

1. Use a small notebook (16 pages) to answer the following questions
2. Draw a table like the one below and in it record your choice letter for all questions (Question 1 to Question 45)

3. **Write properly**
4. **Unit where questions are extracted are indicated to help you navigate your content with precision**
5. **After you have completed filling in your choice in the table, start a new section below the table and explain your choice for each question (Minimum: 2 sentences, Maximum : 4 sentences)**

- 6. Failing to explain your choice will lead to loss of all marks**
- 7. Failing to respect instructions will lead to complete cancellation of your work**
- 8. Work which will not be submitted on first day of school will not be considered.**

A. Brass – Aircraft body
B. Bronze – Electrical wiring
C. Stainless steel – Surgical instruments
D. Duralumin – Water pipes

A. Iron B. Zinc C. Copper D. Sodium

7. The main reducing agent in the blast furnace is:

- A. Coke B. Limestone C. Carbon monoxide D. Air

8. Which ore is correctly paired with the metal obtained?

- A. Cassiterite – Iron B. Chalcopyrite – Copper C. Bauxite – Zinc D. Wolframite – Aluminium

9. Why is aluminium not extracted by carbon reduction?

- A. Aluminium oxide is unstable B. Aluminium is too dense
C. Carbon forms an alloy with aluminium D. Aluminium is too reactive

10. The main purpose of limestone in iron extraction is to:

- A. Increase temperature B. Act as a reducing agent
C. Remove acidic impurities D. Prevent oxidation of iron

UNIT 3: NPK as Components of Fertilizers

11. In an NPK fertilizer labelled 15-15-15, what does “P” represent?

- A. Elemental phosphorus B. Phosphoric acid C. Phosphorus(V) oxide D. Phosphate ion

12. Which nutrient mainly promotes strong root development?

- A. Nitrogen B. Potassium C. Magnesium D. Phosphorus

13. Which fertilizer type improves soil structure by adding humus?

- A. Urea B. Superphosphate C. Organic manure D. NPK fertilizer

14. Excessive use of chemical fertilizers may cause:

- A. Increased soil fertility B. Water pollution C. Poor crop yield only D. Improved soil texture

15. Which element is classified as a micronutrient?

- A. Calcium B. Sulphur C. Magnesium D. Zinc

UNIT 4: Benzene

16. The unusual stability of benzene is due to:

- A. Alternating single and double bonds B. High molecular mass
C. Resonance and delocalised π -electrons D. Presence of hydrogen bonds

17. Which reaction is typical of benzene?

- A. Addition B. Polymerisation C. Neutralisation D. Electrophilic substitution

18. Benzene does not decolourise bromine water because:

- A. It is saturated B. It reacts only with catalysts C. It is aromatic and stable D. It is insoluble

19. Which catalyst is used in benzene chlorination?

- A. H_2SO_4 B. AlCl_3 C. NaOH D. Zn

20. The molecular formula of benzene is:

- A. C_6H_{12} B. C_6H_6 C. C_6H_5OH D. C_6H_{10}

UNIT 5: Derivatives of Benzene

21. Which group directs substitution to the ortho- and para-positions?

- A. $-NO_2$ B. $-COOH$ C. $-NH_2$ D. $-CHO$

22. Phenol reacts with bromine water to produce:

- A. No reaction B. White precipitate C. Brown fumes D. Colourless gas

23. Which compound is used as a dye intermediate?

- A. Benzene B. Aniline C. Toluene D. Benzoic acid

24. Oxidation of toluene produces:

- A. Benzene B. Benzyl alcohol C. Benzaldehyde only D. Benzoic acid

25. The $-NO_2$ group is classified as:

- A. Activating and ortho-directing B. Activating and para-directing
C. Deactivating and ortho-directing D. Deactivating and meta-directing

UNIT 6: Polymers and Polymerization

26. Which process produces polymers by eliminating small molecules like water?

- A. Addition polymerization B. Copolymerization
C. Condensation polymerization D. Free radical reaction

27. Vulcanisation of rubber mainly improves:

- A. Density B. Electrical conductivity C. Solubility D. Elasticity and strength

28. Which polymer is a thermosetting plastic?

- A. Polyethene B. PVC C. Bakelite D. Nylon

29. Polymers that soften on heating are called:

- A. Elastomers B. Thermoplastics C. Thermosets D. Fibres

30. Which polymer is biodegradable?

- A. Polythene B. PVC C. Polystyrene D. Polyamide

UNIT 7: Solvent Extraction & Colligative Properties

31. Colligative properties depend on:

- A. Nature of solute B. Molecular mass C. Number of solute particles D. Chemical formula

32. Which property explains boiling point elevation?

- A. Strong bonding B. Vapour pressure lowering C. Chemical reaction D. Increased volume

33. Which law governs solvent extraction?

- A. Boyle's law B. Raoult's law C. Hess's law D. Nernst distribution law

34. Osmosis involves movement of:

- A. Solute through membrane B. Solvent from dilute to concentrated solution
C. Solvent from concentrated to dilute solution D. Gas molecules only

35. Freezing point depression is used to determine:

- A. Density B. Volume C. Molar mass D. Colour

UNIT 8: Quantitative Chemical Equilibrium

36. The equilibrium constant K_c depends on:

- A. Pressure only B. Initial concentrations C. Catalyst D. Temperature

37. When $Q_c < K_c$, the reaction will:

- A. Be at equilibrium B. Shift to the left C. Shift to the right D. Stop

38. Which expression relates K_p and K_c ?

- A. $K_p = K_c + RT$ B. $K_p = K_c(RT)^n$ C. $K_p = K_c \div RT$ D. $K_p = K_c - RT$

39. A catalyst affects equilibrium by:

- A. Changing K_c B. Shifting equilibrium position
C. Increasing reaction speed only D. Changing ΔH

40. Which species is excluded from K_c expression?

- A. Gases B. Aqueous ions C. Pure liquids D. Solutions

UNIT 9: pH of Acidic and Alkaline Solutions

41. pH is defined as:

- A. $\log[H^+]$ B. $-\log[H^+]$ C. $\log[OH^-]$ D. $-\log[OH^-]$

42. A solution with pH 3 is:

- A. Neutral B. Weakly basic C. Strongly acidic D. Weakly acidic

43. Which relationship is correct at 25 °C?

- A. $pH \times pOH = 14$ B. $pH + pOH = 7$ C. $pH - pOH = 14$ D. $pH + pOH = 14$

44. A buffer solution resists changes in:

- A. The pH B. Concentration C. Pressure D. pH

45. Which salt forms an acidic solution?

- A. NaCl B. KNO_3 C. NH_4Cl D. Na_2CO_3