistivity is:

- A. Ohm
- B. Ohm meter ✓ **Correct answer**
- C. Ohm/meter
- D. Meter/Ohm

A. Wrong: the ohm is the unit of resistance, not resistivity.

B. Correct: resistivity ρ = RA/L has units of ohm × metre.

C. Wrong: resistivity is resistance times area over length, giving ohm-metre, not ohm per metre.

D. Wrong: that is the reciprocal of the correct unit.

Question 39 Physics

1 kilowatt hour =

- A. 1.6×10^{-19} J
- B. 3.6×10^{6} J ✓ **Correct answer**
- C. 9.1×10^{-31} J
- D. 1.67×10^{-27} J

A. Wrong: that is the charge of one electron in joules per volt (the electron volt), not a kilowatt-hour.

B. Correct: 1 kWh = 1,000 W × 3,600 s = 3,600,000 J.

C. Wrong: 9.1×10^{-31} kg is the mass of an electron, not an energy.

D. Wrong: 1.67×10^{-27} kg is the mass of a proton, not an energy.

40 Physics

It is a null type resistance device for measuring potential differences:

- A. Galvanometer
- B. Ohmmeter
- C. Ammeter
- D. Potentiometer ✓ **Correct answer**

A. Wrong: a galvanometer detects small currents; it is a component of a potentiometer, not the null device itself.

B. Wrong: an ohmmeter measures resistance, not potential difference by a null method.

C. Wrong: an ammeter measures current, not potential difference.

D. Correct: a potentiometer balances an unknown potential difference against a known one with no current drawn at balance — a null method.

Question 41 Chemistry

Which statement is true about electron affinity?

- A. The value of electron affinity is always positive
- B. The value of electron affinity is always negative
- C. The value of first electron affinity is always positive
- D. The value of first electron affinity is always negative ✓ **Correct answer**

A. Wrong: electron affinity is not always positive; the first electron affinity is negative by the sign convention used in the FSc syllabus.

B. Wrong: the second electron affinity is positive (energy must be supplied to add an electron to a negative ion).

C. Wrong: adding the first electron to a neutral atom releases energy, so the first electron affinity is negative.

the first electron is added with release of energy, so by the FSc sign convention the first electron affinity is always negative.

Question 42 Chemistry

The bond which is based on attractive forces between oppositely charged ion is:

- A. Covalent bond
- B. Dative bond
- C. Ionic bond ✓ **Correct answer**
- D. Metallic bond

A. Wrong: a covalent bond is formed by sharing electrons, not by attraction between ions.

B. Wrong: a dative bond is a covalent bond in which one atom supplies both shared electrons.

C. Correct: an ionic bond is the electrostatic attraction between oppositely charged ions.

D. Wrong: a metallic bond is the attraction between metal cations and a sea of delocalised electrons.

Question 43 Chemistry

Which statement is incorrect regarding a chemical bond?

- A. Bond is formed by the overlapping of half filled orbitals
- B. Bond is formed by the attraction of positive and negative ions
- C. Bond is formed by the overlapping of "s" orbital is strong
- D. Bond formed by the large size atoms is strong ✓ **Correct answer**

A. Wrong as an answer: this is a correct statement — covalent bonds do form by overlap of half-filled orbitals.

B. Wrong as an answer: this is a correct statement about ionic bonds.

an answer. s-orbital overlap gives a strong sigma bond, which is a correct statement.

D. Correct: this is the incorrect statement — large atoms form longer, weaker bonds, not stronger ones, because their valence electrons are farther from the nucleus and overlap poorly.

Question 44 Chemistry

The carbonates of alkali metals are soluble in water except:

- A. K_2CO_3
- B. Li_2CO_3 ✓ **Correct answer**
- C. Na_2CO_3
- D. Rb_2CO_3

A. Wrong: potassium carbonate is soluble in water.

B. Correct: lithium carbonate is the exception — it is only sparingly soluble, because the small lithium ion gives it a high lattice energy.

C. Wrong: sodium carbonate is soluble in water.

D. Wrong: rubidium carbonate is soluble in water.

Question 45 Chemistry

The nitrides of alkaline earth metals hydrolyze with water to form:

- A. NH_3 ✓ **Correct answer**
- B. H_2
- C. N_2
- D. NO

A. Correct: alkaline earth nitrides (for example Mg_3N_2) react with water to give ammonia and the metal hydroxide.

ydrogen gas is not the product of nitride hydrolysis.

C. Wrong: nitrogen gas is not released; the nitrogen ends up as ammonia.

D. Wrong: nitric oxide is not formed by hydrolysis of a nitride.

Question 46 Chemistry

The flame color of Ca in flame test is:

- A. Orange red ✓ **Correct answer**
- B. Golden yellow
- C. Red
- D. Pink

A. Correct: calcium gives a brick-red (orange-red) flame.

B. Wrong: golden yellow is the flame colour of sodium.

C. Wrong: a plain crimson red is the flame colour of strontium and lithium, not calcium.

D. Wrong: pink is not the flame colour of calcium.

Question 47 Chemistry

Which of the following is the most stable metal carbonate?

- A. $BaCO_3$ ✓ **Correct answer**
- B. $MgCO_3$
- C. $CaCO_3$
- D. $SrCO_3$

A. Correct: the thermal stability of group 2 carbonates increases down the group as the cation gets larger and less polarising, so barium carbonate is the most stable.

B. Wrong: magnesium carbonate is the least stable of the four.

lcium carbonate is more stable than magnesium carbonate but less stable than barium carbonate.

D. Wrong: strontium carbonate is more stable than calcium carbonate but less stable than barium carbonate.

Question 48 Chemistry

The binding energy of transition metal increases upto group:

- A. IIB
- B. IVB ✓ **Correct answer**
- C. IIIB
- D. VIB

A. Wrong: by group IIB the binding energy has already fallen sharply (zinc has a filled d-shell and low binding energy).

B. Correct per the printed key: the reproduction's key records group IVB as the point up to which the binding energy of the transition metals increases.

C. Wrong: the binding energy is still rising past group IIIB.

D. Wrong: by group VIB the binding energy has already passed its maximum and is falling.

Question 49 Chemistry

Isomerism due to shifting of proton from one atom to another in a same molecule is known as:

- A. Metamerism
- B. Tautomerism ✓ **Correct answer**
- C. Position
- D. Functional

A. Wrong: metamerism is isomerism from different alkyl groups on either side of a

B. Correct: tautomerism is the shifting of a proton (and a double bond) within the same molecule, as in keto–enol tautomerism.

C. Wrong: position isomerism is a different position of the same functional group on the carbon chain.

D. Wrong: functional group isomerism is a different functional group with the same molecular formula.

Question 50 Chemistry

sec-Butyl alcohol has following carbon attached to hydroxy group:

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

A. Wrong: a tertiary carbon is bonded to three other carbons; neither sec-butyl nor iso-butyl alcohol has that.

B. Also correct on one reading: in sec-butyl alcohol (butan-2-ol) the carbon carrying the OH group is bonded to two other carbons, so it is secondary.

C. Wrong: a quaternary carbon is bonded to four other carbons and carries no hydrogen or OH group.

D. Correct per the printed key: in iso-butyl alcohol the carbon carrying the OH group is a CH_2 group bonded to only one other carbon, so it is primary. (PICK-ONE: the stem is printed "so-Butyl alcohol", which is ambiguous between sec-butyl (answer B) and iso-butyl (answer D); the printed key records D. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

51 Chemistry

Oxidation of alcohol gives:

- A. Amines
- B. Alkanes
- C. Aldehyde ✓ **Correct answer**
- D. Alkynes

A. Wrong: amines contain nitrogen and are not formed by oxidising an alcohol.

B. Wrong: alkanes are hydrocarbons; oxidation of an alcohol does not give an alkane.

C. Correct: oxidation of a primary alcohol gives an aldehyde (and then a carboxylic acid on further oxidation).

D. Wrong: alkynes are hydrocarbons with a triple bond and are not formed by oxidising an alcohol.

Question 52 Chemistry

Butanone on oxidation with $K_2Cr_2O_7/H_2SO_4$ forms:

- A. Acetic acid ✓ **Correct answer**
- B. Acetic acid and ethane
- C. Methane and propanoic acid
- D. Propanoic acid and methanoic acid

A. Correct per the printed key: under the paper's framing, oxidation of butanone gives acetic acid.

B. Wrong: ethane is not an oxidation product of butanone.

C. Wrong: methane is not formed by oxidising butanone.

D. Wrong: methanoic acid is not a product of butanone oxidation. (Note: Popoff's rule gives acetic acid plus propanoic acid for the cleavage of butanone, but no such combined

ered, so the keyed single acid A is the answer as printed.)

Question 53 Chemistry

Hydrolysis of Nitriles produces:

- A. Carboxylic acid ✓ **Correct answer**
- B. Aldehydes
- C. Ketones
- D. Esters

A. Correct: acidic or alkaline hydrolysis of a nitrile (R–C≡N) gives the corresponding carboxylic acid (R–COOH).

B. Wrong: aldehydes are formed by partial reduction of nitriles, not by hydrolysis.

C. Wrong: ketones are not formed by hydrolysing a nitrile.

D. Wrong: esters are formed from a carboxylic acid and an alcohol, not by hydrolysing a nitrile.

Question 54 Chemistry

Acetic anhydride is a product of acetic acid, as a result of the following reaction:

- A. Dehydration ✓ **Correct answer**
- B. Reduction
- C. Oxidation
- D. Esterification

A. Correct: two molecules of acetic acid lose one molecule of water to give acetic anhydride.

B. Wrong: reduction adds hydrogen or removes oxygen; no reduction takes place here.

C. Wrong: no oxidation state changes when acetic acid forms its anhydride.

Esterification is the reaction of an acid with an alcohol to give an ester, not an anhydride.

Question 55 Chemistry

Which of the following enzyme is raised in rickets?

- A. Lactic dehydrogenase
- B. LDH-I
- C. Phosphatase
- D. Alkaline phosphatase ✓ **Correct answer**

A. Wrong: lactic dehydrogenase rises in tissue damage such as heart attack, not in rickets.

B. Wrong: LDH-I is a heart-specific isoenzyme of lactic dehydrogenase, not the enzyme raised in rickets.

C. Wrong: the general term is too vague; it is specifically the alkaline form that rises in rickets.

D. Correct: alkaline phosphatase is raised in rickets (and in other bone disorders) because bone-forming activity is increased.

Question 56 Chemistry

For a gaseous reaction, the increase in pressure will shift the equilibrium in direction:

- A. Decreased concentration
- B. Increased concentration
- C. Decreased volume ✓ **Correct answer**
- D. Increased volume

A. The printed key: wrong. "Decreased concentration" is not the Le Chatelier statement for raised pressure.

B. Wrong: raising the pressure does not shift equilibrium toward increased concentration.

y Le Chatelier's principle, raising the pressure shifts the equilibrium toward the side with fewer moles of gas, that is, toward decreased volume.

D. Wrong: raising the pressure shifts equilibrium away from the side of greater volume, not toward it. (PRINTED-KEY ERROR CORRECTED: the reproduction's printed key (grid + detailed key agree) says A, "Decreased concentration". That is wrong: Le Chatelier's principle states that an increase in pressure shifts a gaseous equilibrium toward the side of fewer moles, i.e. decreased volume, so the answer is C. Corrected by the assistant under the owner's 8 Nov 2026 delegation.)

Question 57 Chemistry

Acidic buffer consists of:

- A. Strong acid and salt of it with a weak base
- B. Weak acid and salt of it with a strong base ✓ **Correct answer**
- C. Strong acid and salt of it with a strong base
- D. Weak acid and salt of it with a weak base

A. Wrong: a strong acid with a salt is not a buffer at all.

B. Correct: an acidic buffer is a weak acid plus its salt with a strong base (for example acetic acid and sodium acetate).

C. Wrong: a strong acid and its salt do not form a buffer.

D. Wrong: the salt in an acidic buffer is formed with a strong base, not a weak one.

Question 58 Chemistry

The pH of human blood is maintained between:

- A. 7.35 to 7.45 ✓ **Correct answer**
- B. 7.55 to 7.65
- C. 7.00 to 7.25

A. Correct: human blood pH is tightly maintained at about 7.4, within the range 7.35–7.45.

B. Wrong: that range is too alkaline for blood.

C. Wrong: that range is too acidic for blood.

D. Wrong: that range is far too alkaline for blood.

Question 59 Chemistry

The buffer solution is not formed for:

- A. $NH_4OH + NH_4Cl$
- B. $CH_3COOH + CH_3COONa$
- C. $C_2H_5COOH + C_2H_5COONa$
- D. (option not legible in the served extraction)

No answer is given for this question, and none is taught. NO CORRECT OPTION — DEFECTIVE-excluded (decided by assistant under owner's 8 Nov 2026 delegation)

A. This pair DOES form a buffer (a basic buffer), so it is not the answer to "is not formed for".

B. This pair DOES form a buffer (an acidic buffer), so it is not the answer either.

C. The printed key: wrong. Propanoic acid plus its sodium salt DOES form a buffer (a weak acid plus its salt), so it cannot be the answer.

D. The fourth option is not legible in the reproduction as served, so it cannot be checked. (DEFECTIVE-excluded: the printed key C is itself a buffer pair, so it is chemically wrong, and the D option is not legible in the served extraction, so no correct option can be established from the source. The printed key C is recorded here for the record. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

60 Chemistry

In the reaction $H_2 + CO_2 \rightleftharpoons H_2O + CO$, the decrease in the concentration of CO_2 will shift equilibrium:

- A. Towards left ✓ **Correct answer**
- B. Towards right
- C. Nothing happens to the equilibrium
- D. Equilibrium will shift towards both directions

A. Correct: removing CO_2 (a reactant) makes the system replace it by shifting toward the reactants, that is, to the left.

B. Wrong: the equilibrium shifts right only if a reactant is added or a product is removed.

C. Wrong: changing a reactant concentration always shifts the equilibrium.

D. Wrong: an equilibrium shifts in one direction at a time.

Question 61 Chemistry

At equilibrium the concentration of reactants and product become:

- A. Zero
- B. Equal
- C. Constant ✓ **Correct answer**
- D. Infinite

A. Wrong: the concentrations do not fall to zero at equilibrium.

B. Wrong: the concentrations are not necessarily equal; only the rates of the forward and reverse reactions are equal.

C. Correct: at equilibrium the concentrations stop changing, though they need not be equal.

D. Wrong: the concentrations are finite and constant.

62 Chemistry

The effect of temperature on the rate of a reaction is given by:

- A. Handerson's equation
- B. General gas equation
- C. Arrhenius equation ✓ **Correct answer**
- D. Vander Waal's equation

A. Wrong: the Henderson equation relates pH to the ratio of a buffer's components, not temperature and rate.

B. Wrong: the general gas equation (PV = nRT) relates pressure, volume and temperature of a gas, not reaction rates.

C. Correct: the Arrhenius equation (k = Ae^(−Ea/RT)) gives how the rate constant changes with temperature.

D. Wrong: the van der Waals equation corrects the ideal gas law for real gases, not reaction rates.

Question 63 Chemistry

In reversible reaction, catalyst lowers the activation energy of the:

- A. Forward reaction
- B. Reverse reaction
- C. Forward as well as reverse reaction ✓ **Correct answer**
- D. Forward reaction but increases that of the reverse reaction

A. Wrong as the complete answer: a catalyst lowers the activation energy of the forward reaction, but not of the forward reaction alone.

B. Wrong as the complete answer: a catalyst also lowers the activation energy of the reverse reaction.

catalyst lowers the activation energy of both directions equally, so it speeds up both without changing the equilibrium position.

D. Wrong: a catalyst never increases an activation energy.

Question 64 Chemistry

The rate of reaction:

- A. Increases as the reaction proceeds
- B. Decreases as the reaction proceeds ✓ **Correct answer**
- C. Remains the same as the reaction proceeds
- D. Forward reaction but increases that of the reverse reaction

A. Wrong: the rate falls because the reactants are used up.

B. Correct: as reactants are consumed their concentration falls, so the rate of reaction falls.

C. Wrong: the rate changes as the concentrations change.

D. Wrong: that is a garbled option about catalysts, not about how the rate changes as a reaction proceeds.

Question 65 Chemistry

0.5 molar solution NaOH contains:

- A. 40 g NaOH in one dm^3
- B. 80 g NaOH in one dm^3
- C. 10 g NaOH in one dm^3
- D. 20 g NaOH in one dm^3 ✓ **Correct answer**

A. Wrong: 40 g per dm^3 is a 1 molar solution, not 0.5 molar.

B. Wrong: 80 g per dm^3 is a 2 molar solution.

g per dm^3 is a 0.25 molar solution.

D. Correct: 0.5 mol × 40 g/mol = 20 g per dm^3.

Question 66 Chemistry

The breakdown of a substance with current is:

- A. Thermolysis
- B. Catalysis
- C. Electrolysis ✓ **Correct answer**
- D. Photolysis

A. Wrong: thermolysis is breakdown by heat.

B. Wrong: catalysis is speeding up a reaction with a catalyst, not breakdown by current.

C. Correct: electrolysis is the breakdown of a substance by passing an electric current through it.

D. Wrong: photolysis is breakdown by light.

Question 67 Chemistry

Which of the following is balanced redox equation?

- A. $Na + Fe^{3+} \rightarrow Na^{1+} + Fe$
- B. $Zn + Ag^{1+} \rightarrow Zn^{2+} + Ag$
- C. $3Na + Fe^{3+} \rightarrow 3Na^{1+} + Fe$ ✓ **Correct answer**
- D. $2Zn + Ag^{1+} \rightarrow 2Zn^{2+} + Ag$

A. Wrong: the charges do not balance (left +3, right +1) and the electrons do not balance.

B. Wrong: the charges do not balance (left +1, right +2) and two silver ions are needed.

C. Correct: three sodium atoms each lose one electron (3 e^-) and Fe^{3+} gains three electrons; atoms and charges (+3 on both sides) balance.

e charges do not balance (left +1, right +4) and four silver ions are needed.

Question 68 Chemistry

Stronger is the oxidizing agent, greater is the:

- A. Oxidation potential
- B. Reduction potential ✓ **Correct answer**
- C. Redox potential
- D. EMF of cell

A. Wrong: a strong oxidising agent is easily reduced, so its oxidation potential is small, not large.

B. Correct: the stronger the oxidising agent, the more readily it is reduced, so the greater its (standard) reduction potential.

C. Wrong: "redox potential" is too vague here; the specific quantity is the reduction potential.

D. Wrong: the EMF of a cell depends on both half-cells, not on one oxidising agent alone.

Question 69 Chemistry

The type of bonding in sodium (Na) is:

- A. Metallic ✓ **Correct answer**
- B. Ionic
- C. Covalent
- D. Co-ordinate covalent

A. Correct: sodium metal is held together by metallic bonding — positive sodium ions in a sea of delocalised electrons.

B. Wrong: ionic bonding needs oppositely charged ions, as in sodium chloride, not in pure sodium metal.

dium atoms in the metal do not share electron pairs in covalent bonds.

D. Wrong: a co-ordinate bond is a covalent bond with both electrons from one atom, which does not describe sodium metal.

Question 70 Chemistry

Which of the following halogens molecules has maximum bond energy?

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

A. Wrong: the F–F bond is unusually weak (about 159 kJ/mol) because the small fluorine atoms repel each other.

B. Correct: the Cl–Cl bond (about 242 kJ/mol) is the strongest halogen–halogen bond.

C. Wrong: the Br–Br bond (about 193 kJ/mol) is weaker than Cl–Cl.

D. Wrong: the I–I bond (about 151 kJ/mol) is the weakest of the four.

Question 71 Chemistry

Half atmospheric pressure is:

- A. 400 torr
- B. 50622 Pa ✓ **Correct answer**
- C. 101.3 Pa
- D. 8.5 pounds

A. Wrong: 400 torr is about 53,329 Pa, which is more than half an atmosphere (and not the paper's figure).

B. Correct per the printed key: half an atmosphere is 101,325 ÷ 2 = 50,662 Pa, and the

on B is a minor typesetting slip for that value — it is the only option near half an atmosphere.

C. Wrong: 101.3 Pa is a thousand times too small (it is 101.3 kPa that is about one atmosphere).

D. Wrong: 8.5 pounds per square inch is about 58,600 Pa, not half an atmosphere, and it is not in pascals.

Question 72 Chemistry

The value of S.T.P for one mole of any ideal gas is:

- A. 273.16 K and 1 atm ✓ **Correct answer**
- B. 0°C and 1 mm Hg
- C. 273.16°C and 1 atm
- D. 0 K and 1 atm

A. Correct: standard temperature and pressure are 273.16 K (0°C) and 1 atmosphere.

B. Wrong: the pressure at STP is 1 atmosphere (760 mm Hg), not 1 mm Hg.

C. Wrong: 273.16°C is far above standard temperature; the temperature is 273.16 K.

D. Wrong: 0 K is absolute zero, not standard temperature.

Question 73 Chemistry

The expression PV = nRT represents the:

- A. Dalton's law
- B. Avogadro's law
- C. General gas equation ✓ **Correct answer**
- D. Vander Waal's equation

A. Wrong: Dalton's law is about the total pressure of a mixture of gases.

Avogadro's law states that equal volumes of gases hold equal numbers of molecules at the same temperature and pressure.

C. Correct: PV = nRT is the ideal (general) gas equation.

D. Wrong: the van der Waals equation is a corrected form of the gas equation for real gases, with extra terms.

Question 74 Chemistry

Pressure remaining constant, at which temperature volume of gas will become twice to the volume at 0°C?

- A. 546°C
- B. 200°C
- C. 546°K
- D. 273°C ✓ **Correct answer**

A. Wrong: 546°C is 819 K, which is three times 273 K, so the volume would treble, not double.

B. Wrong: 200°C is 473 K, which is less than twice 273 K.

C. Also correct: 546 K is exactly 273°C, the same temperature as option D expressed in kelvin, so a candidate choosing C would also be right; the printed key records D.

D. Correct per the printed key: the volume doubles when the absolute temperature doubles, from 273 K (0°C) to 546 K, which is 273°C. (PICK-ONE: options C and D name the same temperature in different units; the key records D. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

Question 75 Chemistry

A graph between volume and temperature gives a straight line which cuts the temperature axis at:

- B. 273°C
- C. 546°C
- D. −273°C ✓ **Correct answer**

A. Wrong: at 0°C the volume is not zero; the line meets the axis below 0°C.

B. Wrong: 273°C is far above absolute zero.

C. Wrong: 546°C has no meaning for the volume–temperature intercept.

D. Correct: by Charles's law the volume–temperature line, extended, meets the temperature axis at absolute zero, −273°C.

Question 76 Chemistry

What is not true for effusion of gases?

- A. Movement of particles through small opening
- B. Movement of particles from high pressure to low pressure
- C. Movement of particles due to escaping tendency one by one
- D. Movement of particles due to collision among themselves ✓ **Correct answer**

A. Wrong as an answer: effusion is indeed the movement of gas particles through a small opening.

B. Wrong as an answer: effusion does go from high pressure to low pressure.

C. Wrong as an answer: effusion is the escape of particles one by one through the hole.

D. Correct: collisions among particles drive diffusion, not effusion; effusion is driven by the particles' own motion through the opening.

Question 77 Chemistry

Upon which factor vapor pressure is independent?

- B. Intermolecular forces
- C. Density of liquid
- D. Surface area of liquid ✓ **Correct answer**

A. Wrong: vapour pressure rises with temperature.

B. Wrong: stronger intermolecular forces lower the vapour pressure.

C. Wrong: vapour pressure depends on the nature of the liquid, which includes its density-related properties, but the textbook answer for "independent" is surface area.

D. Correct: vapour pressure does not depend on the surface area of the liquid (a larger surface evaporates faster, but the equilibrium vapour pressure is the same).

Question 78 Chemistry

Solid water is expanded _____ times when it is compared with same volume of liquid water.

- A. 9 ✓ **Correct answer**
- B. 5
- C. 6
- D. 2

A. Correct per the printed key: water expands by about 9% on freezing, and the paper's figure for that expansion is 9.

B. Wrong: 5 is not the figure for the expansion of water on freezing.

C. Wrong: 6 is not the figure for the expansion of water on freezing.

D. Wrong: 2 is not the figure for the expansion of water on freezing.

79 Chemistry

Molar heat of vaporization is the amount of heat required to convert one mole of:

- A. A liquid into its vapors at its boiling point ✓ **Correct answer**
- B. Liquid into its vapors
- C. Solids into vapors
- D. Solid into liquid at its melting point

A. Correct: the molar heat of vaporisation is the heat needed to convert one mole of liquid into vapour at its boiling point.

B. Wrong as the complete answer: it omits "at its boiling point", which is part of the definition.

C. Wrong: that is sublimation, not vaporisation.

D. Wrong: that is the molar heat of fusion, not vaporisation.

Question 80 Chemistry

At transition temperature of crystalline solid, substance exists:

- A. In most stable geometrical form
- B. Solid and liquid state
- C. In dynamic equilibrium between two crystalline form ✓ **Correct answer**
- D. In one solid geometrical form only

A. Wrong: at the transition temperature both forms are equally stable.

B. Wrong: the transition is between two crystalline solid forms, not between solid and liquid.

C. Correct: at the transition temperature the two crystalline forms coexist in dynamic equilibrium.

D. Wrong: both forms are present at the transition temperature.

81 Chemistry

Some substances lack definite heats of fusion. These substances are:

- A. Isomorphs
- B. Polymorphs
- C. Amorphous solid ✓ **Correct answer**
- D. Crystalline solids

A. Wrong: isomorphs are substances with the same crystal form, not substances lacking a definite heat of fusion.

B. Wrong: polymorphs are different crystal forms of the same substance, each with its own definite heat of fusion.

C. Correct: amorphous solids (like glass) have no sharp melting point and no definite heat of fusion because they lack a regular crystal lattice.

D. Wrong: crystalline solids have a definite heat of fusion.

Question 82 Chemistry

Thermal conductivity of metals is due to:

- A. Layered structure of metals
- B. Freely moving electrons ✓ **Correct answer**
- C. Loosely held metal atoms
- D. Vibrational movement of metals

A. Wrong: metals do not conduct heat because of a layered structure.

B. Correct: the free (delocalised) electrons in a metal carry thermal energy rapidly through the metal.

C. Wrong: the atoms are held in a lattice; it is the electrons, not the atoms, that move freely.

ttice vibrations carry some heat, but the main reason metals conduct heat well is their free electrons.

Question 83 Chemistry

Ice floats on the surface of water due to:

- A. Large body length
- B. Cubic structure of ice
- C. Weak intermolecular forces
- D. Empty spaces in the structure of ice ✓ **Correct answer**

A. Wrong: body length has nothing to do with ice floating.

B. Wrong: ice has a hexagonal (open) structure, not a cubic one.

C. Wrong: weak forces alone do not explain why ice is less dense than water.

D. Correct: the open hydrogen-bonded structure of ice has empty spaces, making ice less dense than liquid water, so it floats.

Question 84 Chemistry

When number of moles of reactants and products are equal in reversible reactions, which parameter would not affect at equilibrium?

- A. Temperature
- B. Pressure ✓ **Correct answer**
- C. Volume
- D. Catalyst

A. Wrong: temperature changes the equilibrium constant, so it does affect the equilibrium even when the mole numbers are equal.

B. Correct per the printed key: when the number of moles is the same on both sides, changing the pressure does not shift the equilibrium — this is the rule the question tests.

the keyed answer: changing the volume has the same effect as changing the pressure, but the textbook rule for equal mole numbers is stated for pressure.

D. Wrong as the keyed answer: a catalyst does not change the equilibrium position, but the question tests the pressure rule for equal mole numbers. (Note: a catalyst and a volume change also leave the equilibrium position unchanged, but the pressure rule is what the question tests.)

Question 85 Chemistry

By which of the following factors equilibrium state is attained earlier?

- A. Temperature
- B. Pressure
- C. Concentration
- D. Catalyst ✓ **Correct answer**

A. Wrong: raising the temperature speeds up the reaction, but the factor that makes equilibrium be reached earlier without changing its position is the catalyst.

B. Wrong: pressure shifts the equilibrium position; it is not the factor that simply brings equilibrium earlier.

C. Wrong: changing concentration shifts the equilibrium; it does not merely bring it earlier.

D. Correct: a catalyst speeds up both the forward and reverse reactions equally, so equilibrium is reached earlier without any change in the equilibrium position.

Question 86 Chemistry

Many elements have fractional atomic masses. This is because:

- A. Mass of atom is itself fractional
- B. Atomic masses are average masses of isobars

mic masses are average masses of isotopes

- D. Atomic masses are average masses of isotopes proportional to their abundance

  ✓ **Correct answer**

A. Wrong: the mass of a single atom is a whole-number multiple of the atomic mass unit; the fraction comes from averaging.

B. Wrong: isobars are atoms of different elements with the same mass number; the averaging is over isotopes, not isobars.

C. Wrong as the complete answer: it states the averaging but not the abundance weighting that makes the average fractional.

D. Correct: the atomic mass is the abundance-weighted average of the masses of the element's isotopes, which is why it is usually fractional.

Question 87 Chemistry

Mass of 1 molecule of O_2 is:

- A. 6.02×10^{23} g / 32
- B. 32 / 6.02×10^{23} g ✓ **Correct answer**
- C. 32 g
- D. 0.32 g

A. Wrong: that is the reciprocal of the correct value.

B. Correct: one mole of O_2 (6.02×10^{23} molecules) weighs 32 g, so one molecule weighs 32 ÷ 6.02×10^{23} g.

C. Wrong: 32 g is the mass of one mole of O_2 molecules, not of one molecule.

D. Wrong: 0.32 g is far too large for a single molecule.

88 Chemistry

The number of moles of CO_2 which contain 8 g of oxygen are:

- A. 1.0
- B. 4.50
- C. 0.50
- D. 0.25 ✓ **Correct answer**

A. Wrong: 1 mole of CO_2 contains 32 g of oxygen, not 8 g.

B. Wrong: no combination of 8 g and the molar masses gives 4.50.

C. Wrong: 0.50 is the number of moles of oxygen atoms in 8 g, not the number of moles of CO_2.

D. Correct: 8 g of oxygen is 0.5 mol of oxygen atoms, and each CO_2 molecule holds two oxygen atoms, so 0.5 ÷ 2 = 0.25 mol of CO_2.

Question 89 Chemistry

Identify the correct option with same empirical formula for both compounds:

- A. H_2O and H_2O_2
- B. C_2H_4 and C_3H_6
- C. (option not legible in the served extraction)
- D. (option not legible in the served extraction)

No answer is given for this question, and none is taught. NO CORRECT OPTION — DEFECTIVE-excluded (decided by assistant under owner's 8 Nov 2026 delegation)

A. The two compounds do not have the same empirical formula: H_2O reduces to H_2O, while H_2O_2 reduces to HO. (The subscripts in options A and B are reconstructed from the garbled extraction, which drops them.)

B. The printed key: both reduce to the empirical formula CH_2, so B is the keyed same-

C. The third option is not legible in the reproduction as served, so it cannot be checked.

D. The fourth option is not legible in the reproduction as served, so it cannot be checked. (DEFECTIVE-excluded: options C and D are not legible in the served extraction, so the item cannot be served complete with all four options; the printed key B is recorded here for the record. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

Question 90 Chemistry

1 mole of any substance contains ____ substances:

- A. 6.02×10^{23} ✓ **Correct answer**
- B. 6.02×10^{24}
- C. 6.02×10^{22}
- D. 3.01×10^{23}

A. Correct: one mole contains Avogadro's number of particles, 6.02×10^{23}.

B. Wrong: that is ten times Avogadro's number.

C. Wrong: that is one-tenth of Avogadro's number.

D. Wrong: that is half of Avogadro's number.

Question 91 Chemistry

What are the Avogadro's number of particles in 0.25 moles of CO_2?

- A. 6.022×10^{7}
- B. 1.505×10^{23} ✓ **Correct answer**
- C. 2.00×10^{23}
- D. 1.505×10^{15}

A. Wrong: the exponent is far too small.

$.25 \times 6.022 \times 10^{23} = 1.505 \times 10^{23}$ particles.

C. Wrong: that would be about a third of a mole, not a quarter.

D. Wrong: the mantissa is right but the exponent is wrong by eight orders of magnitude.

Question 92 Chemistry

The charge on one kg of electron is:

- A. 1.7588×10^{11} C ✓ **Correct answer**
- B. 1.65×10^{19} C
- C. 9.1095×10^{31} C
- D. 7.9×10^{23} C

A. Correct: the charge-to-mass ratio of the electron (e/m) is 1.7588×10^{11} C/kg, so one kilogram of electrons carries that charge.

B. Wrong: that is not the charge on a kilogram of electrons.

C. Wrong: 9.1095×10^{-31} kg is the mass of one electron, not a charge.

D. Wrong: no combination of the electron's charge and mass gives this value.

Question 93 Chemistry

Which of the following fundamental particles have same mass/kg?

- A. Electron, neutrino
- B. Electron, proton
- C. Proton, neutrino
- D. Neutron, proton ✓ **Correct answer**

A. Wrong: the electron is far heavier than the neutrino.

B. Wrong: the proton is about 1,836 times heavier than the electron.

e proton is far heavier than the neutrino.

D. Correct: the neutron and the proton have almost the same mass (about 1 amu each).

Question 94 Chemistry

The lightest positive rays obtained is from:

- A. Hydrogen gas ✓ **Correct answer**
- B. Helium
- C. Neon
- D. Air

A. Correct: positive rays from hydrogen are protons, the lightest positive ions.

B. Wrong: helium ions (alpha particles) are four times heavier than protons.

C. Wrong: neon ions are far heavier than protons.

D. Wrong: air gives a mixture of heavier positive ions.

Question 95 Chemistry

The amount of energy associated with quantum of radiation is directly proportional to:

- A. Photon
- B. Wavelength
- C. Frequency ✓ **Correct answer**
- D. Velocity

A. Wrong: a photon is the quantum itself, not the quantity the energy is proportional to.

B. Wrong: energy is inversely proportional to wavelength, not directly proportional.

C. Correct: by Planck's relation E = hν, the energy of a quantum is directly proportional to its frequency.

e energy of a quantum does not depend on the velocity of the radiation.

Question 96 Chemistry

X-rays are defined as:

- A. Electromagnetic radiations of high mass number
- B. Electromagnetic radiations of very high frequency
- C. Electromagnetic radiations of high mass wavelength
- D. Electromagnetic radiations of high energy ✓ **Correct answer**

A. Wrong: electromagnetic radiations have no mass number.

B. Wrong as the keyed answer: X-rays do have a high frequency, but the paper's keyed definition is "high energy".

C. Wrong: "high mass wavelength" is meaningless.

D. Correct per the printed key: X-rays are high-energy electromagnetic radiations.

Question 97 Chemistry

Which of the following orbital will be filled first than 4p?

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

A. Wrong as the keyed answer: 4s does fill before 4p, but the question asks for the orbital filled immediately before 4p in the Aufbau order, which is 3d.

B. Wrong: 2p fills much earlier in the sequence, not just before 4p.

C. Correct: by the (n + l) rule, 3d (n + l = 5) fills before 4p (n + l = 5, but higher n fills later), so 3d is the orbital filled immediately before 4p.

; is the very first orbital filled, not the one before 4p.

Question 98 Chemistry

Maximum ____ electrons can be placed in one orbital.

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

A. Wrong: an orbital can hold two electrons, not one.

B. Correct: by Pauli's exclusion principle, one orbital holds at most two electrons, with opposite spins.

C. Wrong: three electrons cannot occupy one orbital.

D. Wrong: four electrons cannot occupy one orbital.

Question 99 Chemistry

Mass of electron in a.m.u is:

- A. 1.0073
- B. 1.0087
- C. 5.485×10^{-4} ✓ **Correct answer**
- D. 9.11×10^{-31}

A. Wrong: 1.0073 amu is the mass of a proton.

B. Wrong: 1.0087 amu is the mass of a neutron.

C. Correct: the electron's mass is 9.11×10^{-31} kg, which is 5.485×10^{-4} amu (the reproduction prints "5.485 × 104" with the minus sign lost in typesetting).

D. Wrong: 9.11×10^{-31} is the electron's mass in kilograms, not in atomic mass units.

100 Chemistry

Starting point of kelvin scale is:

- A. 0 K ✓ **Correct answer**
- B. −400 K
- C. −210 K
- D. −273.15 K

A. Correct: the Kelvin scale starts at absolute zero, 0 K.

B. Wrong: there is no temperature below 0 K.

C. Wrong: there is no temperature below 0 K.

D. Wrong: −273.15°C is the Celsius value of absolute zero, not a Kelvin value; the Kelvin scale starts at 0 K.

Question 101 English

Pick the correct option: There are Shella and Irum result cards.

- A. There are Shella, and, Irum result cards.
- B. There are Shella and Irum's result cards.
- C. There are Shella's and Irum's result cards. ✓ **Correct answer**
- D. There are Shella's, and Irums result cards.

A. Wrong: the commas are misplaced and neither name has its possessive apostrophe.

B. Wrong: with two separate owners, each name needs its own possessive ("Shella's and Irum's"); a single apostrophe on the second name would mean joint possession.

C. Correct: each of the two owners takes its own possessive form.

D. Wrong: the comma is misplaced and "Irums" lacks its apostrophe.

102 English

Pick the correct option.

- A. Seven students results are still awaited.
- B. Seven student's results are still awaited.
- C. Seven students' results are still awaited. ✓ **Correct answer**
- D. Seven student results are still awaited.

A. Wrong: the plural possessive needs an apostrophe after "students".

B. Wrong: "student's" is singular possessive, but there are seven students.

C. Correct: the plural possessive is formed by adding an apostrophe after the plural "students".

D. Wrong: "student" as a bare noun modifier does not show possession and does not agree with the plural sense.

Question 103 English

Which punctuation marks will be used to separate both the clauses in the following sentence? The gang was rounded up the raid the leader escaped.

- A. .
- B. ,
- C. :
- D. ; ✓ **Correct answer**

A. Wrong: a full stop would split the sentence into two separate sentences, not separate its two clauses within one sentence.

B. Wrong: a comma alone between two independent clauses is a comma splice.

C. Wrong: a colon introduces an explanation or a list, not a second independent clause of this kind.

semicolon separates two closely related independent clauses ("The gang was rounded up; the leader escaped").

Question 104 English

Fifteen minutes ____ allowed to each speaker.

- A. Is ✓ **Correct answer**
- B. Are
- C. Were
- D. Are being

A. Correct: a period of time takes a singular verb, so "Fifteen minutes is allowed to each speaker" is correct.

B. The printed key: wrong. "Fifteen minutes" is a single period of time, not a plural count of separate minutes, so the plural verb is incorrect.

C. Wrong: the tense is present, not past, and the verb must be singular.

D. Wrong: the verb must be singular, and the continuous form does not fit the sentence. (PRINTED-KEY ERROR CORRECTED: the reproduction's printed key (grid + detailed key agree) says B, "are". That is wrong: a period of time, an amount of money, or a distance takes a singular verb, so the answer is A, "Is". Corrected by the assistant under the owner's 8 Nov 2026 delegation.)

Question 105 English

Choose the correct passive voice. How did she defraud him of his savings?

- A. How had he been defrauded of his savings?
- B. How had he been defrauded by her?
- C. How was he defrauded of his savings?
- D. How was he defrauded by her of his savings? ✓ **Correct answer**

e active sentence is in the simple past ("did defraud"), so the passive must be simple past ("was"), not past perfect ("had been").

B. Wrong: the past perfect tense is wrong, and the phrase "of his savings" is dropped.

C. Also a correct passive: it keeps the simple past tense and the phrase "of his savings", dropping only the agent "by her", which is optional in a passive sentence.

D. Correct per the printed key: it keeps the simple past tense, the agent "by her", and the phrase "of his savings". (PICK-ONE: options C and D are both grammatical passives of the active sentence; the key records D. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

Question 106 English

Identify the error and choose the correct option: The rehearsal session started and we have little time to spare for other activities.

- A. The rehearsal session started and we have little time to spare for other activities. ✓ **Correct answer**
- B. The rehearsal session started, and we little time to spare for other activities.
- C. The rehearsal session starts and we has little time to spare for other activities.
- D. We are little time to spare for other activities, the rehearsals session starts.

A. Correct: the original sentence is already correct, so the correct option is the sentence itself, unchanged.

B. Wrong: it drops the verb "have" from the second clause.

C. Wrong: "we has" is wrong (it should be "we have"), and the tense change is unneeded.

D. Wrong: it is garbled and ungrammatical.

107 English

Fill in the blank with appropriate option: Lions, like any other carnivore, ____ on meat.

- A. Live ✓ **Correct answer**
- B. Lives
- C. Does live
- D. Living

A. Correct: the subject is "Lions" (plural), so the verb is plural "live"; the phrase "like any other carnivore" is parenthetical and does not change the subject.

B. Wrong: "lives" is singular and does not agree with the plural subject "Lions".

C. Wrong: the emphatic "does live" is singular and does not fit the plural subject.

D. Wrong: "living" is a participle, not a finite verb for this sentence.

Question 108 English

Fill in the blank with appropriate option: The cattle ____ away the crops.

- A. Has eaten
- B. Is eating
- C. Have eaten ✓ **Correct answer**
- D. Have been eating

A. Wrong: "cattle" is a plural noun, so it takes a plural verb, not "has".

B. Wrong: "is" is singular and does not agree with "cattle".

C. Correct: "cattle" is plural, so the plural perfect "have eaten" is correct.

D. Wrong: the perfect continuous is not the keyed form here; the simple perfect "have eaten" is the expected answer.

109 English

The word "LABYRINTH" means:

- A. Maze ✓ **Correct answer**
- B. Heap
- C. Hive
- D. Knack

A. Correct: a labyrinth is a maze — a network of winding paths.

B. Wrong: a heap is a pile of things.

C. Wrong: a hive is a bees' home.

D. Wrong: a knack is a skill or talent.

Question 110 English

Pick the correct option: These are old those are new.

- A. These, are old, those are new.
- B. These are old; those are new. ✓ **Correct answer**
- C. These are old: those are new.
- D. These are old — those are new.

A. Wrong: the commas are misplaced and do not separate the two clauses correctly.

B. Correct: a semicolon separates the two independent clauses.

C. Wrong: a colon is used to introduce an explanation or list, not to join two contrasting clauses of this kind.

D. Wrong: a dash is not the standard punctuation for joining these two clauses.

111 English

Ahmad carried out his duty according _____ instructions.

- A. Too
- B. To ✓ **Correct answer**
- C. Under
- D. An

A. Wrong: "too" means "also" or "excessively", not the preposition needed here.

B. Correct: the idiom is "according to instructions".

C. Wrong: "according under" is not an English idiom.

D. Wrong: "an" is an article, not the preposition needed here.

Question 112 English

Identify the error and choose the correct option: The first space travellr was dennis tito from united states.

- A. The first space traveler was Dennis Tito from the United States. ✓ **Correct answer**
- B. The First Space Traveler was Dennis Tito, from, the United States.
- C. The first space traveler was Dennis Tito-from the United States.
- D. The first space traveler was Dennis Tito, from the United States.

A. Correct: it fixes the spelling ("travellr" → "traveler") and capitalises the proper names ("Dennis Tito", "United States").

B. Wrong: the capital letters and the commas are misplaced.

C. Wrong: the hyphen is wrong and the sentence is malformed.

D. Wrong: the comma before "from" is unnecessary; option A is the clean correction.

113 English

Select the right sentence.

- A. He opened the square red wooden box.
- B. He opened the red square wooden box. ✓ **Correct answer**
- C. He opened the wooden red square box.
- D. He opened the red wooden square box.

A. Wrong: the adjective order is wrong — colour comes before shape.

B. Correct: the adjective order is colour (red), shape (square), material (wooden).

C. Wrong: the material must come last, after colour and shape.

D. Wrong: the shape must come before the material.

Question 114 English

Fill in the blank. I can't walk _____.

- A. Farther ✓ **Correct answer**
- B. Far
- C. Further
- D. Away

A. Correct: "farther" is used for physical distance, and walking is a physical distance.

B. Wrong: "far" alone does not complete the sentence ("I can't walk far" is possible, but the keyed comparative is "farther").

C. Wrong: "further" is used for figurative or additional distance, not physical distance.

D. Wrong: "I can't walk away" changes the meaning of the sentence.

115 English

Can you tell this fact ____ his face?

- A. To ✓ **Correct answer**
- B. On
- C. Upon
- D. At

A. Correct: the idiom is "to his face" (saying something directly to someone).

B. Wrong: "on his face" means physically on the face, not the idiom.

C. Wrong: "upon his face" is not the idiom.

D. Wrong: "at his face" is not the idiom.

Question 116 English

Choose the correct option.

- A. The Three Musketeers was written by Dumas. ✓ **Correct answer**
- B. The Three Musketeers were written by Dumas.
- C. The Three Musketeers has written by Dumas.
- D. The Three Musketeers have written by Dumas.

A. Correct: a book title is treated as singular, so the singular verb "was" is correct.

B. Wrong: the plural verb does not agree with the singular book title.

C. Wrong: the active voice "has written" is wrong, and the verb is singular in the wrong construction.

D. Wrong: the active voice is wrong and the verb is plural.

117 English

They have painted their house purple. The sentence is an example of:

- A. Monotransitive
- B. Ditransitive
- C. Complex transitive ✓ **Correct answer**
- D. Reflexive transitive

A. Wrong: a monotransitive verb takes only one object, but "painted" here takes an object ("their house") plus a complement ("purple").

B. Wrong: a ditransitive verb takes two objects (direct and indirect), not an object plus a complement.

C. Correct: "painted" takes an object and an object complement ("purple" describes the house), which is a complex transitive construction.

D. Wrong: a reflexive construction involves the subject acting on itself, which is not the case here.

Question 118 English

Select the correct option: He was killed _____ robber _____ a hatchet.

- A. From, with
- B. By, at
- C. Through, far
- D. By, with ✓ **Correct answer**

A. Wrong: "killed from robber" is not correct English.

B. Wrong: "with a hatchet" needs "with", not "at".

C. Wrong: neither preposition fits the sentence.

D. Correct: "He was killed by [a] robber with a hatchet" — "by" gives the agent and "with"

Question 119 English

Choose the correct option:

- A. "Well no, perhaps not sir"
- B. "Well, no, perhaps not sir". ✓ **Correct answer**
- C. "Well, no perhaps not sir"
- D. "Well no perhaps, not sir"

A. Wrong: the introductory "Well" and the reply "no" both need commas after them.

B. Correct: commas follow "Well" and "no", and the full stop closes the quoted sentence.

C. Wrong: the comma after "no" is missing.

D. Wrong: the commas are in the wrong places.

Question 120 English

Find out antonym of "Mumbled".

- A. Unprovoked
- B. Quiver
- C. Loud ✓ **Correct answer**
- D. Rarely

A. Wrong: "unprovoked" means not caused by anything, which is unrelated to mumbling.

B. Wrong: "quiver" means to tremble, which is unrelated to mumbling.

C. Correct: "mumbled" means spoken quietly and indistinctly, so its opposite is "loud".

D. Wrong: "rarely" means infrequently, which is unrelated to mumbling.

121 Biology

Negative feedback mechanism is the characteristic of which class?

- A. Class fish
- B. Class amphibia
- C. Class reptelia
- D. Class Mammalia ✓ **Correct answer**

A. Wrong: fish regulate their internal environment, but the most developed negative-feedback homeostasis in the FSc framing is that of mammals.

B. Wrong: amphibia regulate internally, but the paper's keyed class for the negative feedback mechanism is Mammalia.

C. Wrong: reptilia regulate internally, but the paper's keyed class is Mammalia, whose warm-blooded homeostasis depends most on negative feedback.

D. Correct per the printed key: the negative feedback mechanism (homeostasis) is the characteristic regulatory mechanism of mammals.

Question 122 Biology

The function of papillary is to:

- A. Move blood from semilunar valve into pulmonary vein.
- B. Prevent the backward flow of blood from the ventricle. ✓ **Correct answer**
- C. Push the blood from right atrium to left atrium
- D. Push the blood from left atrium to aorta

A. Wrong: papillary muscles do not move blood into the pulmonary vein.

B. Correct: the papillary muscles hold the atrioventricular valves shut during ventricular contraction, preventing blood from flowing back into the atria.

C. Wrong: blood does not flow from the right atrium to the left atrium, and papillary

D. Wrong: blood flows from the left atrium to the left ventricle and then to the aorta; papillary muscles do not push it.

Question 123 Biology

Choose the correct pathway for the flow of blood.

- A. Arterioles — metarterioles — thoroughfare channel — capillaries ✓ **Correct answer**
- B. Arterioles — thoroughfare channel — metarterioles — capillaries
- C. Thoroughfare channel — arterioles — capillaries — metarterioles
- D. Metarterioles — arterioles — thoroughfare channel — capillaries

A. Correct: in the microcirculation, blood flows from arterioles into metarterioles, then through thoroughfare channels into capillaries.

B. Wrong: the thoroughfare channel comes after the metarteriole, not before it.

C. Wrong: the sequence is reversed and scrambled.

D. Wrong: arterioles come before metarterioles, not after them.

Question 124 Biology

Intrinsic factor is secreted by:

- A. Pancreas
- B. Liver
- C. Stomach ✓ **Correct answer**
- D. Duodenum

A. Wrong: the pancreas secretes digestive enzymes and bicarbonate, not intrinsic factor.

B. Wrong: the liver secretes bile, not intrinsic factor.

intrinsic factor is secreted by the parietal cells of the stomach and is needed for vitamin B12 absorption.

D. Wrong: the duodenum secretes hormones such as secretin, not intrinsic factor.

Question 125 Biology

Gaseous exchange in plants takes place through the:

- A. Stomata ✓ **Correct answer**
- B. Mesophyll
- C. Endoderm
- D. Xylem

A. Correct: gaseous exchange in plants takes place mainly through the stomata (the pores in the leaves).

B. Wrong: the mesophyll is the tissue where photosynthesis happens, not the opening through which gases enter and leave.

C. Wrong: the endodermis is a layer in roots, not the site of gaseous exchange.

D. Wrong: xylem transports water, not gases.

Question 126 Biology

Translocation of organic solutes in plants takes place through:

- A. Companion cell
- B. Fibers
- C. Sieve tubes ✓ **Correct answer**
- D. Vessels

A. Wrong: companion cells support the sieve tubes but do not themselves carry the solutes over long distances.

…ores give mechanical support, they do not translocate organic solutes.

C. Correct: organic solutes (food) are translocated through the sieve tubes of the phloem.

D. Wrong: vessels are xylem elements that carry water and minerals, not organic solutes.

Question 127 Biology

The only vein in the human body carrying oxygenated blood is:

- A. Femoral
- B. Pulmonary ✓ **Correct answer**
- C. Renal
- D. Iliac

A. Wrong: the femoral vein carries deoxygenated blood from the leg.

B. Correct: the pulmonary veins carry oxygenated blood from the lungs to the left atrium — the only veins that carry oxygenated blood.

C. Wrong: the renal vein carries deoxygenated blood from the kidney.

D. Wrong: the iliac vein carries deoxygenated blood from the lower body.

Question 128 Biology

The cells which play very important role developing immunity are:

- A. Monocytes
- B. Neutrophils
- C. Lymphocytes ✓ **Correct answer**
- D. Thrombocytes

A. Wrong: monocytes become macrophages and help immunity, but the key cells of specific immunity are lymphocytes.

B. Wrong: neutrophils are phagocytes of innate immunity, not the cells of specific

immunity.

C. Correct: lymphocytes (B cells and T cells) are the cells that develop specific immunity.

D. Wrong: thrombocytes (platelets) are for blood clotting, not immunity.

Question 129 Biology

Which of the following blood vessels have the highest pressure of blood?

- A. Aorta ✓ **Correct answer**
- B. Pulmonary arteries
- C. Pulmonary veins
- D. Vena Cava

A. Correct: the aorta receives blood directly from the left ventricle at the highest pressure in the circulation.

B. Wrong: pulmonary arteries carry blood at a much lower pressure than the aorta.

C. Wrong: pulmonary veins are low-pressure vessels returning blood to the heart.

D. Wrong: the vena cava is a low-pressure vessel returning blood to the right atrium.

Question 130 Biology

Autoimmune diseases act at the principle of:

- A. Self against antigens
- B. Antigens against self
- C. Self against self ✓ **Correct answer**
- D. Antigen self-destroyed

A. Wrong: "self against antigens" describes a normal immune response to foreign antigens, not autoimmunity.

B. Wrong: antigens do not attack the self; the immune system attacks the self.

autoimmune disease the body's own immune system attacks its own tissues — self against self.

D. Wrong: that is not a description of autoimmunity.

Question 131 Biology

Urine leaves the kidney through a duct called:

- A. Urethra
- B. Pelvis
- C. Ureter ✓ **Correct answer**
- D. Nephron

A. Wrong: the urethra carries urine from the bladder out of the body, not from the kidney.

B. Wrong: the renal pelvis collects urine inside the kidney, but the duct that leaves the kidney is the ureter.

C. Correct: urine leaves the kidney through the ureter to the bladder.

D. Wrong: the nephron is the functional unit that forms urine inside the kidney, not the duct that carries it out.

Question 132 Biology

Digestion of which food components starts from oral cavity?

- A. Proteins
- B. Fats
- C. Carbohydrates ✓ **Correct answer**
- D. Vitamins

A. Wrong: protein digestion begins in the stomach with pepsin.

B. Wrong: fat digestion begins in the small intestine with bile and lipase.

arbohydrate digestion begins in the mouth, where salivary amylase starts breaking down starch.

D. Wrong: vitamins are not digested; they are absorbed as they are.

Question 133 Biology

In human gut, chylomicrons are formed by the combination of:

- A. Fats and proteins ✓ **Correct answer**
- B. Fats and carbohydrates
- C. Vitamins and fats
- D. Proteins and carbohydrates

A. Correct: chylomicrons are fat droplets (triglycerides, phospholipids, cholesterol) coated with protein (apolipoproteins) — a combination of fats and proteins.

B. The printed key: wrong. Carbohydrates are not a component of chylomicrons.

C. Wrong: vitamins are not a structural component of chylomicrons.

D. Wrong: chylomicrons are formed from fats and proteins, not from proteins and carbohydrates. (Option D is rendered as a stray "a) Proteins and carbohydrates" in the extraction; it is transcribed here as the fourth option.) (PRINTED-KEY ERROR CORRECTED: the reproduction's printed key (grid + detailed key agree) says B, "Fats and carbohydrates". That is wrong: chylomicrons are lipoprotein particles — triglycerides, phospholipids and cholesterol wrapped in apolipoproteins — and contain no carbohydrate. The answer is A, "Fats and proteins". Corrected by the assistant under the owner's 8 Nov 2026 delegation.)

Question 134 Biology

Dark reaction of photosynthesis takes place in _____ of chloroplast.

- A. Thylakoids

- C. Intergrana
- D. Stomata

No answer is given for this question, and none is taught. NO CORRECT OPTION — DEFECTIVE-excluded (decided by assistant under owner's 8 Nov 2026 delegation)

A. Wrong: the light reaction takes place in the thylakoids, not the dark reaction.

B. Wrong: the grana are stacks of thylakoids where the light reaction takes place.

C. Wrong: the intergrana are the spaces between grana, not the site of the dark reaction.

D. The printed key: wrong. Stomata are pores on the leaf surface, not parts of the chloroplast at all. (DEFECTIVE-excluded: the dark reaction (Calvin cycle) takes place in the stroma of the chloroplast, which is not among the options, so no option is correct. The printed key D is recorded here for the record. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

Question 135 Biology

Which of the following occurs in the body in response to the secretion of glucagon?

- A. Conversion of glucose to glycogen in liver cells
- B. Decrease in blood glucose concentration
- C. Increased uptake of glucose by muscle cells
- D. Production of cyclic AMP in target cells ✓ **Correct answer**

A. Wrong: that is the effect of insulin, not glucagon.

B. Wrong: glucagon raises blood glucose, it does not lower it.

C. Wrong: glucagon does not increase glucose uptake by muscle cells; insulin does.

D. Correct: glucagon acts through a second messenger, cyclic AMP, in its target cells (mainly liver cells).

136 Biology

Almost all of the fresh water animals and most of the marine vertebrates are:

- A. Osmoconformers
- B. Osmoregulators ✓ **Correct answer**
- C. Isotonic to environment
- D. At dynamic equilibrium to environment

A. Wrong: osmoconformers (mostly marine invertebrates) match their internal salt concentration to the environment; freshwater animals do the opposite.

B. Correct: freshwater animals and most marine vertebrates actively regulate their internal salt and water balance.

C. Wrong: freshwater animals are hypertonic to their environment, not isotonic.

D. Wrong: that is too vague; the specific term is osmoregulators.

Question 137 Biology

In marine environment, the ion secreted by kidney is:

- A. Na^{+}
- B. K^{+}
- C. Mg^{++} ✓ **Correct answer**
- D. Cl^{-}

A. Wrong: marine fish excrete excess sodium mainly through their gills, not the kidney.

B. Wrong: potassium is not the ion the marine fish kidney characteristically secretes.

C. Correct: marine teleosts drink seawater and excrete the excess magnesium (and sulphate) ions through the kidney.

D. Wrong: chloride is excreted mainly through the gills, not the kidney.

138 Biology

Which organ is called the body thermostat?

- A. Pituitary gland
- B. Kidneys
- C. Hypothalamus ✓ **Correct answer**
- D. Adrenal gland

A. Wrong: the pituitary is the master endocrine gland, not the thermostat.

B. Wrong: the kidneys regulate water and salts, not body temperature.

C. Correct: the hypothalamus monitors and regulates body temperature, so it is called the body thermostat.

D. Wrong: the adrenal glands secrete adrenaline and steroids, they do not set body temperature.

Question 139 Biology

The uptake of sodium in the ascending limb of loop of Henle is controlled by:

- A. Aldosterone ✓ **Correct answer**
- B. ADH
- C. Glucosterone
- D. Thyroxin

A. Correct per the printed key: aldosterone controls sodium reabsorption in the kidney tubules, including the ascending limb of the loop of Henle.

B. Wrong: ADH (vasopressin) controls water reabsorption, not sodium uptake.

C. Wrong: there is no hormone called "glucosterone" that controls sodium uptake (the word is a garble of glucocorticoid).

D. Wrong: thyroxin controls metabolic rate, not sodium uptake in the kidney.

140 Biology

The multinucleated mass of the bone forming cells is called:

- A. Osteoclasts
- B. Osteoblasts ✓ **Correct answer**
- C. Osteogenics
- D. Osteocytes

A. Also correct on one reading: osteoclasts are the multinucleated bone cells — "multinucleated" points to them.

B. Correct per the printed key: osteoblasts are the bone-forming cells — "bone forming" points to them.

C. Wrong: osteogenic (osteoprogenitor) cells are stem cells that give rise to osteoblasts; they are not the multinucleated bone-forming mass.

D. Wrong: osteocytes are mature bone cells trapped in the matrix; they are not multinucleated and do not form bone. (PICK-ONE: the stem combines two descriptions that point to different cells — "multinucleated" (osteoclasts, A) and "bone forming" (osteoblasts, B); the key records B. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

Question 141 Biology

Chief material present in the cell wall of plants, fungal and prokaryotic cells are:

- A. Proteins
- B. Lipids
- C. Polysaccharides ✓ **Correct answer**
- D. Phospholipids

A. Wrong: proteins are present in cell walls but are not the chief material.

B. Wrong: lipids are not the chief material of cell walls.

lant walls are cellulose, fungal walls are chitin, and bacterial walls are peptidoglycan — all polysaccharides.

D. Wrong: phospholipids are the chief material of cell membranes, not cell walls.

Question 142 Biology

Which type of leucoplasts store lipids?

- A. Amyloplast
- B. Elaioplast ✓ **Correct answer**
- C. Proteinoplast
- D. Etioplast

A. Wrong: amyloplasts store starch.

B. Correct: elaioplasts (oleoplasts) store lipids (oils).

C. Wrong: proteinoplasts store proteins.

D. Wrong: etioplasts are plastids of plants grown in the dark; they do not store lipids.

Question 143 Biology

Which type of movement through cell membrane is not energy consuming process?

- A. Endocytosis
- B. Exocytosis
- C. Active transport
- D. Osmosis ✓ **Correct answer**

A. Wrong: endocytosis needs energy (ATP) to bring material into the cell.

B. Wrong: exocytosis needs energy (ATP) to expel material from the cell.

C. Wrong: active transport needs energy to move substances against their gradient.

smosis is the passive movement of water down its concentration gradient and needs no energy.

Question 144 Biology

Cholesterol molecules in plasma membrane are present in _____:

- A. Outer membrane of phospholipid
- B. Inner membrane of phospholipid
- C. Both layers of phospholipid ✓ **Correct answer**
- D. Between bilayers of phospholipid

A. Wrong: cholesterol is not confined to the outer leaflet.

B. The printed key: wrong. Cholesterol is not confined to the inner leaflet; it is present in both leaflets.

C. Correct: cholesterol molecules are interspersed among the lipids in both layers (leaflets) of the phospholipid bilayer.

D. Wrong: there is only one bilayer; cholesterol sits within it, between the fatty acid tails of both leaflets, not "between bilayers". (PRINTED-KEY ERROR CORRECTED: the reproduction's printed key (grid + detailed key agree) says B, "Inner membrane of phospholipid". That is wrong: cholesterol is interspersed among the lipids in both leaflets of the bilayer, not confined to the inner one. The answer is C, "Both layers of phospholipid". Corrected by the assistant under the owner's 8 Nov 2026 delegation.)

Question 145 Biology

Fibers of extracellular matrix are attached to ____ in plasma membrane.

- A. Phospholipids
- B. Carbohydrates
- C. Glycolipids
- D. Proteins ✓ **Correct answer**

extracellular matrix fibres do not attach to the phospholipids themselves.

B. Wrong: carbohydrates on the membrane surface do not anchor the matrix fibres.

C. Wrong: glycolipids do not anchor the extracellular matrix fibres.

D. Correct: the fibres of the extracellular matrix attach to integral membrane proteins (integrins) in the plasma membrane.

Question 146 Biology

_____ organelles involve in the synthesis of plant cell wall.

- A. Endoplasmic reticulum
- B. Golgi complex ✓ **Correct answer**
- C. Lysosomes
- D. Peroxisomes

A. Wrong: the endoplasmic reticulum makes proteins and lipids, but the wall polysaccharides are packaged by the Golgi complex.

B. Correct: the Golgi complex produces and secretes the pectins and hemicelluloses of the plant cell wall.

C. Wrong: lysosomes digest material inside the cell; they do not synthesise the wall.

D. Wrong: peroxisomes carry out oxidative reactions; they do not synthesise the wall.

Question 147 Biology

Select the pair of organs which contain a large number of mitochondria.

- A. Stomach and liver
- B. Muscle and stomach
- C. Heart and liver
- D. Liver and muscle ✓ **Correct answer**

e stomach is not among the organs richest in mitochondria.

B. Wrong: the stomach is not among the organs richest in mitochondria.

C. Wrong as the keyed answer: heart and liver are both very rich in mitochondria, but the printed key records the pair liver and muscle.

D. Correct per the printed key: liver and muscle both contain large numbers of mitochondria. (Note: heart and liver (C) are also mitochondria-rich; the stem asks for "a large number", not "the largest number", and the keyed pair D is followed.)

Question 148 Biology

Which of the following cells does not have nucleus?

- A. Muscle cell
- B. Nerve cell
- C. White blood cell
- D. Red blood cell ✓ **Correct answer**

A. Wrong: muscle cells have nuclei.

B. Wrong: nerve cells have a nucleus.

C. Wrong: white blood cells have a nucleus.

D. Correct: mature mammalian red blood cells have no nucleus.

Question 149 Biology

Most abundant organic compounds in mammalian cell are:

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

ater is the most abundant compound overall, but it is inorganic, not organic.

B. Wrong: lipids are present but are not the most abundant organic compounds.

C. Wrong: carbohydrates are present in smaller amounts than proteins.

D. Correct: among organic compounds, proteins are the most abundant in a mammalian cell.

Question 150 Biology

Second most abundant bio element in human body is:

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

A. Wrong: oxygen is the most abundant bioelement (about 65%), not the second.

B. Correct: carbon is the second most abundant bioelement (about 18.5%), after oxygen.

C. Wrong: hydrogen is the third most abundant (about 9.5%).

D. Wrong: nitrogen is the fourth most abundant (about 3.2%).

Question 151 Biology

Lecithin is formed by combining phosphatidic acid with _____:

- A. Serine
- B. Choline ✓ **Correct answer**
- C. Inositol
- D. Ethanolamine

A. Wrong: phosphatidic acid plus serine gives phosphatidylserine, not lecithin.

ecithin is phosphatidylcholine — phosphatidic acid combined with choline.

C. Wrong: phosphatidic acid plus inositol gives phosphatidylinositol, not lecithin.

D. Wrong: phosphatidic acid plus ethanolamine gives phosphatidylethanolamine, not lecithin.

Question 152 Biology

NAD is an example of _____:

- A. Monosaccharide
- B. Dinucleotide ✓ **Correct answer**
- C. Tri nucleotide
- D. Tetra nucleotide

A. Wrong: NAD is not a sugar.

B. Correct: NAD (nicotinamide adenine dinucleotide) is made of two nucleotides joined together.

C. Wrong: NAD has two nucleotide units, not three.

D. Wrong: NAD has two nucleotide units, not four.

Question 153 Biology

What would be the number of nucleotides for a protein molecule about 142 amino acids?

- A. 430
- B. 142
- C. 426 ✓ **Correct answer**
- D. 460

A. Wrong: 430 is not three times 142.

B. Wrong: 142 is the number of amino acids, not nucleotides.

each amino acid is coded by three nucleotides, so 142 × 3 = 426 nucleotides.

D. Wrong: no combination of 142 and 3 gives 460.

Question 154 Biology

The basic structural framework of all types of membrane are:

- A. Glycolipids
- B. Glycoproteins
- C. Lipoproteins ✓ **Correct answer**
- D. Nucleoproteins

A. Wrong: glycolipids are minor membrane components, not the basic framework.

B. Wrong: glycoproteins are minor membrane components, not the basic framework.

C. Correct: membranes are basically lipoprotein in nature — a lipid bilayer with proteins.

D. Wrong: nucleoproteins are found in the nucleus, not as the framework of membranes.

Question 155 Biology

Non protein but inorganic detachable cofactor is called _____:

- A. Activator ✓ **Correct answer**
- B. Prosthetic group
- C. Co-enzyme
- D. Apo-enzyme

A. Correct: an activator is an inorganic ion (such as Mg^{2+} or Zn^{2+}) that attaches loosely to an enzyme and activates it.

B. Wrong: a prosthetic group is an organic cofactor firmly attached to the enzyme.

C. Wrong: a co-enzyme is an organic, non-protein cofactor, not an inorganic one.

e apo-enzyme is the protein part of the enzyme without its cofactor.

Question 156 Biology

When inhibitor binds to enzyme other than active site and alters its structure, then it is called:

- A. Competitive inhibitor
- B. Non-competitive inhibitor ✓ **Correct answer**
- C. Reversible inhibitor
- D. Irreversible inhibitor

A. Wrong: a competitive inhibitor binds at the active site, competing with the substrate.

B. Correct: a non-competitive inhibitor binds at a site other than the active site (the allosteric site) and changes the enzyme's shape.

C. Wrong: "reversible" describes whether the inhibition can be undone, not where the inhibitor binds.

D. Wrong: an irreversible inhibitor binds permanently, which is a different distinction from the binding site.

Question 157 Biology

Cyanides are potent poisons of living organism and can kill by inhibiting _____ essential for cellular respiration.

- A. Cytochromes oxidases ✓ **Correct answer**
- B. Dehydrogenases
- C. Hydrolases
- D. Nucleases

A. Correct: cyanide blocks cytochrome c oxidase (complex IV) of the electron transport chain, stopping cellular respiration.

anide does not act by inhibiting dehydrogenases.

C. Wrong: hydrolases split bonds with water; cyanide does not inhibit them.

D. Wrong: nucleases cut nucleic acids; cyanide does not inhibit them.

Question 158 Biology

During feedback inhibition, which of the following structural part of enzyme is involved?

- A. Active site
- B. Binding site
- C. Catalytic site
- D. Allosteric site ✓ **Correct answer**

A. Wrong: in feedback inhibition the end product binds away from the active site.

B. Wrong: "binding site" is too vague; the specific site is the allosteric site.

C. Wrong: the catalytic site is where the reaction happens, not where the inhibitor binds.

D. Correct: in feedback inhibition the end product binds to the allosteric site and changes the enzyme's shape.

Question 159 Biology

Which of the following enzyme does not need a Co-factor?

- A. Hexokinase
- B. Pepsin ✓ **Correct answer**
- C. Alcohol dehydrogenase
- D. Carbonic anhydrase

A. Wrong: hexokinase needs Mg^{2+} as a cofactor.

B. Correct: pepsin works without a cofactor.

...cohol dehydrogenase needs Zn^{2+} and NAD^{+} as cofactors.

D. Wrong: carbonic anhydrase needs Zn^{2+} as a cofactor.

Question 160 Biology

If another molecule, having a shape very similar to the enzyme's substrate, binds to its active site, it would then _____ the enzyme's function.

- A. Fasten
- B. Inhibit ✓ **Correct answer**
- C. Reverse
- D. Decrease

A. Wrong: "fasten" is not the term for what a substrate analogue does to an enzyme.

B. Correct: a molecule that resembles the substrate and occupies the active site blocks the real substrate — competitive inhibition.

C. Wrong: the analogue does not reverse the enzyme's function; it blocks it.

D. Wrong as the keyed answer: although the rate decreases, the textbook term for the effect is "inhibit", which is the keyed option.

Question 161 Biology

Myofibrils within the muscle fibers contain thick and thin filaments made up of _____ and ____ respectively.

- A. Myosin and actin ✓ **Correct answer**
- B. Globulin and albumin
- C. Troponin and tropomyosin
- D. Fibrin and fibrinogen

A. Correct: the thick filaments are myosin and the thin filaments are actin.

obulin and albumin are blood plasma proteins, not muscle filaments.

C. Wrong: troponin and tropomyosin are regulatory proteins on the thin filament, not the filaments themselves.

D. Wrong: fibrin and fibrinogen are blood-clotting proteins, not muscle filaments.

Question 162 Biology

Vertebrae of the neck are called:

- A. Coccygeal vertebrae
- B. Cervical vertebrae ✓ **Correct answer**
- C. Sacral vertebrae
- D. Lumbar vertebrae

A. Wrong: coccygeal vertebrae form the tailbone.

B. Correct: the seven vertebrae of the neck are the cervical vertebrae.

C. Wrong: sacral vertebrae are fused into the sacrum at the back of the pelvis.

D. Wrong: lumbar vertebrae are the vertebrae of the lower back.

Question 163 Biology

Which vertebrae together are called pelvic vertebrae?

- A. Coccygeal and lumber
- B. Sacral and lumber
- C. Sacral and coccygeal ✓ **Correct answer**
- D. Sacral and thoracic

A. Wrong: the lumbar vertebrae are not part of the pelvis.

B. Wrong: the lumbar vertebrae are not part of the pelvis.

…e sacral and coccygeal vertebrae together are the pelvic vertebrae.

D. Wrong: the thoracic vertebrae are in the chest, not the pelvis.

Question 164 Biology

The correct option about spinal nerve is:

- A. 33 pairs
- B. Mostly mixed nerves ✓ **Correct answer**
- C. Dorsal root contains sensory neurons
- D. Ventral root contains motor neurons

A. Wrong: there are 31 pairs of spinal nerves, not 33.

B. Correct per the printed key: spinal nerves are mostly mixed nerves, carrying both sensory and motor fibres.

C. Also true: the dorsal root carries sensory neurons into the spinal cord.

D. Also true: the ventral root carries motor neurons out of the spinal cord. (PICK-ONE: options B, C and D are all true statements about spinal nerves; the key records B. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

Question 165 Biology

_____ is sometimes given by injection as an emergency treatment in cardiac arrest.

- A. Acetylcholine
- B. Dopamine
- C. Serotonin
- D. Epinephrine ✓ **Correct answer**

A. Wrong: acetylcholine slows the heart; it is not given in cardiac arrest.

B. Wrong: dopamine is used for low blood pressure and shock, not as the standard

drug in cardiac arrest.

C. Wrong: serotonin is not given in cardiac arrest.

D. Correct: adrenaline (epinephrine) is given by injection in cardiac arrest to restart the heart.

Question 166 Biology

Which of the following is neurotransmitter?

- A. Dopamine ✓ **Correct answer**
- B. Hydrochloric acid
- C. Sodium ions
- D. Calcium ions

A. Correct: dopamine is a neurotransmitter.

B. Wrong: hydrochloric acid is stomach acid, not a neurotransmitter.

C. Wrong: sodium ions carry nerve impulses but are not neurotransmitters.

D. Wrong: calcium ions trigger neurotransmitter release but are not neurotransmitters themselves.

Question 167 Biology

Which hormone is chemically a steroid?

- A. ADH
- B. Thyroxin
- C. Cortisone ✓ **Correct answer**
- D. Insulin

A. Wrong: ADH (vasopressin) is a peptide hormone, not a steroid.

B. Wrong: thyroxin is an amino acid derivative, not a steroid.

ortisone is a corticosteroid hormone.

D. Wrong: insulin is a peptide (protein) hormone, not a steroid.

Question 168 Biology

Which hormone is secreted by variety of cells all over the body?

- A. Prostaglandin ✓ **Correct answer**
- B. Endorphin
- C. Secretin
- D. Erythropoietin

A. Correct: prostaglandins are local hormones secreted by a wide variety of cells all over the body.

B. Wrong: endorphins are secreted mainly by the brain and pituitary, not by cells all over the body.

C. Wrong: secretin is secreted by the duodenum only.

D. Wrong: erythropoietin is secreted by the kidney (and liver), not by cells all over the body.

Question 169 Biology

Which brain portion is responsible for controlling body coordination?

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

A. Wrong: the medulla controls involuntary actions such as breathing and heartbeat, not coordination.

e amygdala is involved in emotions, not body coordination.

C. Correct: the cerebellum coordinates body movements and maintains balance and posture.

D. Wrong: the pons relays signals between the brain parts; coordination is the cerebellum's job.

Question 170 Biology

The estrogen hormone secretion during the oogenesis is stimulated by:

- A. LH hormone
- B. Inhibition hormone
- C. FSH hormone ✓ **Correct answer**
- D. Testosterone hormone

A. Wrong: LH triggers ovulation and the formation of the corpus luteum; it is not the hormone that stimulates estrogen secretion during oogenesis.

B. Wrong: "inhibition hormone" is not the hormone that stimulates estrogen secretion.

C. Correct per the printed key: FSH stimulates the ovarian follicles, which secrete estrogen during oogenesis.

D. Wrong: testosterone is the male sex hormone and does not stimulate estrogen secretion in oogenesis.

Question 171 Biology

In human males, inhibition hormone is produced by:

- A. Leydig cells
- B. Hensen's node cells
- C. Sertoli cells ✓ **Correct answer**
- D. Interstitial cells

Leydig cells (interstitial cells) produce testosterone, not inhibin.

B. Wrong: Hensen's node is an embryonic structure, not a source of inhibin.

C. Correct: inhibin is produced by the Sertoli cells of the testes.

D. Wrong: interstitial (Leydig) cells produce testosterone, not inhibin.

Question 172 Biology

Which of the following is the largest phylum of kingdom Animalia?

- A. Chordata
- B. Mollusca
- C. Echinodermata
- D. Arthropoda ✓ **Correct answer**

A. Wrong: chordates are a large phylum but not the largest.

B. Wrong: molluscs are the second largest phylum, not the largest.

C. Wrong: echinoderms are a much smaller phylum.

D. Correct: Arthropoda is the largest phylum of the animal kingdom, with more species than any other phylum.

Question 173 Biology

The process of breakdown of glucose in the absence of oxygen is called:

- A. Aerobic respiration
- B. Anaerobic respiration ✓ **Correct answer**
- C. Oxidative phosphorylation
- D. Glycogenesis

A. Wrong: aerobic respiration is the breakdown of glucose in the presence of oxygen.

anaerobic respiration is the breakdown of glucose without oxygen.

C. Wrong: oxidative phosphorylation is the part of aerobic respiration that makes ATP using oxygen.

D. Wrong: glycogenesis is the formation of glycogen from glucose, not its breakdown.

Question 174 Biology

Which hormone stimulates the reabsorption of water in kidney tubules?

- A. Aldosterone
- B. ADH ✓ **Correct answer**
- C. Cortisol
- D. Renin

A. Wrong: aldosterone stimulates sodium reabsorption, not water reabsorption directly.

B. Correct: antidiuretic hormone (vasopressin) stimulates water reabsorption in the collecting ducts of the kidney.

C. Wrong: cortisol is a stress hormone, not the hormone for water reabsorption.

D. Wrong: renin is an enzyme that starts the aldosterone pathway; it does not itself stimulate water reabsorption.

Question 175 Biology

The number of chromosomes in a human sperm cell is:

- A. 46
- B. 23 ✓ **Correct answer**
- C. 92
- D. 44

A. Wrong: 46 is the number of chromosomes in a normal human body cell, not in a sperm.

human sperm is haploid and carries 23 chromosomes.

C. Wrong: 92 is twice the diploid number, not the sperm's count.

D. Wrong: 44 is the number of autosomes in a body cell, not the sperm's chromosome count.

Question 176 Biology

Which of the following is not a function of the liver?

- A. Production of bile
- B. Detoxification
- C. Production of insulin ✓ **Correct answer**
- D. Storage of glycogen

A. Wrong as an answer: the liver does produce bile.

B. Wrong as an answer: the liver does detoxify harmful substances.

C. Correct: insulin is produced by the beta cells of the pancreas, not by the liver.

D. Wrong as an answer: the liver does store glycogen.

Question 177 Biology

Plasmodium is transmitted through the bite of:

- A. Male Anopheles mosquito
- B. Female Anopheles mosquito ✓ **Correct answer**
- C. Male Culex mosquito
- D. Female Culex mosquito

A. Wrong: male mosquitoes do not bite humans; they feed on plant juices.

B. Correct: the female Anopheles mosquito transmits Plasmodium (malaria) when it bites to feed on blood.

ale Culex mosquitoes do not bite, and Culex does not transmit malaria.

D. Wrong: female Culex mosquitoes bite, but they transmit filariasis and other diseases, not malaria.

Question 178 Biology

Within the chromosomes, each chromatid contains ____ DNA molecule.

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

A. Correct: each chromatid is a single DNA molecule (with its proteins).

B. Wrong: a chromosome has two chromatids, but each chromatid has one DNA molecule.

C. Wrong: no chromatid contains three DNA molecules.

D. Wrong: a chromatid contains one whole DNA molecule, not half of one.

Question 179 Biology

Modification in the organization of the basic pentadactyl limb structure found in vertebrae provides good evidence for the principle of:

- A. Adaptive radiation ✓ **Correct answer**
- B. Convergent evaluation
- C. Genetic drift
- D. Inheritance of acquired character

A. Correct: the same five-digit limb plan modified for flying, swimming, running and grasping in different vertebrates is the classic evidence for adaptive radiation from a common ancestor.

nvergent evolution is the independent evolution of similar structures in unrelated groups, which is the opposite pattern.

C. Wrong: genetic drift is random change in gene frequencies, not the modification of a shared limb plan.

D. Wrong: the inheritance of acquired characters is Lamarck's discredited idea, not the explanation for the pentadactyl limb.

Question 180 Biology

Which of the following is a genetic disorder in which abnormally thick mucus is produced in the lungs and other parts of the body?

- A. Lung cancer
- B. Chronic bronchitis
- C. Cystic fibrosis ✓ **Correct answer**
- D. Emphysema

A. Wrong: lung cancer is uncontrolled cell growth, not a genetic disorder of thick mucus.

B. Wrong: chronic bronchitis is an inflammatory lung disease, not a genetic disorder of thick mucus.

C. Correct: cystic fibrosis is a recessive genetic disorder in which thick, sticky mucus is produced in the lungs and other organs.

D. Wrong: emphysema is the destruction of the air sacs of the lungs, not a genetic disorder of thick mucus.

Question 181 Biology

Oxygen released into the atmosphere comes from:

- A. CO_2
- B. H_2O ✓ **Correct answer**

- D. CO and H_2O

A. Wrong: the oxygen in carbon dioxide ends up in the glucose made by photosynthesis, not in the oxygen released.

B. Correct: the oxygen released in photosynthesis comes from the splitting (photolysis) of water.

C. Wrong: glucose is the product of photosynthesis, not the source of the released oxygen.

D. Wrong: carbon monoxide is not involved in photosynthesis.

Question 182 Biology

End product of glycolysis in yeast is:

- A. Ethanol and carbon dioxide
- B. Lactate
- C. Pyruvate ✓ **Correct answer**
- D. Acetyl Co. A

A. Wrong as the answer to this question: ethanol and carbon dioxide are the products of fermentation in yeast, which happens after glycolysis, not the end products of glycolysis itself.

B. Wrong: lactate is the end product of glycolysis in muscle cells under anaerobic conditions, not in yeast.

C. Correct: glycolysis ends with pyruvate; in yeast the pyruvate is then converted to ethanol and carbon dioxide by fermentation.

D. Wrong: acetyl CoA is formed from pyruvate when oxygen is present (in the link reaction), not as the end product of glycolysis.

183 Biology

First infectious disease against which effective method of prevention developed was a _____:

- A. Bacterial disease
- B. Viral disease ✓ **Correct answer**
- C. Protozoan disease
- D. Viroid disease

A. Wrong: the first disease prevented by vaccination was not a bacterial disease.

B. Correct: smallpox, a viral disease, was the first infectious disease against which an effective preventive method (Jenner's vaccination, 1796) was developed.

C. Wrong: no protozoan disease was the first to be prevented by vaccination.

D. Wrong: viroids cause plant diseases, and no viroid disease was the first to be prevented.

Question 184 Biology

_____ infection is caused by a viroid.

- A. Hepatitis A
- B. Hepatitis B
- C. Mad cow disease
- D. Mysterious brain infection

No answer is given for this question, and none is taught. NO CORRECT OPTION — DEFECTIVE-excluded (decided by assistant under owner's 8 Nov 2026 delegation)

A. Wrong: hepatitis A is caused by a virus (a picornavirus), not a viroid.

B. The printed key: wrong. Hepatitis B is caused by a DNA virus (hepatitis B virus), not a viroid.

ad cow disease (bovine spongiform encephalopathy) is caused by a prion, not a viroid.

D. Wrong: that is not a named disease, and no human brain infection is caused by a viroid. (DEFECTIVE-excluded: viroids cause plant diseases only — no human infection is caused by a viroid — so no offered option is correct. The printed key B is recorded here for the record. Decided by the assistant under the owner's 8 Nov 2026 delegation.)

Question 185 Biology

Numerous opportunistic diseases might attack a person suffering from which of the following disease?

- A. Measles
- B. Influenza
- C. Hepatitis A
- D. AIDS ✓ **Correct answer**

A. Wrong: measles weakens immunity briefly, but it is not the disease known for numerous opportunistic infections.

B. Wrong: influenza can lead to secondary infections, but it is not the disease known for numerous opportunistic diseases.

C. Wrong: hepatitis A is an acute liver infection, not a disease of opportunistic infections.

D. Correct: AIDS destroys the immune system, so numerous opportunistic diseases attack the sufferer.

Question 186 Biology

A combination of alpha interferon and ribavirin is used for the treatment of hepatitis:

- A. B
- B. A

Correct answer

- D. D

A. Wrong: hepatitis B is treated with other antivirals, not with the interferon–ribavirin combination.

B. Wrong: hepatitis A needs no antiviral treatment and is not treated with interferon and ribavirin.

C. Correct: the combination of alpha interferon and ribavirin is the classic treatment for hepatitis C.

D. Wrong: hepatitis D is treated differently and is not the disease for this combination. (The option letters in the reproduction are garbled — "A B, B A, C C" — but the keyed answer is hepatitis C, which is the standard treatment pairing.)

Question 187 Biology

Cysts are not resistant to _____ but spores are:

- A. Light
- B. Desiccation
- C. pH
- D. Heat ✓ **Correct answer**

A. Wrong: cysts are resistant to light, so light is not what they fail to resist.

B. Wrong: cysts are resistant to drying, so desiccation is not what they fail to resist.

C. Wrong: cysts tolerate a range of pH, so pH is not what they fail to resist.

D. Correct: cysts are killed by heat, while bacterial spores survive heat — so heat is what cysts are not resistant to.

188 Biology

In which phase of bacterial growth, they divide at exponential rate?

- A. Lag phase
- B. Log phase ✓ **Correct answer**
- C. Stationary phase
- D. Decline phase

A. Wrong: in the lag phase the bacteria adapt and do not divide.

B. Correct: in the log (exponential) phase the bacteria divide at an exponential rate.

C. Wrong: in the stationary phase the birth rate equals the death rate and there is no net growth.

D. Wrong: in the decline phase the bacteria die faster than they divide.

Question 189 Biology

Select a method which causes the oxidation of chemical constituent of a bacterial cell:

- A. Steam
- B. Dry heat ✓ **Correct answer**
- C. Filtration
- D. Radiation

A. Wrong: steam (moist heat) kills by coagulating proteins, not by oxidation.

B. Correct: dry heat sterilises by oxidising the chemical constituents of the bacterial cell.

C. Wrong: filtration removes bacteria physically; it does not oxidise their constituents.

D. Wrong: radiation kills by damaging DNA, not by oxidation of the cell's constituents.

190 Biology

How does chemosynthesis differ from photosynthesis?

- A. Source of energy ✓ **Correct answer**
- B. Production of organic compound
- C. Reduction of CO_2
- D. Carried out by bacteria

A. Correct: photosynthesis uses light energy, while chemosynthesis uses chemical energy from the oxidation of inorganic compounds — the energy source is the real difference.

B. Wrong: both processes produce organic compounds, so that does not distinguish them.

C. Wrong: both processes reduce carbon dioxide to make organic compounds, so that does not distinguish them.

D. The printed key: wrong. Chemosynthesis is carried out by bacteria, but photosynthesis is also carried out by bacteria (cyanobacteria and others), so that does not distinguish the two processes. (PRINTED-KEY ERROR CORRECTED: the reproduction's printed key (grid + detailed key agree) says D, "carried out by bacteria". That is wrong: photosynthesis is carried out by plants, algae and some bacteria, so being "carried out by bacteria" does not distinguish chemosynthesis from photosynthesis. The distinguishing feature is the source of energy (light versus chemical energy), so the answer is A. Corrected by the assistant under the owner's 8 Nov 2026 delegation.)

Question 191 Biology

Which one is different with respect to the modes of locomotion?

- A. Amoeba
- B. Paramecium ✓ **Correct answer**
- C. Foraminiferans
- D. Radiolarians

moeba moves by pseudopodia, like the foraminiferans and radiolarians.

B. Correct: Paramecium is the odd one out — it moves by cilia, while the others move by pseudopodia-like structures.

C. Wrong: foraminiferans move by pseudopodia (reticulopodia), like Amoeba and the radiolarians. (Option C is rendered "forms" in the extraction — a truncation, almost certainly of "Foraminiferans" — and the keyed answer is unaffected by it.)

D. Wrong: radiolarians move by pseudopodia (axopodia), like Amoeba and the foraminiferans.

Question 192 Biology

Aspergillosis is a fungal infection and occurs only in:

- A. Male
- B. Female
- C. AIDS patient ✓ **Correct answer**
- D. Athletes

A. Wrong: aspergillosis is not restricted to males.

B. Wrong: aspergillosis is not restricted to females.

C. Correct per the printed key: aspergillosis is an opportunistic fungal infection that occurs in immunocompromised people, such as AIDS patients.

D. Wrong: aspergillosis is not an infection of athletes.

Question 193 Biology

Select a sessile Zooflagellate.

- A. Trichonympha
- B. Trypanosoma

anoflagellate ✓ **Correct answer**

- D. Euglena

A. Wrong: Trichonympha is a flagellate of termite guts, not a sessile zooflagellate.

B. Wrong: Trypanosoma is a free-swimming parasitic flagellate, not sessile.

C. Correct: choanoflagellates are sessile (attached) zooflagellates.

D. Wrong: Euglena is a free-swimming flagellate, not sessile (and it is a phytoflagellate, not a zooflagellate).

Question 194 Biology

Many _____ expel large amount of water by special structures called contractile vacuoles.

- A. Protozoa ✓ **Correct answer**
- B. Porifera
- C. Echinoderm
- D. Fish

A. Correct: freshwater protozoa expel excess water through contractile vacuoles.

B. Wrong: sponges do not have contractile vacuoles.

C. Wrong: echinoderms do not expel water through contractile vacuoles.

D. Wrong: fish do not have contractile vacuoles.

Question 195 Biology

Chlorophyta are considered to be the closest to plants but do not resemble plants in having:

- A. Chlorophyll a and b
- B. Starch as stored food
- C. Cellulose cell wall

ticellular sex organs ✓ **Correct answer**

A. Wrong: green algae do have chlorophyll a and b, like plants.

B. Wrong: green algae do store starch, like plants.

C. Wrong: green algae do have cellulose cell walls, like plants.

D. Correct: green algae lack multicellular sex organs, which plants have — that is the feature in which they do not resemble plants.

Question 196 Biology

Asexual spores of fungi are called:

- A. Conidiospores ✓ **Correct answer**
- B. Zygospores
- C. Ascospores
- D. Basidiospores

A. Correct: the asexual spores of fungi are conidiospores (conidia).

B. Wrong: zygospores are sexual spores (resting spores) of some fungi.

C. Wrong: ascospores are sexual spores formed in asci.

D. Wrong: basidiospores are sexual spores formed on basidia.

Question 197 Biology

Which characteristic led to the evolution of seed?

- A. Heterogamous condition
- B. Development of heterospory ✓ **Correct answer**
- C. Embryo formation
- D. Protection of reproductive cells

heterogamy (different-sized gametes) is a step toward sexual reproduction, not the characteristic that led to the seed.

B. Correct: heterospory — the production of two kinds of spores (microspores and megaspores) — led to the evolution of the seed.

C. Wrong: embryo formation happens in all land plants, not only in seed plants.

D. Wrong: protection of reproductive cells is a consequence of the seed, not the characteristic that led to it.

Question 198 Biology

The term which is not related to the process of evolution of leaf:

- A. Overtopping
- B. Planation
- C. Heterospory ✓ **Correct answer**
- D. Fusion/webbing

A. Wrong as an answer: overtopping is one of the steps in the evolution of the leaf.

B. Wrong as an answer: planation is one of the steps in the evolution of the leaf.

C. Correct: heterospory is related to the evolution of the seed, not to the evolution of the leaf.

D. Wrong as an answer: fusion (webbing) is one of the steps in the evolution of the leaf.

Question 199 Biology

The most successful land adapting plants are:

- A. Mosses
- B. Ferns
- C. Gymnosperms

giosperms ✓ **Correct answer**

A. Wrong: mosses are the least adapted to land among the four (they need water for reproduction).

B. Wrong: ferns are better adapted than mosses but still need water for fertilisation.

C. Wrong: gymnosperms are well adapted to land, but angiosperms are the most successful.

D. Correct: angiosperms (flowering plants) are the most successful land plants.

Question 200 Biology

Excretory system consisting of protonephridial tubes are present in phylum:

- A. Porifera
- B. Annelida
- C. Platyhelminthes ✓ **Correct answer**
- D. Cnidaria

A. Wrong: sponges have no excretory system at all.

B. Wrong: annelids have metanephridia, not protonephridia.

C. Correct: flatworms have protonephridia (flame cells) as their excretory system.

D. Wrong: cnidarians have no excretory system of protonephridial tubes.

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ee the source note on this page about the fold-in corrections.