AIIMS Paramedical 2025 Question Paper with Solutions

Time Allowed :3 Hours	**Maximum Marks :**100	**Total questions :**60

General Instructions

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i) All questions are compulsory. Marks allotted to each question are indicated in the margin.

ii) Answers must be precise and to the point.

iii) In numerical questions, all steps of calculation should be shown clearly.

iv) Use of non-programmable scientific calculators is permitted.

v) Wherever necessary, write balanced chemical equations with proper symbols and units.

vi) Rough work should be done only in the space provided in the question paper.

CHEMISTRY

1. What is the correct unit for the rate constant in a first-order reaction?

(A) Moles per litre per second

(B) Per second

(C) Litre per mole per second

(D) Moles squared per litre squared per second

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2. If the rate constant is measured in per second, which reaction order does this indicate?

(A) Zero order

(B) First order

(C) Either zero or first order

(D) None of these

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3. Match each type of reduction to its reagent:

(A) Clemmensen Reduction $\rightarrow$ Zinc amalgam with hydrochloric acid

(B) Wolff-Kishner Reduction $\rightarrow$ Hydrazine and potassium hydroxide with heat

(C) Rosenmund Reduction $\rightarrow$ Hydrogen gas with palladium on barium sulfate

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4. For a proton and electron both with the same kinetic energy, what is the ratio of their de Broglie wavelengths?

(A) 1:1

(B) $\frac{m_e}{m_p}$

(C) $\sqrt{\frac{m_p}{m_e}}$

(D) $\frac{m_e}{m_p}$

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5. What is the spin magnetic moment of Cr(III) in Bohr Magnetons?

(A) 3.87 BM

(B) 2.83 BM

(C) 5.92 BM

(D) 4.90 BM

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6. Evaluate these statements about transition metals:

(A) Both statements are right, and second explains the first

(B) Both are accurate, but second does not explain the first

(C) First is false, second is true

(D) First is true, second is incorrect

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7. Which statement correctly contrasts Clemmensen and Wolff-Kishner reductions?

(A) Clemmensen uses base, Wolff-Kishner uses acid

(B) Both are done under acidic conditions

(C) Clemmensen is for compounds stable in acid and uses Zn-Hg/HCl; Wolff-Kishner is for those stable in base and uses hydrazine/KOH

(D) Both only reduce carboxylic acids

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8. What is the bond order for diatomic carbon according to molecular orbital theory?

(A) 1

(B) 2

(C) 3

(D) 4

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9. Which compound's common name is cumene?

(A) Isopropylbenzene

(B) Methylbenzene

(C) Ethylbenzene

(D) Propylbenzene

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10. Choose the correct ascending order of ionization energy for Zn, Cu, Ag:

(A) Ag ¡ Cu ¡ Zn

(B) Zn ¡ Cu ¡ Ag

(C) Cu ¡ Zn ¡ Ag

(D) Zn ¡ Ag ¡ Cu

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11. Rank elements Li, Be, B, C in increasing first ionization energy:

(A) Li ¡ B ¡ C ¡ Be

(B) Li ¡ C ¡ B ¡ Be

(C) Be ¡ C ¡ B ¡ Li

(D) Li ¡ Be ¡ B ¡ C

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12. When phenol is treated with NaOH, CO_2 (heat), and then acidified, what results?

(A) Benzoic acid

(B) Salicylic acid

(C) Benzene

(D) Anisole

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13. Highest oxidation numbers for chromium and manganese:

(A) +6, +6

(B) +6, +7

(C) +7, +6

(D) +5, +7

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14. Oxidation numbers of oxygen in H_2O_2 and H_2O:

(A) –1 and –2

(B) –2 and –1

(C) –2 and –2

(D) 0 and –2

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15. Which element releases electrons most easily (lowest ionization enthalpy)?

(A) Zinc

(B) Cadmium

(C) Mercury

(D) All equally likely

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16. Which ligand is stronger based on the spectrochemical series?

(A) Thiocyanate

(B) Cyanide

(C) Both equally strong

(D) Neither is strong

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17. Which metal reacts most with dilute acid to displace hydrogen?

(A) Zinc

(B) Copper

(C) Silver

(D) All react the same

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18. If a compound has octahedral geometry, what is the central atom's hybridization?

(A) sp^2

(B) dsp^2

(C) sp^3d^2

(D) sp^3d^3

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19. Match each complex to its geometry:

- $[Ni(CN)_4]^{2-} \rightarrow$ Square planar

- $[NiCl_4]^{2-} \rightarrow$ Tetrahedral

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20. Which acid is the strongest: HF, HCl, HBr, HI?

(A) HF

(B) HCl

(C) HBr

(D) HI

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21. Which aniline derivative is a commonly used dental local anaesthetic?

(A) Paracetamol

(B) Sulfanilamide

(C) Lidocaine

(D) Aniline hydrochloride

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22. Which of these separation technique pairs is correctly matched?

(A) Ortho and para nitrophenol: fractional distillation

(B) Crude oil/petroleum: steam distillation

(C) Cereal and amla: simple distillation

(D) Crude oil/petroleum: fractional distillation

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23. Pick the reaction that shows the Gattermann-Koch process:

(A) Benzene + methyl chloride $\rightarrow$ ethylbenzene ($AlCl_3$ catalyst)

(B) Benzene + CO + HCl $\rightarrow$ benzaldehyde ($AlCl_3$, CuCl catalysts)

(C) Benzene + bromine $\rightarrow$ bromobenzene ($FeBr_3$ catalyst)

(D) Benzene + acetyl chloride $\rightarrow$ acetophenone ($AlCl_3$ catalyst)

PHYSICS

Q24. What are the dimensional formula units for voltage?

Q25. What is the ratio of the de Broglie wavelengths for an electron and a proton if both have equal kinetic energy?

Q26. If current drops from 4 A to 0 A in 0.5 s, and voltage is 120 V, find the self-inductance.

Q27. Apply the mirror formula if focal length $f = l\,\mathbf{m}$ and object distance $u = 15\,\mathbf{m}$.

Q28. What is the Bohr radius of a hydrogen atom?

Q29. How can energy losses in a transformer be minimised?

Q30. Given $E(t) = 108t - 22$, how is velocity derived from the electric field?

Q31. For a microscope with objective $f_o = 1$ cm, eyepiece $f_e = 10$ cm, and image distance $v = 25$ cm, find total magnification.

Q32. If light intensity is known, how is non-reflecting momentum calculated?

Q33. What is the magnetic field at the centre of a current-carrying loop?

Q34. Given n turns, current I, permeability, and diameter, find magnetisation.

Q35. What is C_v for a monoatomic gas?

Q36. For $V = 120$ V, find the resonant current I_0.

Q37. At $T = 27^\circ C$, $V_i = 0.4$ L, $V_f = 0.8$ L, find isothermal work.

Q38. For mass 20 kg, torque $\tau = 5$ Nm, find angular acceleration α.

BIOLOGY

Q39. Which technique did Mendel use while experimenting on pea plants?

(a) Natural pollination

(b) Hybridisation

(c) Grafting

(d) Emasculation

Q40. What is the term for the beginning of the menstrual cycle?

Q41. Who first classified the plant kingdom?

(a) Carlous Linnaeus

(b) R.H. Whittaker

(c) Bentham Hooker

Q42. Platelets are formed at which site?

Q43. Adaptive radiation is an example of which type of evolution?

Q44. Select the incorrect statement:

(a) In geitonogamy, pollination occurs in different flowers.

(b) In Vallisneria, pollination takes place with the help of water.

(c) Autogamy involves pollination within the same flower.

Q45. Match the following pairs:

- Trichoderma – Citric Acid

- Polysporum – Statins

- Yeast – Cyclosporin A

- Monascus Purpureus – Ethanol
- Aspergillus Niger – Citric Acid

Q46. Filariasis is caused by?

Q47. Name the repressor of the lac operon.

Q48. When xylem is present at the same radius in a stem or root, what is this arrangement called?

(a) Radial
(b) Conjoint
(c) Open
(d) Close
