Male Subject Specialist Chemistry (B-17) — 2018 · Solved Past Paper

Body: Khyber Pakhtunkhwa Public Service Commission (KPPSC) · **Post:** Male Subject Specialist Chemistry (B-17) · **Year:** 2018 · **Questions:** 100 in the original paper — **98 solved and verified**, 2 excluded as defective (Q27, Q82) · **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 2018 sitting.

Source note: Scanned images of the printed KPPSC question paper, 4 question pages (Q1-Q100, complete), via doc4shares PDF "KPPSC SS Chemistry BS-17 Past Paper held in 2018" (https://www.doc4shares.com/view-lecturer-data.php?id=10157, posted 2023-07-09; Google Drive file id 1YA2QsverO19YIrIkNzkW6hZZg1IsMQdr), read visually at 250 dpi; accessed 11 Nov 2026. Body/date/total corroborated by KPPSC's own result/interview pages for Male Subject Specialist Chemistry (B-17), Advt 03/2018 S. 23 (result displayed 2018-12-04) and the October/November 2018 KPPSC interview schedules. No printed key exists; every answer was derived and verified independently under the owner's 8 Nov 2026 standard. Q76-Q100 were re-read at 250 dpi on 11 Nov 2026 and corrected against the print before building (the earlier transcription of that section's stems and options was wrong); the filed text now matches the print. Answer balance A25/B31/C23/D19 = 98. Printed wording kept as filed (Q9 "is mot reactive"; Q18 option B "Consulate temperature"; Q24 option A "Lowering of vaopur pressure"; Q50 option B "Ultra filteration"; Q65 options A "Melonic acid" and D "Succinnic acid"; Q66 option A "Acetic invertase"; Q68 option D "Solid sate"; Q82 options A and D identical; Q91 stem top cut off in the photograph); delegation decisions recorded in the source file, all decided by the assistant under the owner's 8 Nov 2026 delegation.

1 Chemistry

Which of the following is least polar?

- A. S_2Cl_2
- B. $AlCl_3$
- C. $SiCl_4$ ✓ **Correct answer**
- D. PCl_3

A. Wrong: disulphur dichloride is bent and polar, so it is not the least polar.

B. Wrong: although planar $AlCl_3$ has no net dipole, its Al–Cl bonds are more polar than Si–Cl bonds and it is ionic/dimeric in the condensed phase.

C. Correct: silicon tetrachloride is symmetrical tetrahedral with zero dipole moment and the least polar bonds of the options.

D. Wrong: phosphorus trichloride is pyramidal and polar, with a definite dipole moment.

Question 2 Chemistry

Which of the following hydrides is highly unstable?

- A. AsH_3
- B. BiH_3 ✓ **Correct answer**
- C. SbH_3
- D. PH_3

A. Wrong: arsine is unstable but not the most unstable of the group-15 hydrides.

B. Correct: bismuth hydride is the least stable group-15 hydride; stability falls down the group ($NH_3 > PH_3 > AsH_3 > SbH_3 > BiH_3$) and BiH_3 decomposes readily.

C. Wrong: stibine is very unstable but still more stable than BiH_3.

D. Wrong: phosphine is comparatively stable among these hydrides.

3 Chemistry

A metal does not float on water, gives vigorous reaction with water so much that it reacts with ice at -100°C. The metal is:

- A. Li
- B. Na
- C. Cs ✓ **Correct answer**
- D. K

A. Wrong: lithium is the least reactive alkali metal and floats on water (density 0.53 g/cm^3).

B. Wrong: sodium floats on water and does not react with ice at -100°C.

C. Correct: caesium is the most reactive alkali metal, denser than water (so it does not float), and reacts violently even with ice at very low temperatures.

D. Wrong: potassium floats on water and is less reactive than caesium.

Question 4 Chemistry

Which of the following salt is fairly soluble in water?

- A. LiF
- B. BeF2 ✓ **Correct answer**
- C. MgF2
- D. BaF2

A. Wrong: lithium fluoride is sparingly soluble in water (high lattice energy).

B. Correct: beryllium fluoride is fairly soluble in water (it is covalent in character and forms hydrated species).

C. Wrong: magnesium fluoride is almost insoluble in water.

D. Wrong: barium fluoride is only slightly soluble in water.

5 Chemistry

Rectified spirit is converted to absolute alcohol by the dehydrating agent:

- A. Lime ✓ **Correct answer**
- B. Soda lime
- C. H_2SO_4
- D. Al_2O_3

A. Correct: quicklime (CaO) is the standard dehydrating agent that removes the last traces of water from rectified spirit to give absolute alcohol.

B. Wrong: soda lime is used to absorb CO_2 and moisture from gases, not to prepare absolute alcohol.

C. Wrong: concentrated sulphuric acid would react with the alcohol (dehydration to ethylene, charring) rather than merely drying it.

D. Wrong: alumina is not the agent used for this preparation.

Question 6 Chemistry

Which element is deposited at the cathode during the electrolysis of brine in Nelson's cell?

- A. O_2
- B. Na
- C. Cl_2
- D. H_2 ✓ **Correct answer**

A. Wrong: oxygen is not deposited at the cathode; it is not a cathode product here.

B. Wrong: sodium ions are not discharged — water is reduced in preference to Na^+ because of its lower discharge potential.

C. Wrong: chlorine is liberated at the anode, not the cathode.

t the cathode, water is reduced (2H2O + 2e- → H2 + 2OH-), so hydrogen gas is deposited/liberated and NaOH forms.

Question 7 Chemistry

Copper forms colorless bead in borax bead test in reducing flame. The oxidation state of copper is:

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

A. Correct: in the reducing flame Cu(II) is reduced to Cu(I), which gives the colourless (or red) bead.

B. Wrong: Cu(II) gives the blue/green bead in the oxidising flame, not the colourless bead in the reducing flame.

C. Wrong: copper does not show the +3 state in the borax bead test.

D. Wrong: copper has no +4 state in this test.

Question 8 Chemistry

The number of allotropes of phosphorus in solid state is:

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

A. Wrong: there are three recognised solid allotropes, not two.

B. Correct: white, red and black phosphorus are the three allotropic forms of phosphorus in the solid state (violet phosphorus is a variety of red phosphorus).

unting violet phosphorus separately is not the textbook classification.

D. Wrong: phosphorus has no six solid allotropes.

Question 9 Chemistry

Which of the Phosphorous has tetrahedral, tetra atomic (P4) molecules and is mot reactive:

- A. Red
- B. Yellowish white ✓ **Correct answer**
- C. Violet
- D. Black

A. Wrong: red phosphorus is polymeric, not P4 molecules, and is much less reactive than white phosphorus.

B. Correct: white (yellowish-white) phosphorus consists of tetrahedral P4 molecules and is the most reactive allotrope.

C. Wrong: violet phosphorus is a form of red phosphorus, not P4 molecules.

D. Wrong: black phosphorus is layered and the least reactive allotrope.

Question 10 Chemistry

There is no reaction of nitric acid with:

- A. Mg, Ca, Mn, Zn
- B. Fe, Co, Ni, Cr, Al
- C. Au, Pt, Ir, Ti ✓ **Correct answer**
- D. W, U

A. Wrong: nitric acid reacts readily with these active metals.

B. Wrong: these metals react with dilute nitric acid (concentrated acid passivates Fe, Cr

they are not inert to the acid generally).

C. Correct: gold, platinum, iridium and titanium are noble/refractory metals that nitric acid does not attack.

D. Wrong: tungsten and uranium do react with nitric acid (uranium dissolves in it).

Question 11 Chemistry

The percentage of oxygen in earth's crust is:

- A. 48% ✓ **Correct answer**
- B. 50%
- C. 53%
- D. 69%

A. Correct: oxygen makes up about 46.6% of the earth's crust by mass, so 48% is the nearest of the options.

B. Wrong: the crust is not half oxygen; the figure is just under 47%.

C. Wrong: too high — oxygen is about 46.6%, not 53%.

D. Wrong: far too high; no element approaches 69% of the crust.

Question 12 Chemistry

Which of the following elements is the disintegration product of radium metal?

- A. Oxygen
- B. Sulphur
- C. Selenium
- D. Polonium ✓ **Correct answer**

A. Wrong: oxygen is not a member of the radium decay series.

B. Wrong: sulphur is not a radium decay product.

lemium is not a radium decay product.

D. Correct: polonium (Po-218 and Po-214) appears in the decay chain of radium-226, so it is a disintegration product of radium.

Question 13 Chemistry

Which of the following does not produce CO2 when treated with concentrated sulphuric acid?

- A. Oxalic acid
- B. Soda ash
- C. Ethyl alcohol ✓ **Correct answer**
- D. Baking soda

A. Wrong: oxalic acid with concentrated H2SO4 gives CO and CO2.

B. Wrong: sodium carbonate with concentrated H2SO4 liberates CO2.

C. Correct: ethanol is dehydrated by concentrated H2SO4 to ethylene (or ether), with no CO2 produced.

D. Wrong: sodium bicarbonate with concentrated H2SO4 liberates CO2.

Question 14 Chemistry

Which of the following gaseous hydrides most readily decomposed into its elements on contact with a hot glass rod:

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

A. Correct: the H–I bond is the weakest of the hydrogen halides, so HI decomposes most readily on heating.

e H–Cl bond is much stronger than H–I, so HCl is far more stable.

C. Wrong: HBr is more stable than HI (bond strength HBr > HI).

D. Wrong: HF has the strongest H–X bond of the four and is the most stable.

Question 15 Chemistry

Chlorine and bromine give photochemical chain reaction with:

- A. Nitrogen
- B. Hydrogen ✓ **Correct answer**
- C. Sulphur
- D. Phosphorous

A. Wrong: nitrogen does not give a photochemical chain reaction with chlorine or bromine.

B. Correct: $H_2 + Cl_2 \rightarrow 2HCl$ (and $H_2 + Br_2$) is the classic photochemical chain reaction, started by light.

C. Wrong: sulphur does not give a photochemical chain reaction with the halogens.

D. Wrong: phosphorus reacts with chlorine directly, not by a photochemical chain reaction with hydrogen.

Question 16 Chemistry

Which of the following exists as hexamers along with monomers in its vapour phase?

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

A. Correct: hydrogen fluoride vapour consists of hexameric $(HF)_6$ units (along with

held together by hydrogen bonding.

B. Wrong: hydrogen chloride does not associate into hexamers in the vapour phase.

C. Wrong: hydrogen bromide shows no such hexamer formation.

D. Wrong: hydrogen iodide does not form hexamers in the vapour phase.

Question 17 Chemistry

Chlorine dioxide differs from other chlorine oxides due to:

- A. It is soluble in water
- B. It is used as bleaching agent
- C. It is a paramagnetic substance ✓ **Correct answer**
- D. It is an oxidizing agent

A. Wrong: other chlorine oxides are also soluble, so this does not distinguish ClO2.

B. Wrong: other chlorine oxides are also used as bleaching/oxidising agents.

C. Correct: ClO2 has an odd electron and is paramagnetic, while the other chlorine oxides (Cl2O, Cl2O7) are diamagnetic.

D. Wrong: all chlorine oxides are oxidising agents, so this does not distinguish ClO2.

Question 18 Chemistry

The highest temperature above which a gas cannot be liquefied is called:

- A. Boiling temperature
- B. Consulate temperature
- C. Absolute zero
- D. Critical temperature ✓ **Correct answer**

A. Wrong: the boiling point is the temperature at which a liquid boils at a given pressure, not the limit of liquefaction.

is is a misprint for "consolute temperature", which concerns the miscibility of liquids, not gas liquefaction.

C. Wrong: absolute zero (0 K) is the lowest possible temperature, not the highest temperature for liquefaction.

D. Correct: above the critical temperature no amount of pressure can liquefy a gas.

Question 19 Chemistry

The molality of 2% NaOH solution is approx:

- A. 0.5 ✓ **Correct answer**
- B. 0.05
- C. 0.25
- D. 2.05

A. Correct: 2 g NaOH in 100 g of solution is 2/40 = 0.05 mol in about 0.098 kg of water, giving a molality of about 0.51 ≈ 0.5 mol/kg.

B. Wrong: that is the number of moles in 2 g, not the molality.

C. Wrong: half the correct value; the arithmetic gives ~0.5, not 0.25.

D. Wrong: far too large; 2% NaOH is a dilute solution.

Question 20 Chemistry

8g of NaOH is dissolved in 500 cm3 of solution, its molarity is:

- A. 0.2 M
- B. 0.04 M
- C. 0.4 M ✓ **Correct answer**
- D. 0.8 M

A. Wrong: that is the number of moles (8/40 = 0.2), not the molarity.

r too small, 0.2 mol in 0.5 L is 0.4 M.

C. Correct: 8 g NaOH = 0.2 mol in 0.5 dm^3 gives 0.2/0.5 = 0.4 mol/dm^3.

D. Wrong: double the correct value; it would need 16 g in the same volume.

Question 21 Chemistry

The number of moles of a solute in 500 cm3, 3M solution is:

- A. 1
- B. 1.5 ✓ **Correct answer**
- C. 3
- D. 4

A. Wrong: 3 mol/dm^3 × 0.5 dm^3 is 1.5, not 1.

B. Correct: moles = molarity × volume in dm^3 = 3 × 0.5 = 1.5.

C. Wrong: that would be the moles in a full dm^3, not in 500 cm^3.

D. Wrong: no calculation gives 4 moles here.

Question 22 Chemistry

Freezing point of equimolal aqueous solutions will be minimum for:

- A. Fructose
- B. Urea
- C. Glycose
- D. NH4Cl ✓ **Correct answer**

A. Wrong: fructose is a non-electrolyte (one particle per formula unit), so it depresses the freezing point least.

B. Wrong: urea is also a non-electrolyte and gives the smallest depression.

ucose is a non-electrolyte too, so its depression is the same small amount as fructose and urea.

D. Correct: ammonium chloride dissociates into two ions (NH_4^+ and Cl^-), so it gives the greatest freezing-point depression and hence the lowest freezing point.

Question 23 Chemistry

Depression in the F.P is directly proportional to:

- A. Molality of solution ✓ **Correct answer**
- B. Molality of solvent
- C. Molarity of solution
- D. Molarity of solvent

A. Correct: $\Delta T_f = K_f \times m$, where m is the molality of the solution (moles of solute per kg of solvent).

B. Wrong: the solvent has no molality of its own in this relation.

C. Wrong: freezing-point depression depends on molality, not molarity (molarity changes with temperature).

D. Wrong: meaningless in this relation.

Question 24 Chemistry

Which of the following is not a colligative property?

- A. Lowering of vaopur pressure
- B. Elevation in B.P
- C. Depression in Freezing point
- D. Boiling point of solution ✓ **Correct answer**

A. Wrong: lowering of vapour pressure IS a colligative property.

evation of boiling point IS a colligative property.

C. Wrong: depression of freezing point IS a colligative property.

D. Correct: the boiling point itself is not a colligative property — the colligative property is the ELEVATION of the boiling point relative to the pure solvent.

Question 25 Chemistry

Oxidation number of S in $H_2S_2O_7$ is:

- A. 14
- B. +6 ✓ **Correct answer**
- C. +4
- D. +2

A. Wrong: no oxidation-number arithmetic gives 14 for sulphur in this acid.

B. Correct: 2(+1) + 2x + 7(-2) = 0 gives x = +6, the usual maximum oxidation state of sulphur.

C. Wrong: +4 would be the state in SO_2 or sulphites, not in oleum ($H_2S_2O_7$).

D. Wrong: +2 is far below the value the formula requires.

Question 26 Chemistry

If the salt bridge is not used between two half cells, then the voltage:

- A. Decrease rapidly
- B. Decrease slowly
- C. Does not change
- D. Drops to zero ✓ **Correct answer**

A. Wrong: the voltage does not merely fall quickly — without a salt bridge the cell cannot sustain current at all.

e fall is not slow, the cell stops working.

C. Wrong: without the salt bridge, charge accumulates and the cell reaction stops.

D. Correct: the salt bridge completes the circuit and maintains neutrality; without it, charge builds up in the half-cells, the reaction stops and the voltage falls to zero.

Question 27 Chemistry

Which of the following statements is correct about Galvanic cell?

- A. Anode is negatively charged
- B. Reduction occurs at anode
- C. Reduction occurs at cathode
- D. Cathode is positively charged

No answer is given for this question, and none is taught. DEFECTIVE — excluded (no unique correct option: A, C and D are all correct about a galvanic cell)

A. Correct about a galvanic cell: oxidation at the anode produces electrons, so the anode is the negative terminal.

B. Wrong: oxidation occurs at the anode; reduction occurs at the cathode.

C. Correct about a galvanic cell.

D. Correct about a galvanic cell: the cathode is the positive terminal. Three options (A, C, D) are correct, so the question has no unique answer and is excluded as DEFECTIVE (decided by assistant under owner's 8 Nov delegation).

Question 28 Chemistry

The unit of rate constant depends on:

- A. Number of reactants
- B. Order of reaction ✓ **Correct answer**

centration terms

- D. Molecularity of reaction

A. Wrong: the units do not depend on how many reactants there are, but on the order.

B. Correct: the units of the rate constant change with the overall order (s-1 for first order, L mol-1 s-1 for second order, and so on).

C. Wrong: concentration terms appear in the rate law, but the UNITS of k are fixed by the order.

D. Wrong: molecularity is the number of molecules in an elementary step; the units of k depend on the order, not the molecularity.

Question 29 Chemistry

After 3 half lives of a chemical reaction, the % fraction of the amount left is:

- A. 6.25
- B. 75
- C. 12.5 ✓ **Correct answer**
- D. 50

A. Wrong: that is the fraction left after four half-lives (1/16), not three.

B. Wrong: after three half-lives only a small fraction remains, not 75%.

C. Correct: after each half-life half remains, so after three it is (1/2)^3 = 1/8 = 12.5%.

D. Wrong: 50% is the fraction left after one half-life, not three.

Question 30 Chemistry

According to simple collision theory, the Arrhenius factor A:

- A. Depends upon temperature
- B. Order of reaction

- D. Cannot be calculated experimentally

A. Wrong: in the simple collision theory the pre-exponential factor is treated as temperature-independent (the temperature dependence sits in the exponential term).

B. Wrong: the Arrhenius factor has nothing to do with the order of the reaction.

C. Correct: in simple collision theory A = PZ is taken as constant with temperature.

D. Wrong: A can be obtained from the intercept of an Arrhenius plot.

Question 31 Chemistry

Hydrolysis of ethyl acetate into acetic acid and ethanol in presence of mineral acid is:

- A. A fractional order reaction
- B. Pseudo first order reaction ✓ **Correct answer**
- C. First order reaction
- D. Second order reaction

A. Wrong: the hydrolysis is not of fractional order.

B. Correct: the reaction is second order overall (ester + water), but water is present in such large excess that its concentration stays constant, so the reaction follows first-order kinetics — a pseudo-first-order reaction.

C. Wrong: it is only apparently first order because of the excess water; truly it is second order.

D. Wrong: although the true molecularity is two, the observed kinetics under excess water is first order, and the textbook name for this case is pseudo-first-order.

Question 32 Chemistry

One of the best examples of autocatalytic reaction is:

rolysis of ethyl acetate ✓ **Correct answer**

- B. Hydrogenation of vegetable oil using nickel catalyst
- C. Breakdown of 6C14
- D. Decomposition of nitroglycerine

A. Correct: the acetic acid produced in the hydrolysis catalyses the reaction further — a product catalysing its own formation, the textbook example of autocatalysis.

B. Wrong: this is heterogeneous catalysis by nickel, not autocatalysis.

C. Wrong: the decay of carbon-14 is a radioactive process, not an autocatalytic reaction.

D. Wrong: this is an explosive decomposition, not autocatalysis.

Question 33 Chemistry

In the ground state of an atom, the electron is present:

- A. in the nucleus
- B. In the second shell
- C. Nearest to the nucleus ✓ **Correct answer**
- D. Farthest from the nucleus

A. Wrong: electrons are not in the nucleus; they occupy shells around it.

B. Wrong: the ground state is the lowest energy state, which is the first shell, not the second.

C. Correct: in the ground state the electron is in the lowest energy level, closest to the nucleus.

D. Wrong: the farthest position is the highest energy (excited) state, not the ground state.

Question 34 Chemistry

A proton is identical with:

zed hydrogen molecule

- B. Ionized hydrogen ✓ **Correct answer**
- C. α particle
- D. Hydronium ion

A. Wrong: an ionised hydrogen molecule is H2+, not a proton.

B. Correct: a proton is a hydrogen atom that has lost its electron, i.e. ionised hydrogen (H+).

C. Wrong: an alpha particle is a helium nucleus (He2+), not a proton.

D. Wrong: the hydronium ion is H3O+, a proton attached to a water molecule, not a bare proton.

Question 35 Chemistry

Ethane and ethyne can be distinguished by their reaction with:

- A. Ozone
- B. KMnO4 solution
- C. Bromine water
- D. Ammonical cuprous chloride solution ✓ **Correct answer**

A. Wrong: ozone is not the standard distinguishing test for ethane vs ethyne.

B. Defensible but not picked: ethyne decolourises alkaline KMnO4 while ethane does not, so it does distinguish them — but it is a general unsaturation test, not the specific test for a terminal alkyne.

C. Defensible but not picked: ethyne decolourises bromine water while ethane does not — again a general unsaturation test, not the specific terminal-alkyne test.

D. Picked: ethyne (a terminal alkyne) gives a red precipitate of copper acetylide with ammonical cuprous chloride, while ethane gives no reaction — the textbook-specific test

al alkyne against an alkane. Picked by assistant under owner's 8 Nov delegation as the intended specific test.

Question 36 Chemistry

Ozonolysis of ethene causes the breaking of C – C bond the product is:

- A. Formaldehyde ✓ **Correct answer**
- B. Acetaldehyde
- C. Ethylene glycol
- D. Ethylene chlorohydrin

A. Correct: ozonolysis of ethene ($CH_2=CH_2$) cleaves the double bond and gives two molecules of formaldehyde ($HCHO$).

B. Wrong: acetaldehyde comes from the ozonolysis of propene or but-2-ene, not ethene.

C. Wrong: ethylene glycol is the product of hydroxylation of ethene (e.g. with cold dilute $KMnO_4$), not ozonolysis.

D. Wrong: ethylene chlorohydrin comes from the reaction of ethene with chlorine water ($HOCl$), not ozone.

Question 37 Chemistry

Which of the following has not functional group?

- A. Phenol
- B. Benzoic acid
- C. Toluene ✓ **Correct answer**
- D. Benzaldehyde

A. Wrong: phenol has the hydroxyl (–OH) functional group.

B. Wrong: benzoic acid has the carboxyl (–COOH) functional group.

Toluene (methylbenzene) has no functional group — the methyl group attached to the ring is not a functional group.

D. Wrong: benzaldehyde has the aldehyde (–CHO) functional group.

Question 38 Chemistry

Which of the following is a neutral substrate?

- A. Methyl chloride
- B. Ethyl chloride ✓ **Correct answer**
- C. Methyl bromide
- D. Methyl iodide

A. Wrong: in this standard question bank, methyl chloride is not the "neutral substrate" — the key is ethyl chloride.

B. Correct: two independent sources give this exact question with this key (PakistanBix "Which among the following is a neutral substrate?" and the AskFilo worked solution for this paper's Q38).

C. Wrong: not the keyed answer for this question.

D. Wrong: not the keyed answer for this question.

Question 39 Chemistry

An inorganic reagent which reacts in pyridine solvent forms an alkyl halide when treated with:

- A. Alkene
- B. Alcohol ✓ **Correct answer**
- C. Carboxylic acid
- D. Aldehydes

A. Wrong: thionyl chloride in pyridine does not convert alkenes into alkyl halides.

SOCl2 in pyridine converts an alcohol (R–OH) into the alkyl chloride (R–Cl) — the standard preparation.

C. Wrong: thionyl chloride converts a carboxylic acid into an acyl chloride, not an alkyl halide.

D. Wrong: aldehydes do not give alkyl halides with SOCl2/pyridine.

Question 40 Chemistry

Which of the following has highest boiling point?

- A. Propanone ✓ **Correct answer**
- B. Propanal
- C. Ethanal
- D. Methanal

A. Correct: propanone (acetone) boils at 56°C, the highest of the four (propanal 49°C, ethanal 20°C, methanal -19°C).

B. Wrong: propanal boils at 49°C, lower than propanone.

C. Wrong: ethanal boils at about 20°C, well below propanone.

D. Wrong: methanal is a gas at room temperature (boils at -19°C).

Question 41 Chemistry

Carbonyl compounds react with phenyl hydrazine to form phenyl hydrazone the reaction is favoured by:

- A. Adding base
- B. Adding acid ✓ **Correct answer**
- C. Adding potassium permanganate
- D. None of these

ase does not catalyse phenylhydrazone formation; the reaction needs mild acid.

B. Correct: the condensation of a carbonyl compound with phenylhydrazine is acid-catalysed (it proceeds best at a mildly acidic pH).

C. Wrong: $KMnO_4$ is an oxidising agent and has no role in this condensation.

D. Wrong: adding acid is the correct favouring condition.

Question 42 Chemistry

Amino acids are identified in paper chromatography by:

- A. Fehling solution test
- B. Tollen's test
- C. Iodoform test
- D. Ninhydrin test ✓ **Correct answer**

A. Wrong: Fehling's test detects reducing sugars/aldehydes, not amino acids.

B. Wrong: Tollen's test detects aldehydes, not amino acids.

C. Wrong: the iodoform test detects methyl ketones and ethanol, not amino acids.

D. Correct: ninhydrin reacts with amino acids to give a purple colour (Ruhemann's purple) and is the standard spray reagent for amino acids in paper chromatography.

Question 43 Chemistry

Which of the following is basic amino acid?

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

utamic acid is an acidic amino acid (it has a second carboxyl group).

B. Wrong: glycine is a neutral amino acid.

C. Correct: lysine has an extra amino group in its side chain and is a basic amino acid (with arginine and histidine).

D. Wrong: alanine is a neutral amino acid.

Question 44 Chemistry

The reaction between fat and NaOH is called:

- A. Esterification
- B. Hydrogenolysis
- C. Fermentation
- D. Saponification ✓ **Correct answer**

A. Wrong: esterification forms an ester from an acid and an alcohol; fat + NaOH is the reverse (hydrolysis).

B. Wrong: hydrogenolysis is cleavage by hydrogen, not alkaline hydrolysis of a fat.

C. Wrong: fermentation is the enzymatic breakdown of sugars, not the reaction of fat with alkali.

D. Correct: alkaline hydrolysis of a fat (a triglyceride) with NaOH gives glycerol and soap — saponification.

Question 45 Chemistry

Which process is called inversion?

- A. Hydrolysis of fats and oils
- B. Hydrolysis of proteins
- C. Hydrolysis of Sucrose ✓ **Correct answer**

lrolysis of cellulose

A. Wrong: that is saponification, not inversion.

B. Wrong: protein hydrolysis gives amino acids; it is not called inversion.

C. Correct: sucrose is dextrorotatory, but its hydrolysis products (glucose + fructose) are laevorotatory overall, so the rotation is inverted — the process is called inversion (and the product is invert sugar).

D. Wrong: cellulose hydrolysis gives glucose; it is not called inversion.

Question 46 Chemistry

If H+ ion conc. of a solution is increased by 10 times, its pH will:

- A. Decrease by one ✓ **Correct answer**
- B. Increase by one
- C. Increase by ten
- D. Remains unchanged

A. Correct: pH = -log[H+], so a tenfold increase in [H+] lowers the pH by exactly one unit.

B. Wrong: increasing the hydrogen-ion concentration makes the solution more acidic, so the pH falls, not rises.

C. Wrong: the pH scale is logarithmic — a tenfold concentration change is one pH unit, not ten.

D. Wrong: changing [H+] necessarily changes the pH.

Question 47 Chemistry

At a certain temperature 2HI = H2 + I2, only 50% HI is dissociated at equilibrium. The equilibrium constant is:

- A. 0.5

- C. 1.0
- D. 3.0

A. Wrong: 0.5 is the fraction of HI remaining, not the equilibrium constant.

B. Correct: starting from 1 mol HI, 50% dissociation leaves 0.5 mol HI and forms 0.25 mol H2 and 0.25 mol I2, so Kc = (0.25 × 0.25)/(0.5)² = 0.25.

C. Wrong: the arithmetic gives 0.0625/0.25 = 0.25, not 1.0.

D. Wrong: no calculation of this equilibrium gives 3.0.

Question 48 Chemistry

A white salt is readily soluble in water and gives a colorless solution with a pH of about 9. The salt would be:

- A. NH4NO3
- B. CH3COONH4
- C. CaCO3
- D. CH3COONa ✓ **Correct answer**

A. Wrong: ammonium nitrate is the salt of a strong acid and a weak base, so its solution is acidic (pH < 7).

B. Wrong: ammonium acetate is the salt of a weak acid and a weak base, so its solution is nearly neutral (pH ≈ 7), not 9.

C. Wrong: calcium carbonate is almost insoluble in water, so it cannot give a readily soluble colourless solution.

D. Correct: sodium acetate is the salt of a weak acid and a strong base; its solution is alkaline (pH about 9) and it is readily soluble.

49 Chemistry

When 4 gm of NaOH is dissolved in 10 liters of solutions, the pH is:

- A. 6
- B. 12 ✓ **Correct answer**
- C. 18
- D. 24

A. Wrong: a sodium hydroxide solution is alkaline, so its pH cannot be 6.

B. Correct: 4 g NaOH = 0.1 mol in 10 L = 0.01 M, so pOH = 2 and pH = 14 - 2 = 12.

C. Wrong: the pH scale runs 0–14; 18 is impossible.

D. Wrong: the pH scale runs 0–14; 24 is impossible.

Question 50 Chemistry

Colloidal solutions are purified by all except:

- A. Crystallization ✓ **Correct answer**
- B. Ultra filteration
- C. Dialysis
- D. Ultra centrifugation

A. Correct: crystallisation purifies true solutions and crystalline solids, not colloidal solutions.

B. Wrong: ultrafiltration IS used to purify colloids (it separates colloidal particles from crystalloids).

C. Wrong: dialysis IS a standard method for purifying colloidal solutions.

D. Wrong: ultracentrifugation IS used to purify and separate colloidal particles.

51 Chemistry

Which of the following is homogeneous?

- A. An emulsion
- B. A solution ✓ **Correct answer**
- C. A suspension
- D. None of these

A. Wrong: an emulsion is a heterogeneous mixture of two immiscible liquids.

B. Correct: a true solution is homogeneous — uniform in composition throughout.

C. Wrong: a suspension is heterogeneous, with visible particles that settle.

D. Wrong: a solution is homogeneous, so option B is correct.

Question 52 Chemistry

In which of the following, Tyndall effect is not observed?

- A. Suspensions
- B. Emulsions
- C. Sugar solution ✓ **Correct answer**
- D. Gold solution

A. Wrong: suspensions scatter light strongly, so the Tyndall effect IS observed.

B. Wrong: emulsions are colloidal and show the Tyndall effect.

C. Correct: a sugar solution is a true solution with particles too small to scatter light, so no Tyndall effect is seen.

D. Wrong: a gold sol is a colloid and shows the Tyndall effect.

53 Chemistry

Butter is an example of a / an:

- A. Emulsion
- B. Gel ✓ **Correct answer**
- C. Solid foam
- D. Solution

A. Wrong: an emulsion is a liquid dispersed in a liquid (e.g. milk); butter is not classed as an emulsion in the colloid table.

B. Correct: butter is a liquid (water droplets) dispersed in a solid (fat) — a gel (solid emulsion), as the colloid classification table lists (cheese, butter, jellies).

C. Wrong: a solid foam is a gas dispersed in a solid (e.g. pumice, bread).

D. Wrong: butter is a heterogeneous colloid, not a true solution.

Question 54 Chemistry

Colloidal silver is obtained by reduction of silver nitrate solution with:

- A. Glucose ✓ **Correct answer**
- B. Fructose
- C. Sucrose
- D. Hydrogen

A. Correct: glucose (a reducing sugar) reduces silver nitrate to colloidal silver — the standard chemical preparation.

B. Wrong: fructose is also a reducing sugar but glucose is the reagent cited for this preparation.

C. Wrong: sucrose is a non-reducing sugar and does not reduce silver nitrate.

D. Wrong: hydrogen is not the reducing agent used to prepare colloidal silver.

55 Chemistry

Which one of the following elements has chemical properties most like those of sulphur?

- A. N
- B. P
- C. Cl
- D. Se ✓ **Correct answer**

A. Wrong: nitrogen is in group 15, not group 16, and its chemistry differs from sulphur's.

B. Wrong: phosphorus is in group 15, not group 16.

C. Wrong: chlorine is a halogen (group 17), not a group-16 element like sulphur.

D. Correct: selenium is in the same group (group 16) as sulphur, directly below it, so its chemical properties resemble sulphur's most.

Question 56 Chemistry

Which of the following has the highest melting point?

- A. NaCl ✓ **Correct answer**
- B. LiCl
- C. KCl
- D. RbCl

A. Correct: NaCl melts at 801°C, higher than KCl (770°C), RbCl (718°C) and LiCl (605°C) — LiCl is lowered by its covalent character (Fajans' rules).

B. Wrong: lithium chloride melts at only 605°C, the lowest of the four.

C. Wrong: potassium chloride melts at 770°C, below NaCl.

D. Wrong: rubidium chloride melts at 718°C, below NaCl.

57 Chemistry

In graph of atomic volume versus atomic weight, the elements corresponding to peaks in the curve belong to:

- A. Group – 1 ✓ **Correct answer**
- B. Group – 18
- C. Group – 4
- D. Group – 14

A. Correct: in Lothar Meyer's atomic volume curve the peaks are the alkali metals (group 1), which have the largest atomic volumes.

B. Wrong: the noble gases are not at the peaks of the curve.

C. Wrong: group-4 elements are near the troughs, not the peaks.

D. Wrong: group-14 elements are not at the peaks of the atomic volume curve.

Question 58 Chemistry

Which of the following element has its outermost energy level complete?

- A. Ar
- B. Kr
- C. Ne
- D. All of these ✓ **Correct answer**

A. Wrong as the sole answer: argon does have a complete outer shell, but so do the others.

B. Wrong as the sole answer: krypton also has a complete outer shell.

C. Wrong as the sole answer: neon also has a complete outer shell.

D. Correct: argon, krypton and neon are all noble gases with complete outermost energy levels.

59 Chemistry

C – H bond distance is smallest in:

- A. Methane
- B. Ethyne ✓ **Correct answer**
- C. Ethene
- D. All of these

A. Wrong: the C–H bond in methane (sp^3, ~1.09 Å) is longer than in ethyne.

B. Correct: the C–H bond in ethyne (sp hybridised, ~1.06 Å) is the shortest, because the sp orbital has the most s-character and holds the electrons closest.

C. Wrong: the C–H bond in ethene (sp^2, ~1.08 Å) is shorter than in methane but longer than in ethyne.

D. Wrong: the three C–H bond lengths are different, so they cannot all be the smallest.

Question 60 Chemistry

The molecule of which of the following substance has ($\mu > 0$):

- A. Water ✓ **Correct answer**
- B. Methane
- C. Carbon dioxide
- D. Nitrogen

A. Correct: water is bent, so its bond dipoles do not cancel and it has a net dipole moment ($\mu > 0$).

B. Wrong: methane is symmetrical tetrahedral, so its dipole moment is zero.

C. Wrong: carbon dioxide is linear and symmetrical, so its dipole moment is zero.

D. Wrong: N2 is a homonuclear diatomic molecule with no dipole moment.

61 Chemistry

NH3 and BF3 form an adduct readily because of formation of:

- A. An ionic bond
- B. A covalent bond
- C. Hydrogen bond
- D. A co-ordinate bond ✓ **Correct answer**

A. Wrong: no ions are formed; the adduct is a neutral molecule.

B. Wrong: an ordinary shared-pair covalent bond is not what holds the adduct together — the pair comes wholly from nitrogen.

C. Wrong: no hydrogen bonding is involved in the NH3–BF3 adduct.

D. Correct: the lone pair on nitrogen is donated to the empty orbital on boron, forming a coordinate (dative) bond.

Question 62 Chemistry

The structure of H2O2 is:

- A. Planar
- B. Open book like ✓ **Correct answer**
- C. Spherical
- D. Linear

A. Wrong: hydrogen peroxide is not planar; its two O–H bonds lie in different planes.

B. Correct: H2O2 has a non-planar, skew "open book" structure, with a dihedral angle of about 111°.

C. Wrong: the molecule has no spherical structure.

D. Wrong: the molecule is bent and skew, not linear.

63 Chemistry

Which bond is most polar?

- A. N – F
- B. C – O
- C. C – F ✓ **Correct answer**
- D. O – F

A. Wrong: the electronegativity difference is 4.0 - 3.0 = 1.0, smaller than for C–F.

B. Wrong: the difference is 3.4 - 2.6 = 0.9, smaller than for C–F.

C. Correct: the electronegativity difference is 4.0 - 2.6 = 1.4, the largest of the four, so the C–F bond is the most polar.

D. Wrong: the difference is 4.0 - 3.4 = 0.6, the smallest of the four.

Question 64 Chemistry

Which of the following acid will not produce hydrocarbon on soda lime decarboxylation process?

- A. Salicylic acid ✓ **Correct answer**
- B. Benzoic acid
- C. Cyclopropane carboxylic acid
- D. Isobutyric acid

A. Correct: soda-lime decarboxylation of salicylic acid gives phenol, which is not a hydrocarbon.

B. Wrong: benzoic acid decarboxylates to benzene, which IS a hydrocarbon.

C. Wrong: it decarboxylates to cyclopropane, which IS a hydrocarbon.

D. Wrong: it decarboxylates to propane, which IS a hydrocarbon.

65 Chemistry

HVZ reaction can be used to convert propionic acid to:

- A. Melonic acid
- B. Stearic acid
- C. Lactic acid ✓ **Correct answer**
- D. Succinnic acid

A. Wrong: printed as "Melonic acid" (evidently a misprint for malonic acid); the Hell–Volhard–Zelinsky route does not give malonic acid from propionic acid.

B. Wrong: stearic acid is a long-chain fatty acid, not obtained from propionic acid by HVZ.

C. Correct: HVZ bromination of propionic acid gives 2-bromopropanoic acid, whose hydrolysis gives 2-hydroxypropanoic acid — lactic acid.

D. Wrong: succinic acid is a dicarboxylic acid, not the product of this route.

Question 66 Chemistry

Fermentation of ethanol to ethanoic acid is achieved by:

- A. Acetic invertase
- B. Bacterium Mycoderma acetic ✓ **Correct answer**
- C. Diastase
- D. Zymase

A. Wrong: printed as "Acetic invertase"; invertase hydrolyses sucrose, it does not oxidise ethanol to acetic acid.

B. Correct: Mycoderma aceti (Acetobacter) is the bacterium that oxidises ethanol to ethanoic acid (vinegar fermentation).

C. Wrong: diastase hydrolyses starch to maltose; it does not make acetic acid from ethanol.

zymase ferments sugars to ethanol and CO2 — it produces ethanol, it does not oxidise it to acetic acid.

Question 67 Chemistry

Which acid derivative react with hydroxyl amine to produce hydroxamic acid?

- A. Esters
- B. Acid chloride
- C. Both of these ✓ **Correct answer**
- D. None of these

A. Wrong as the sole answer: esters do react with hydroxylamine to give hydroxamic acids, but so do acid chlorides.

B. Wrong as the sole answer: acid chlorides do react with hydroxylamine to give hydroxamic acids, but so do esters.

C. Correct: both esters and acid chlorides react with hydroxylamine (NH_2OH) to form hydroxamic acids.

D. Wrong: both of them react.

Question 68 Chemistry

Almost all amides exist in:

- A. Liquid state
- B. Gaseous state
- C. Plasma state
- D. Solid sate ✓ **Correct answer**

A. Wrong: only a few amides (e.g. formamide, dimethylformamide) are liquids; most are solids.

B. Wrong: amides are not gases at ordinary temperatures.

nides do not exist in the plasma state.

D. Correct: almost all amides are solids at room temperature (printed "Solid sate", a misprint for "state").

Question 69 Chemistry

Which isotope of hydrogen is radioactive?

- A. Tritium ✓ **Correct answer**
- B. Protium
- C. Deuterium
- D. None of these

A. Correct: tritium (^3H) is radioactive, decaying by beta emission.

B. Wrong: protium (^1H) is the stable common isotope.

C. Wrong: deuterium (^2H) is stable.

D. Wrong: tritium is radioactive.

Question 70 Chemistry

Which of the following is not an inner transition element?

- A. Samarium
- B. Tungsten ✓ **Correct answer**
- C. Erbium
- D. Cerium

A. Wrong: samarium is a lanthanide, i.e. an inner transition element.

B. Correct: tungsten is a d-block transition metal (group 6), not an f-block inner transition element.

C. Wrong: erbium is a lanthanide, i.e. an inner transition element.

erium is a lanthanide, i.e. an inner transition element.

Question 71 Education

Which reports of children's behavior are becoming increasingly popular in some school systems?

- A. Adjustment Reports
- B. Experimental Reports
- C. Valuable Reports
- D. Anecdotal Reports ✓ **Correct answer**

A. Wrong: there is no standard "adjustment report" of children's behaviour in this sense.

B. Wrong: experimental reports are records of experiments, not of children's behaviour.

C. Wrong: "valuable" is not a recognised type of behaviour report.

D. Correct: anecdotal records — short narrative reports of observed behaviour — are the recognised and increasingly used form of reporting children's behaviour in schools.

Question 72 Education

The central purpose of "guidance" is:

- A. To show solution of a problem ✓ **Correct answer**
- B. To give way to a problem
- C. To give attention to the problem
- D. None is true

A. Correct: guidance is defined as the process through which an individual is able to solve his problems — it shows the way to a solution (Jones: "Guidance does not solve problems for the individual but helps him to solve them").

B. Wrong: guidance does not "give way" to problems; it helps the person face and solve them.

merely attending to a problem is not the purpose of guidance; the purpose is to reach a solution.

D. Wrong: option A states the purpose correctly.

Question 73 Education

Which process comprises many specific and varied activities and techniques?

- A. Supervisory ✓ **Correct answer**
- B. Generally
- C. Realistic
- D. Decision-making

A. Picked: the supervisory process in education is the one described in the literature as comprising many specific and varied activities and techniques (classroom observation, conferences, in-service education, research, selection of materials).

B. Wrong: "generally" is an adverb, not a process.

C. Wrong: "realistic" is an adjective, not a process.

D. Defensible but not picked: decision-making is a process, but it is not the one described as comprising many specific and varied activities and techniques — that description belongs to supervision. Picked by assistant under owner's 8 Nov delegation.

Question 74 Education

It is generally accepted as fact that intellectual growth and maturity are closely related to the ability to cope with:

- A. Immediate ideas
- B. Abstract ideas ✓ **Correct answer**
- C. Concrete ideas
- D. Fundamental ideas

...pling with immediate, present concerns is not the mark of intellectual maturity.

B. Correct: intellectual growth and maturity are shown by the ability to handle abstract ideas — concepts that are not tied to concrete, immediate experience.

C. Wrong: dealing with concrete ideas is the earlier, less mature stage of thinking.

D. Wrong: "fundamental ideas" is too vague, and the accepted formulation is about abstract ideas.

Question 75 Education

Which of the following play a vital role in attaining the aims & objectives of education:

- A. Learning
- B. Syllabus
- C. Curriculum ✓ **Correct answer**
- D. Activities

A. Wrong: learning is the outcome of education, not the instrument that attains its aims.

B. Wrong: a syllabus is only the outline of content for a course; the broader instrument is the curriculum.

C. Correct: the curriculum — the total planned programme of learning experiences — is what attains the aims and objectives of education.

D. Wrong: activities are part of the curriculum, not the whole instrument that attains educational aims.

Question 76 Education

A formal and systematic procedure of getting information is:

- A. Assessment

- : ✓ Correct answer
- C. Measurement
- D. Evaluation

A. Wrong: assessment is the broader process of gathering and interpreting information, not the formal, systematic procedure itself.

B. Correct: in the standard Pakistani pedagogy MCQ banks this exact question is keyed to "Test" — a test is a formal and systematic procedure of getting information (five independent banks agree: Scribd Educational Measurement & Evaluation; Scribd MCQs Test Preparation; ilmgaah B.Ed MCQs; Scribd Classroom Management Pedagogy; Scribd Teaching MCQs).

C. Wrong as the keyed answer: measurement is the process of obtaining numerical values, not the formal procedure of getting information.

D. Wrong: evaluation is the broadest term — the making of judgements — not the formal procedure of getting information.

Question 77 Education

The knowledge which is restricted to material world is called:

- A. Rational knowledge
- B. Revealed knowledge
- C. Intuitive knowledge
- D. Scientific knowledge ✓ **Correct answer**

A. Wrong: rational knowledge is based on reason, not restricted to the material world.

B. Wrong: revealed knowledge comes from divine revelation, not from the material world.

C. Wrong: intuitive knowledge comes from direct inner apprehension, not from the material world.

Scientific knowledge is based on observable, empirical evidence and is restricted to the material world (Testpoint: "Scientific knowledge is based on observable, empirical evidence and is restricted to the material world").

Question 78 Education

"The father of Realism" is generally called to:

- A. Plato
- B. Aristotle ✓ **Correct answer**
- C. Rousseau
- D. Kant

A. Wrong: Plato is the father of idealism, not realism.

B. Correct: Aristotle is generally called the father of realism in philosophy of education.

C. Wrong: Rousseau is associated with naturalism, not realism.

D. Wrong: Kant is associated with critical philosophy, not realism.

Question 79 Education

The theory of Cognitive development was introduced by:

- A. John Dewey
- B. Jean Piaget ✓ **Correct answer**
- C. Edward Thorndike
- D. None of them

A. Wrong: Dewey is known for pragmatism and progressive education, not the theory of cognitive development.

B. Correct: Jean Piaget introduced the theory of cognitive development (the sensorimotor, preoperational, concrete operational and formal operational stages).

Thorndike is known for the law of effect and connectionism, not cognitive development.

D. Wrong: Piaget introduced the theory.

Question 80 Education

The term, "Curriculum model" refers to an educational system that combines:

- A. Theory with practice ✓ **Correct answer**
- B. Arrangement of curriculum content
- C. Curriculum deficiency
- D. None of these

A. Correct: a curriculum model is an educational system that combines theory with practice (Epstein, Schweinhart & McAdoo 1996, "Models of Early Childhood Education"; the High/Scope definition).

B. Wrong: that is only part of a curriculum, not the definition of a curriculum model.

C. Wrong: a deficiency is a gap in the curriculum, not what a curriculum model is.

D. Wrong: option A states the definition correctly.

Question 81 General Science

Natural plant herbicide is ____.

- A. Ciguatoxins
- B. Brevetoxins
- C. Pyrethrin ✓ **Correct answer**
- D. Botulism

A. Wrong: ciguatoxins are marine toxins from dinoflagellates, not plant products.

B. Wrong: brevetoxins are marine neurotoxins, not plant products.

yrethrin is the only natural plant-derived product among the options (from chrysanthemum flowers). The stem's word "herbicide" is as printed — pyrethrin is in fact an insecticide — but C is the only possible key.

D. Wrong: botulism is a bacterial toxin (Clostridium botulinum), not a plant product.

Question 82 General Science

Fumes cause toxicity based on their particle size which is ____.

- A. < 1.0 um
- B. < 2.0 um
- C. < 0.05 – 1.0 um
- D. < 1.0 um

No answer is given for this question, and none is taught. DEFECTIVE — excluded (options A and D print identically, and option C is also correct)

A. Correct in substance: fume particles are below 1.0 µm.

B. Wrong: fume particles are smaller than 1.0 µm, not up to 2.0 µm.

C. Correct in substance: the standard range quoted for fume is 0.05–1.0 µm.

D. Correct in substance and identical to option A. Options A and D print identically and both describe the fume range correctly, and C is also a correct description — the question has no unique answer and is excluded as DEFECTIVE (decided by assistant under owner's 8 Nov delegation).

Question 83 General Science

Which equation most accurately approximates risk?

- A. R=T/E
- B. R=T×E ✓ **Correct answer**
- C. R=T/I(E)

A. Wrong: risk is not threat divided by exposure.

B. Correct: Risk = Threat × Exposure is the standard formula that most accurately approximates risk.

C. Wrong: this is not a standard risk formula.

D. Wrong: risk is not the reciprocal of probability.

Question 84 General Science

Heat that is used and stored when a substance changes state from a solid to liquid.

- A. Sensible heat
- B. Latent heat ✓ **Correct answer**
- C. Latent heat transfer
- D. Sensible heat transfer

A. Wrong: sensible heat changes the temperature of a substance without changing its state.

B. Correct: the heat absorbed or stored during a change of state at constant temperature (solid to liquid) is latent heat.

C. Wrong: "latent heat transfer" is not the name of the heat itself.

D. Wrong: sensible heat transfer changes temperature, not state.

Question 85 General Science

Changes in sea surface temperature is greatly affected by ____.

- A. El Nino/Southern oscillation ✓ **Correct answer**
- B. El Nino/Northern oscillation
- C. Thermohaline

A. Correct: changes in sea surface temperature are greatly affected by El Niño/Southern Oscillation, which warms or cools the tropical Pacific.

B. Wrong: there is no "El Niño/Northern oscillation"; the phenomenon is the Southern Oscillation.

C. Wrong: thermohaline circulation is driven by temperature and salinity differences; it is not the main driver of sea surface temperature change.

D. Wrong: the thermocline is a layer in which temperature changes rapidly with depth, not a cause of surface temperature change.

Question 86 General Science

Which transport mechanism relies only on a concentration gradient to enter the cell?

- A. Active transport
- B. Phagocytosis
- C. Pinocytosis
- D. Simple diffusion ✓ **Correct answer**

A. Wrong: active transport moves substances against their gradient using energy, not on a concentration gradient alone.

B. Wrong: phagocytosis is the bulk engulfing of particles, not gradient-only transport.

C. Wrong: pinocytosis is the bulk uptake of liquid, not gradient-only transport.

D. Correct: simple diffusion is the passive movement of molecules down their concentration gradient, relying on the gradient alone.

Question 87 General Science

Currently, nuclear power provides approximately ___ of the world's energy.

s than 1%

- B. About 7% ✓ **Correct answer**
- C. About one-third
- D. Nearly 75%

A. Wrong: nuclear provides far more than 1% of world energy.

B. Correct: judged by the exam year 2018, nuclear supplied about 10% of world electricity and about 5% of total primary energy — "About 7%" is the nearest of the four options (IEA).

C. Wrong: nuclear is nowhere near a third of world energy.

D. Wrong: nuclear is nowhere near three-quarters of world energy.

Question 88 General Science

The most dangerous electromagnetic radiation is ____.

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

A. Correct: gamma rays have the shortest wavelength and highest energy of the electromagnetic radiations listed, and are the most dangerous.

B. Wrong: beta particles are electrons emitted in radioactivity, not electromagnetic radiation, and are less penetrating than gamma rays.

C. Wrong: alpha particles are helium nuclei, not electromagnetic radiation, and are the least penetrating.

D. Wrong: a positron is an antiparticle, not electromagnetic radiation.

89 General Science

Percentage of reflected solar radiation is called ____.

- A. Sun constant
- B. Net radiation
- C. Albedo ✓ **Correct answer**
- D. None of these

A. Wrong: the solar constant is the amount of solar energy received per unit area, not the reflected proportion.

B. Wrong: net radiation is incoming minus outgoing radiation, not the reflected proportion.

C. Correct: albedo is the proportion of solar radiation reflected back into space.

D. Wrong: albedo is the correct term.

Question 90 General Science

The incoming radiation from sun is in the form of ____.

- A. Long wave
- B. Short wave ✓ **Correct answer**
- C. Both A and B
- D. None of these

A. Wrong: the sun's incoming radiation is short wave, not long wave (long wave is the Earth's outgoing terrestrial radiation).

B. Correct: solar radiation arrives as short-wave radiation (visible and near-infrared).

C. Wrong: the incoming radiation is short wave only, not both.

D. Wrong: short wave is the correct answer.

91 English

___ a pencil?

- A. Do Raza has
- B. Does Raza has
- C. Does Raza have ✓ **Correct answer**
- D. Do Raza have

A. Wrong: "do" does not agree with the singular subject "Raza", and "has" is wrong after an auxiliary.

B. Wrong: after "does", the verb must be "have", not "has".

C. Correct: "Does Raza have a pencil?" — singular auxiliary "does" with the base verb "have".

D. Wrong: the subject "Raza" is singular, so the auxiliary must be "does", not "do".

Question 92 English

He asked her ___ that teacher:

- A. That whether she knew
- B. That if she knew
- C. If knew she
- D. If she knew ✓ **Correct answer**

A. Wrong: "that whether" is not a correct indirect-question construction.

B. Wrong: "that if" is not correct in an indirect question.

C. Wrong: the word order is wrong; the subject must come before the verb.

D. Correct: "He asked her if she knew that teacher" is the correct indirect form of the question.

93 English

____ to study in the morning:

- A. Never I have time
- B. I never have time ✓ **Correct answer**
- C. I have never time
- D. I have time never

A. Wrong: the adverb "never" cannot come before the subject in a statement.

B. Correct: "I never have time to study in the morning" — the adverb goes between the subject and the verb.

C. Wrong: "never" cannot go between "have" and its object "time" in this way.

D. Wrong: "never" cannot come at the end of the sentence here.

Question 94 English

He ____ from his position more than three years ago:

- A. Resigned ✓ **Correct answer**
- B. Has resigned
- C. Resigns
- D. Was resign

A. Correct: "more than three years ago" marks a finished past event, so the simple past "resigned" is correct.

B. Wrong: the present perfect does not go with a definite past time marker like "three years ago".

C. Wrong: the present simple does not fit a past event three years ago.

D. Wrong: "was resign" is not a correct verb form (and the past continuous does not fit a completed resignation).

95 English

Before he came to Pakistan, he ____ in Iran:

- A. Was lived
- B. Has lived
- C. Had lived ✓ **Correct answer**
- D. Live

A. Wrong: "was lived" is not a correct form for this sentence.

B. Wrong: the present perfect does not fit a past context.

C. Correct: "Before he came to Pakistan, he had lived in Iran" — the past perfect marks the earlier of two past events.

D. Wrong: the present simple does not fit a past context.

Question 96 English

I am not very hungry, I ____ something to eat before I left the office:

- A. Have
- B. Had ✓ **Correct answer**
- C. Have had
- D. Am having

A. Wrong: "have" alone does not mark the earlier of two past events.

B. Correct: "I had something to eat before I left the office" — the past perfect "had" marks the earlier of two past events.

C. Wrong: the present perfect does not fit a past context.

D. Wrong: the present continuous does not fit a past event.

97 English

The boy said he ____ the movie:

- A. Had seen ✓ **Correct answer**
- B. Is seeing
- C. Has seen
- D. Had been seen

A. Correct: in reported speech after a past reporting verb, the past perfect "had seen" is the correct backshifted form.

B. Wrong: the present continuous does not fit reported speech in the past.

C. Wrong: the present perfect does not fit reported speech in the past.

D. Wrong: the passive "had been seen" changes the meaning (the boy saw the movie; he was not seen).

Question 98 English

He says he ____ chess every evening nowadays:

- A. Played
- B. Has played
- C. Plays ✓ **Correct answer**
- D. Was playing

A. Wrong: the past simple does not fit a present habitual action.

B. Wrong: the present perfect does not express a habitual action with "every evening".

C. Correct: the reporting verb "says" is present, and "every evening" is a habitual action, so the present simple "plays" is correct.

D. Wrong: the past continuous does not fit a present habitual action.

99 English

A long time ago, I ____ in London for three years:

- A. Had lived
- B. Have lived
- C. Will live
- D. Lived ✓ **Correct answer**

A. Wrong: the past perfect is not needed here; the simple past is the natural form for a finished past period.

B. Wrong: the present perfect does not go with "a long time ago".

C. Wrong: the future does not fit "a long time ago".

D. Correct: "A long time ago, I lived in London for three years" — the simple past fits a finished past period.

Question 100 English

I have been ____ with him for the last three years:

- A. Correspond
- B. Corresponded
- C. Corresponding ✓ **Correct answer**
- D. Correspondence

A. Wrong: "have been correspond" is not grammatical.

B. Wrong: "have been corresponded" is not grammatical for this meaning.

C. Correct: "I have been corresponding with him" — the present perfect continuous takes the -ing form.

D. Wrong: "correspondence" is a noun and cannot complete the verb phrase.

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