Bihar Board 12 Chemistry Set G 2024 Question Paper

Time Allowed :3 Hours 15 mins	**Maximum Marks :**70	**Total questions :**96

General Instructions

Instructions to the candidates:

1. **Candidate must enter his/her Question Booklet Serial No. (10 Digits) in the OMR Answer Sheet.**
2. Candidates are required to give their answers in their own words as far as practicable.
3. Figures in the right-hand margin indicate full marks.
4. An extra time of 15 minutes has been allotted for the candidates to read the questions carefully.
5. This question booklet is divided into two sections — **Section-A** and **Section-B**.

1. Which of the following is not a first order reaction?

(A) $CH_3COOCH_3 + H_2O \xrightarrow{H^+} CH_3COOH + CH_3OH$

(B) $CH_3COOC_2H_5 + NaOH \rightarrow CH_3COONa + C_2H_5OH$

(C) $2H_2O_2 \rightarrow 2H_2O + O_2$

(D) $2N_2O_5 \rightarrow 4NO_2 + O_2$

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2. The unit of rate constant of a second order reaction is

(A) mol^{-1} L sec^{-1}

(B) mol^{-1} L^{-1} sec^{-1}

(C) mol^{-1} L sec

(D) mol L sec^{-1}

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3. If the rate equation for a reaction is $\frac{dx}{dt} = k[H]^{1/2}[B]^{1/2}$, the order of the reaction is

(A) 2

(B) $\frac{1}{2}$

(C) $\frac{3}{2}$

(D) 1

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4. According to Freundlich adsorption isotherm

(A) $\frac{x}{m} = kp^{1/n}$

(B) $\frac{m}{x} = kp^{1/n}$

(C) $xm = kp^{1/n}$

(D) $\frac{x}{m} = \frac{k}{p^{1/n}}$

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5. Milk is

(A) fat dispersed in water

(B) water dispersed in fat

(C) water dispersed in oil

(D) fat dispersed in fat

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6. Which of the following is a lyophilic colloid?

(A) Milk

(B) Gum

(C) Fog

(D) Blood

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7. Which of the following catalysts is used in the manufacture of ammonia by Haber's process?

(A) Al_2O_3

(B) $Fe + Mo$

(C) CuO

(D) Pt

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8. With which of the following does acetic acid not form acyl chloride?

(A) PCl_5

(B) PCl_3

(C) $SOCl_2$

(D) Cl_2

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9. Acetamide is

(A) Acidic

(B) Alkaline

(C) Amphoteric

(D) Neutral

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10. $\mathbf{CH_3CH_2C\,NH_2}$ is a

(A) Primary amine

(B) Secondary amine

(C) Tertiary amine

(D) Quaternary salt

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11. Methylamine on heating with chloroform and alcoholic KOH gives

(A) CH_3OH

(B) CH_3CN

(C) CH_3CHO

(D) CH_3NC

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12. Which of the following is the most basic?

(A) $C_6H_5NH_2$

(B) $C_6H_5NH_2$ (another isomer)

(C) $C_2H_5NH_2$

(D) $C_2H_5NH_2$ (another isomer)

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13. The helical structure of protein is stabilized by which of the following?

(A) Ionic bond

(B) Covalent bond

(C) van der Waals forces

(D) Hydrogen bond

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14. Which of the following is a ketohexose?

(A) Glucose

(B) Fructose

(C) Sucrose

(D) Starch

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15. Which of the following types of crystal is diamond?

(A) Ionic crystal

(B) Covalent crystal

(C) Molecular crystal

(D) Metallic crystal

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16. The structure of NaCl crystal is

(A) Hexagonal close packing

(B) Face centred cubic

(C) Square planar

(D) Body centred cubic

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17. Which of the following is an amorphous solid ?

(A) Diamond

(B) Graphite

(C) Common salt

(D) Glass

18. An octahedral void is surrounded by how many spheres ?

(A) 6

(B) 4

(C) 8

(D) 12

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19. Which of the following modes of expressing concentration of solution does not depend upon temperature ?

(A) Molarity

(B) Normality

(C) Formality

(D) Molality

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20. Which of the following show positive deviation from Raoult's law?

(A) C_6H_6 and $C_6H_5CH_3$

(B) C_6H_6 and CCI_4

(C) $CHCl_3$ and C_2H_5OH

(D) $CHCl_3$ and CH_3COCH_3

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21. The osmotic pressure of a solution is represented by which of the following equations?

(A) $\pi = \frac{CR}{T}$

(B) $\pi = \frac{C}{R}$

(C) $\pi = \frac{CT}{R}$

(D) $\pi = \frac{RT}{C}$

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22. Which of the following is the molecular formula of Orthophosphoric acid?

(A) H_3PO_3

(B) H_3PO_4

(C) HPO_3

(D) $H_4P_2O_7$

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23. The structure of XeF is

(A) Tetrahedral

(B) Octahedral

(C) Square planar

(D) None of these

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24. Which of the following halogens does not exhibit a positive oxidation state?

(A) I

(B) Br

(C) Cl

(D) F

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25. Which of the following has the smallest bond angle?

(A) H_2O

(B) H_2S

(C) H_2Se

(D) H_2Te

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26. Which of the following has the maximum number of unpaired electrons?

(A) Mg^{2+}

(B) Ti^{3+}

(C) V^{3+}

(D) Fe^{3+}

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27. The maximum oxidation state of chromium is

(A) +2

(B) +3

(C) +4

(D) +6

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28. The number of unpaired electrons in Cu^{2+} ion (Z = 29) is

(A) 0

(B) 1

(C) 2

(D) 3

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29. A vitamin which plays a vital role in the coagulating property of blood is

(A) Vitamin A

(B) Vitamin D

(C) Vitamin E

(D) Vitamin K

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30. Chloramine-T is a/an

(A) Disinfectant

(B) Antiseptic

(C) Analgesic

(D) Antipyretic

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31. Hydrazine is a drug which is used in the treatment of which of the following?

(A) Malaria

(B) Typhoid

(C) Cholera

(D) Tuberculosis

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32. Which of the following is an alkaloid?

(A) Nicotine

(B) Atropine

(C) Cocaine

(D) All of these

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33. Which of the following is a natural rubber?

(A) Isoprene

(B) Nitrocellulose

(C) Polyethylene

(D) Bakelite

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34. A raw material used in making nylon is

(A) Ethylene

(B) Butadiene

(C) Adipic acid

(D) Isoprene

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35. $F_2C = CF_2$ is a monomer of which of the following?

(A) Teflon

(B) Glyptal

(C) Nylon-6

(D) Buna-S

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36. Isotonic solutions have the same

(A) Density

(B) Normality

(C) Strength

(D) Molar concentration

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37. An azeotropic mixture of HCl and H_2O boils at

(A) 48% HCl

(B) 36% HCl

(C) 22% HCl

(D) 20% HCl

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38. A charge of 96500 coulomb liberates ..... from the solution of CuSO.

(A) 63.5 gm copper

(B) 31.76 gm copper

(C) 96500 gm copper

(D) 100 gm copper

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39. The cell constant of a conductivity cell is

(A) $\frac{L}{A}$

(B) $\frac{A}{I}$

(C) $I \cdot A$

(D) $\frac{R}{A}$

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40. The electromotive force of the cell Zn|$ZnSO_4$||$CuSO_4$|Cu is 1.1 volts. Its cathode is

(A) Zn

(B) Cu

(C) $ZnSO_4$

(D) $CuSO_4$

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41. Who gave the theory of ionisation?

(A) Faraday

(B) Arrhenius

(C) Ostwald

(D) Rutherford

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42. The rate of reaction of a substance depends upon

(A) Atomic mass

(B) Equivalent mass

(C) Molecular mass

(D) Active mass

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43. Alkyl halides form ethers by reacting with which of the following?

(A) Dry Ag_2O

(B) Moist Ag_2O

(C) Dry ZnO

(D) Moist ZnO

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44. The IUPAC name of $CH_3CH = CH_2CHO$ is

(A) 2-Hydroxybutanal

(B) 3-Hydroxybutanal

(C) 2-Hydroxypropanal

(D) None of these

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45. Formalin is the commercial name of

(A) Formic acid

(B) Fluoroform

(C) 40% aqueous solution of methanal

(D) Paraformaldehyde

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46. An aldehyde on oxidation gives

(A) an alcohol

(B) a ketone

(C) an ether

(D) an acid

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47. Chloretone is formed when chloroform reacts with

(A) Formaldehyde

(B) Acetaldehyde

(C) Acetone

(D) Benzaldehyde

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48. The general molecular formula of saturated monocarboxylic acids is

(A) $C_nH_{2n+2}O_2$

(B) $C_nH_{2n}O$

(C) $C_nH_{2n+1}O_2$

(D) $C_nH_{2n+1}O_2$

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49. By which of the following formic acid and formaldehyde can be distinguished?

(A) Benedict solution

(B) Fehling solution

(C) Tollen's reagent

(D) Sodium bicarbonate

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50. Which of the following metals is generally found in free state?

(A) Cu

(B) Au

(C) Al

(D) Fe

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51. Which of the following statements is true?

(A) All ores are minerals

(B) All minerals are ores

(C) A mineral cannot be an ore

(D) An ore cannot be a mineral

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52. Electrometallurgical process is used for the extraction of which of the following metals?

(A) Iron

(B) Lead

(C) Silver

(D) Sodium

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53. An ore having two different metal atoms is

(A) Hematite

(B) Galena

(C) Magnetite

(D) Copper pyrite

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54. Which of the following elements has electronic configuration

$1s^2 2s^2 2p^6 3s^2 3p^6 3d^1 04s^2 4p^6 4d^1 05s^2 4d^1 05p^1$**?**

(A) Oxygen

(B) Hydrogen

(C) Nitrogen

(D) Fluorine

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55. Which of the following oxides of nitrogen is called laughing gas?

(A) Nitric oxide

(B) Nitrous oxide

(C) Dinitrogen trioxide

(D) Dinitrogen pentoxide

56. Which of the following has the highest bond energy?

(A) O - O

(B) S - S

(C) Se - Se

(D) Te - Te

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57. The oxidation state of Ni in Ni(CO)$_4$ is

(A) 0

(B) 1

(C) 2

(D) 4

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58. Which of the following has the highest molar electrical conductance in aqueous solution?

(A) [Pt(NH$_3$)$_6$]Cl$_4$

(B) [Pt(NH$_3$)$_5$Cl]Cl$_3$

(C) [Pt(NH$_3$)$_4$Cl$_2$]Cl$_2$

(D) [Pt(NH$_3$)$_3$Cl$_3$]Cl

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59. The IUPAC name of K_3[Fe(CN)$_6$] is

(A) Potassium ferrocyanide

(B) Potassium ferricyanide

(C) Potassium hexacyanoferrate (II)

(D) Potassium hexacyanoferrate (III)

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60. Vitamin B12 contains

(A) Cobalt

(B) Magnesium

(C) Iron

(D) Nickel

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61. The coordination number of Ni in $[Ni(C_2O_4)_3]^{2-}$ is

(A) 3

(B) 6

(C) 4

(D) 5

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62. The IUPAC name of $CH_3CH_2CH_2Cl$ is

(A) 1-chloro-2-methyl butane

(B) 1-chloroisopentane

(C) 1-chloro-3-methyl butane

(D) None of these

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63. $C_2H_5Br + NaOH \rightarrow C_2H_5OH + NaBr$ is an example of which of the following types of reaction?

(A) Electrophilic substitution

(B) Nucleophilic substitution

(C) Both (A) and (B)

(D) None of these

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64. Which of the following alkyl halides is hydrolyzed by S_N1 mechanism?

(A) CH_3CH_2CX

(B) CH_3CH_2X

(C) $CH_3CH_2CH_2X$

(D) CH_3CH_3CX

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65. Chloroform on reduction with Zn and water gives

(A) Acetylene

(B) Ethylene

(C) Methane

(D) Ethane

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66. When ethyl bromide is treated with dry silver oxide, then we get

(A) Diethyl ether

(B) Ethanal

(C) Ethane

(D) Ethene

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67. Lucas reagent is

(A) Anhydrous $CaCl_2$ and conc. HCl

(B) Anhydrous $ZnCl_2$ and conc. HCl

(C) Anhydrous $AlCl_3$ and conc. HCl

(D) Anhydrous $PdCl_2$ and conc. HCl

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68. Butan-2-ol is a

(A) Primary alcohol

(B) Secondary alcohol

(C) Tertiary alcohol

(D) Dihydric alcohol

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69. Which of the following is a tertiary alcohol?

(A) CH_3CH_2OH

(B) $CH_3C(OH)CH_3$

(C) CH_2OH

(D) $CH_3C(OH)CH_2CH_3$

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70. The IUPAC name of $CH_3CH_2CH_2OH$ is

(A) 2-methyl-1-propanal

(B) Isobutyl alcohol

(C) 2-methyl-1-butanol

(D) None of these

Section B

1. What are the main differences between physical adsorption and chemical adsorption?

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2. What is Brownian movement?

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3. Discuss electrochemical principle regarding rusting of iron.

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4. What is the effect of dilution on molar conductance?

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5. What is mole fraction?

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6. Write Raoult's law of relative lowering of vapour pressure.

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7. What are network solids? Give an example.

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8. What is Schottky defect? Explain with example.

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9. Why do transition elements form complex compounds?

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10. Explain effective atomic number (EAN).

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11. Write the names and formulae of two ores of iron.

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12. Why is cryolite ore used during the extraction of Al metal?

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13. Arrange F, Cl, Br, and I in the increasing order of electron affinities.

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14. Write the electronic configurations of Kr (Z = 36) and Xe (Z = 54).

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15. Discuss the utility of DNA fingerprinting.

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16. Give one example of each of the following:

(i) Synthetic polymer

(ii) Condensation polymer

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17. Which is Rosenmund reduction?

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18. How is a polypeptide bond formed?

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19. What is the carbyl amine reaction?

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20. Write the IUPAC names of the following compounds:

(i) CH_3CH_2OH

(ii) $CH_3CH_2CH_2OH$

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21. What do you understand by rate of a reaction? What factors affect the rate of a reaction? Discuss.

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22. What is soap? How does it act in the cleansing of clothes?

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23. Write the principle of manufacture of ammonia by Haber's process. How does it react with $CuSO_4$ solution?

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24. How would you distinguish among primary, secondary, and tertiary alcohols?

25. Explain the following with examples: (i) Aldol condensation (ii) Cannizzaro's reaction

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26. Write IUPAC names of the following compounds:

(i) CH-CH-COOH (ii) CH=COOH (iii) ClCH-COOH (iv) CH-CH=CH-COOH (v) CH-CO-CH-COOH
