Bihar Board Class 12 Chemistry Set I 2026

Question Paper

Conducted by the Bihar School Examination Board (BSEB)

Time Allowed: 3 hrs 15 min **Maximum Marks: 70**

General Instructions

(i) This question booklet is divided into two sections: **Section A** and **Section B**. The paper has **96 questions** (70 + 20 + 6) and carries **70 marks**.

(ii) In **Section A**, there are 70 objective type questions, out of which **any 35 questions** are to be answered, each carrying **1 mark**. If more than 35 questions are answered, only the first 35 answers are evaluated. The answers are marked on the OMR answer sheet.

(iii) In **Section B**, there are 20 short answer type questions, out of which **any 10 questions** are to be answered, each carrying **2 marks**.

(iv) Apart from these, Section B has 6 long answer type questions, out of which **any 3 questions** are to be answered, each carrying **5 marks**.

(v) Candidates must enter the 10-digit Question Booklet Serial No. on the OMR answer sheet and should give their answers in their own words as far as practicable.

(vi) Figures in the right-hand margin indicate full marks. 15 minutes of extra time have been allotted to read the questions carefully.

Section A: Objective Type Questions (any 35 to be answered, 1 mark each)

1. If the electronic configuration of a transition element in its +3 oxidation state is $[\mathrm{Ar}]3d^4$, then its atomic number would be [1 mark]

(A) 25

(B) 26

(C) 22

(D) 19

---

2. The most common oxidation state of lanthanide elements is [1 mark]

(A) +2

(B) +3

(C) +4

(D) 0

---

3. The oxidation state of Ni in $\mathrm{Ni(CO)_4}$ is [1 mark]

(A) +4

(B) +3

(C) +2

(D) 0

---

4. The number of ions in aqueous solution of $[\mathrm{Co(NH_3)_5Cl}]\mathrm{Cl_2}$ is [1 mark]

(A) 3

(B) 4

(C) 2

(D) 6

---

5. $[\mathrm{Co(NH_3)_5Br}]\mathrm{SO_4}$ and $[\mathrm{Co(NH_3)_5SO_4}]\mathrm{Br}$ are related to each other as [1 mark]

(A) Ionisation isomers

(B) Linkage isomers

(C) Co-ordination isomers

(D) Geometric isomers

---

6. Vitamin B12 contains [1 mark]

(A) Cobalt

(B) Magnesium

(C) Iron

(D) Nickel

---

7. When chloroform reacts with acetone then which of the following is formed ? [1 mark]

(A) Ethylene dichloride

(B) Mesitylene

(C) Chloretone

(D) Chloral

8. **The number of atoms present in a face centred cubic unit cell is** [1 mark]

(A) 2

(B) 3

(C) 4

(D) 12

9. **The packing fraction for body-centred cubic cell is** [1 mark]

(A) 0.42

(B) 0.53

(C) 0.68

(D) 0.82

10. **Which of the following is ferromagnetic substance ?** [1 mark]

(A) Fe

(B) Cu

(C) NaCl

(D) MnO

11. **Which of the following has Frenkel defect ?** [1 mark]

(A) Sodium chloride

(B) Graphite

(C) Silver chloride

(D) Diamond

12. **An aqueous solution of which of the following compounds shows abnormal osmotic pressure?** [1 mark]

(A) Urea

(B) Common salt

(C) Glucose

(D) Sucrose

13. **The elevation in boiling point produced by one molal solution of a solute in a solvent is called** [1 mark]

(A) Ebullioscopic constant

(B) Vapour pressure constant

(C) Cryoscopic constant

(D) None of these

14. Aqueous solution of which of the following will have lowest vapour pressure ? [1 mark]

(A) 0.1 M $BaCl_2$

(B) 0.1 M Urea

(C) 0.1 M Na_2SO_4

(D) 0.1 M Na_3PO_4

15. By which of the following processes, is methyl amine prepared ? [1 mark]

(A) Wurtz reaction

(B) Hoffmann Bromamide reaction

(C) Friedel-Crafts reaction

(D) Kolbe's reaction

16. Maltose on hydrolysis gives [1 mark]

(A) Glucose + Fructose

(B) Galactose + Glucose + Fructose

(C) Starch + Sucrose

(D) Two molecules of Glucose

17. Which of the following is not a macromolecule ? [1 mark]

(A) DNA

(B) Starch

(C) Palmitate

(D) Insulin

18. Which of the following is capable of forming Zwitter ion ? [1 mark]

(A) $H_2N - CH_2COOH$

(B) CH_3COOH

(C) $CH_3CH_2NH_2$

(D) CH_3NO_2

19. Which of the following is used as antioxidant ? [1 mark]

(A) Citric acid

(B) EDTA

(C) Sodium nitrite

(D) Sodium gluconate

20. Riboflavin is the chemical name of which of the following ? [1 mark]

(A) Vitamin B_1

(B) Vitamin B_2

(C) Vitamin B_6

(D) Vitamin B complex

21. Which of the following is used as tranquilizer ? [1 mark]

(A) Luminal

(B) Tofranil

(C) Mescaline

(D) Sulphadiazine

22. 34.2 g of sugar is present in 234.2 g of its aqueous solution. Then its molal concentration is [1 mark]

(A) 0.1

(B) 0.5

(C) 5.5

(D) 55.0

23. Which of the following equations represents the Faraday's first law of electrolysis ? [1 mark]

(A) $mz = c \cdot t$

(B) $m = c \cdot z \cdot t$

(C) $mc = z \cdot t$

(D) $c = m \cdot z \cdot t$

24. On increasing dilution, the specific conductance of an electrolyte [1 mark]

(A) increases

(B) decreases

(C) remains constant

(D) none of these

25. The standard electrode potentials of metals A, B, C and D are $-3.05\,\mathrm{V}$, $-1.66\,\mathrm{V}$, $-0.40\,\mathrm{V}$ and $+0.8\,\mathrm{V}$ respectively. Which of the following would have the highest reducing power? [1 mark]

(A) A

(B) B

(C) C

(D) D

26. Which of the following is a secondary cell ? [1 mark]

(A) Leclanche cell

(B) Lead storage battery

(C) Concentration cell

(D) All of these

27. Which of the following represents the effect of temperature on reaction rate ? [1 mark]

(A) Nernst's equation

(B) Gibbs-Helmholtz equation

(C) Arrhenius equation

(D) Van't Hoff equation

28. Which of the following is not a first order reaction ? [1 mark]

(A) $CH_3COOC_2H_5 + H_2O \xrightarrow{H^+} CH_3COOH + C_2H_5OH$

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

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

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

29. The general formula of ether is [1 mark]

(A) $C_nH_{2n}O$

(B) $C_nH_{2n+1}O$

(C) $C_nH_{2n+2}O$

(D) $C_nH_{2n}O_2$

30. Which of the following reagents reacts easily with both Acetaldehyde and Acetone ? [1 mark]

(A) Fehling solution

(B) Grignard reagent

(C) Schiff's reagent

(D) Tollen's regent

31. The IUPAC name of $CH_3CH_2COCH_2CH_3$ is [1 mark]

(A) Diethyl ketone

(B) 3-Pentanone

(C) 2-Pentanone

(D) Methyl propyl ketone

32. Which of the following gives Cannizzaro's reaction? [1 mark]

(A) CH_3CHO

(B) $HCHO$

(C) $HCOOH$

(D) CH_3COCH_3

33. Which of the following is tartaric acid ? [1 mark]

(A) $CH_3 - CH(OH) - COOH$

(B) $HOOC - CH_2 - CH_2 - COOH$

(C) $HOOC - CH(OH) - CH(OH) - COOH$

(D) $HO - C(CH_2COOH)_2 - COOH$

34. An organic compound on reaction with saturated solution of $NaHCO_3$ gives effervescence. Then the compound is [1 mark]

(A) Alkane

(B) Alkene

(C) Acetic acid

(D) Ethyl alcohol

35. Which of the following is Isopropyl amine ? [1 mark]

(A) $CH_3 - CH_2 - CH_2 - NH_2$

(B) $CH_3 - NH - C_2H_5$

(C) $CH_3 - CH(NH_2) - CH_3$

(D) $(CH_3)_2CH - CH_2 - NH_2$

36. The extensive use of P_4O_{10} is done as [1 mark]

(A) Reducing agent

(B) Preservative

(C) Oxidising agent

(D) Dehydrating agent

37. Which of the following oxides is the most acidic ? [1 mark]

(A) P_2O_5

(B) N_2O_5

(C) Sb_2O_5

(D) As_2O_5

38. Which of the following has the highest bond energy? [1 mark]

(A) O - O

(B) S - S

(C) Se - Se

(D) Te - Te

39. Sulphur molecule is [1 mark]

(A) Diatomic

(B) Tetratomic

(C) Triatomic

(D) Octatomic

40. Which of the following is the strongest base ? [1 mark]

(A) ClO_4^-

(B) ClO_3^-

(C) ClO_2^-

(D) ClO^-

41. Which of the following exhibits only one oxidation state other than zero ? [1 mark]

(A) Cl_2

(B) F_2

(C) I_2

(D) Br_2

42. Which of the following cannot act as a reducing agent ? [1 mark]

(A) NO_2

(B) SO_2

(C) ClO_2

(D) CO_2

43. Which one of the following substances acts as an emulsifier ? [1 mark]

(A) Common salt

(B) Urea

(C) Soap

(D) Oil

44. Which of the following is a biological catalyst ? [1 mark]

(A) Carbohydrate

(B) Enzyme

(C) Amino acid

(D) Nitrogenous base

45. Which of the following is a shape selective catalyst ? [1 mark]

(A) V_2O_5

(B) Cr_2O_3

(C) MnO_2

(D) ZSM-5

46. In thermite process, reducing agent is [1 mark]

(A) C

(B) Zn

(C) Na

(D) Al

47. **Which of the following metals is extracted by leaching the ore with dilute cyanide solution ?** [1 mark]

(A) Silver

(B) Titanium

(C) Vanadium

(D) Zinc

48. **The main constituent of bones is** [1 mark]

(A) $CaCO_3$

(B) $Ca_3(PO_4)_2$

(C) $CaSO_4$

(D) CaF_2

49. **Which of the following metals is not obtained by electrolysis?** [1 mark]

(A) Na

(B) Mg

(C) Al

(D) Fe

50. **For a reaction,** $aA + bB \rightarrow$ **products,** $\frac{-d[A]}{dt}$ **is equal to** [1 mark]

(A) $\frac{-d[B]}{dt}$

(B) $\frac{-b}{d}\frac{d[B]}{dt}$

(C) $\frac{-a}{b}\frac{d[B]}{dt}$

(D) $\frac{-b}{a}\frac{d[B]}{dt}$

51. **Radioactive decay is a** [1 mark]

(A) Zero order reaction

(B) First order reaction

(C) Second order reaction

(D) Third order reaction

52. **The volumes of gases** H_2, CH_4, CO_2 **and** NH_3 **adsorbed by 1 g of charcoal at 288 K are in the order** [1 mark]

(A) $H_2 > CH_4 > CO_2 > NH_3$

(B) $CH_4 > CO_2 > NH_3 > H_2$

(C) $CO_2 > NH_3 > H_2 > CH_4$

(D) $NH_3 > CO_2 > CH_4 > H_2$

53. **The correct expression for Langmuir's adsorption isotherm is** [1 mark]

(A) $\frac{x}{m} = \frac{1+aP}{b}$

(B) $\frac{x}{m} = \frac{aP}{1+bP}$

(C) $\frac{x}{m} = \frac{1+aP}{1+bP}$

(D) $\frac{x}{m} = \frac{1}{a} + \frac{bP}{a}$

54. **The size of colloidal particle is** [1 mark]

(A) 1 nm - 10 nm

(B) 10 nm - 100 nm

(C) 1 nm - 100 nm

(D) 10 nm - 1000 nm

55. **Smoke is a colloidal state in which** [1 mark]

(A) a gas is dispersed in solid

(B) a solid is dispersed in gas

(C) a gas is dispersed in gas

(D) a liquid is dispersed in gas

56. **Butter is an example of** [1 mark]

(A) Gel

(B) Emulsion

(C) Sol

(D) Foam

57. **Which of the following noble gases can most easily be liquefied ?** [1 mark]

(A) Ar

(B) Ne

(C) Xe

(D) Kr

58. **The peroxy acid of sulphur is** [1 mark]

(A) $H_2S_2O_7$

(B) $H_2S_2O_8$

(C) H_2SO_4

(D) H_2SO_3

59. **In which of the following processes is nitric acid manufactured from ammonia ?** [1 mark]

(A) Ostwald process

(B) Birkeland-Eyde process

(C) Laboratory process

(D) All of these

60. Which of the following gases cannot be collected over water ? [1 mark]

(A) H_2

(B) O_2

(C) CH_4

(D) SO_2

61. Which of the following is formed by the reaction of Hg with ozone ? [1 mark]

(A) HgO

(B) HgO_2

(C) Hg_2O

(D) None of these

62. The bleaching property of chlorine is due to [1 mark]

(A) Acidic property

(B) Oxidising property

(C) Reducing property

(D) Air polluting property

63. The outermost electronic configuration of inert gases is [1 mark]

(A) ns^2np^2

(B) ns^2np^4

(C) ns^2np^5

(D) ns^2np^6

64. In Wurtz reaction, the reduction of alkyl halide is carried with [1 mark]

(A) Zn/HCl

(B) HI

(C) Zn/Cu couple

(D) Na in presence of dry ether

65. Ethyl bromide on boiling with alcoholic caustic potash gives [1 mark]

(A) Ethyl alcohol

(B) Ethylene

(C) Acetylene

(D) Ethane

66. **The reaction,** $C_6H_5X + 2\,Na + RX \xrightarrow{\text{Dry ether}} C_6H_5R + 2\,NaX$**, is called** [1 mark]

(A) Wurtz reaction

(B) Wurtz-Fittig reaction

(C) Fittig reaction

(D) Frankland reaction

67. **Which of the following reagents reacts with ethyl amine to give ethyl alcohol ?** [1 mark]

(A) Br_2/KOH

(B) Acidified $KMnO_4$

(C) HNO_3

(D) HNO_2

68. **Which of the following is known as wood spirit ?** [1 mark]

(A) Methyl alcohol

(B) Ethyl alcohol

(C) Glycerol

(D) Glycol

69. **When vapours of an alcohol are passed over hot reduced copper, it gives an alkene. The alcohol is** [1 mark]

(A) Primary

(B) Secondary

(C) Tertiary

(D) None of these

70. **Phenol gives a compound of characteristic colouration with which among the following ?** [1 mark]

(A) Iodine solution

(B) Bromine water

(C) Aqueous $FeCl_3$ solution

(D) Ammonium hydroxide

Section B: Short Answer Type Questions (any 10 to be answered, 2 marks each)

SA-1. **What is metamerism ? Give example.** [2 marks]

SA-2. **What is called rectified spirit ?** [2 marks]

SA-3. **Why do transition elements form complex compounds?** [2 marks]

SA-4. **What are called interhalogen compounds ? Give examples.** [2 marks]

SA-5. **How would you obtain the following compounds from ethyl bromide?**
(a) Ethene
(b) Diethyl ether [2 marks]

SA-6. **Write IUPAC names of the following complex compounds:**
(a) $[Co(NH_3)_5Cl]Cl_2$
(b) $K_3[Fe(C_2O_4)_3]$ [2 marks]

SA-7. **Discuss the utility of DNA fingerprinting.** [2 marks]

SA-8. **Write structural formulae of the following :**
(a) 2-Aminoethanol
(b) N-Ethylethanamine [2 marks]

SA-9. **"Dioxygen is a gas whereas sulphur is solid at room temperature." Give reason.** [2 marks]

SA-10. **Give the structure and basicity of orthophosphoric acid.** [2 marks]

SA-11. **What is Pseudo first order reaction? Give example.** [2 marks]

SA-12. **What are the importances of salt bridge in an electrochemical cell?** [2 marks]

SA-13. **Write IUPAC names of the following:**
(a) Lactic acid
(b) Tartaric acid [2 marks]

SA-14. **What is Fehling's solution?** [2 marks]

SA-15. **What are the differences between Ideal solution and Non-ideal solution ?** [2 marks]

SA-16. **How many tetrahedral and octahedral voids are there in a closed packing of N spheres ?** [2 marks]

SA-17. **What is called artificial sweetener ? Give an example.** [2 marks]

SA-18. **What is Buna-N-rubber ?** [2 marks]

SA-19. **Differentiate between Roasting and Calcination.** [2 marks]

SA-20. **Write a short note on Brownian movement.** [2 marks]

Section B: Long Answer Type Questions (any 3 to be answered, 5 marks each)

LA-21. **How many types of crystals are there ? Explain them in brief.** [5 marks]

LA-22. **What do you understand by Primary and Secondary cells ? Mention giving one example of each.** [5 marks]

LA-23. **Explain extraction of copper from copper pyrite.** [5 marks]

LA-24. **What are halogens? Write their names and electronic configurations. Throw light on the tendency of halogen to form hydrides.** [5 marks]

LA-25. **What type of compound is an alcohol? How is monohydric alcohol classified?** [5 marks]

LA-26. **Write IUPAC names of the following structures :**
(a) $CH_3 - CH(CH_3) - CH_2 - CHO$
(b) $CH_3 - CH(OH) - CH_2 - CHO$
(c) $CH_3 - C(CH_3)_2 - CO - CH_3$
(d) $OHC - CHO$
(e) CCl_3CHO [5 marks]