

Bhavan's Tripura Vidyamandir1st Quarterly Test : (2025-2026)**Class: - 12**

Time: - 2 Hours

Subject:-Chemistry

Total: - 50 Marks

Name of the student:

Roll

Section

General instructions

- There are 25 questions in this question paper with internal choice.
- SECTION A consists of 10 multiple choice questions carrying 1 mark each.
- SECTION B consists of 8 very short answer questions carrying 2 marks each.
- SECTION C consists of 5 short answer questions carrying 3 marks each.
- SECTION D consists of 1 question carrying 5 marks.
- SECTION E consists of 1 case study question carrying 4 marks.
- All questions are compulsory.

SECTION A

- Low concentration of oxygen in the blood and tissues of people living at high altitude is due to
 - High atmospheric pressure
 - Low temperature
 - Low atmospheric pressure
 - Both low temperature and high atmospheric pressure.
- Which of the following pairs will form an ideal solution?
 - Chloroform and acetone
 - Ethanol and acetone
 - n- hexane and n-heptane
 - phenol and aniline
- The colligative property used for the determination of molar mass of polymers and protein is
 - osmotic pressure
 - depression in freezing point
 - relative lowering in vapour pressure
 - elevation in boiling point.
- ΔG and E^0_{cell} for a spontaneous reaction will be
 - positive, negative
 - negative, negative
 - negative, positive
 - positive, positive
- The unit of molar conductivity is
 - $\text{Scm}^{-2}\text{mol}^{-1}$
 - $\text{Scm}^2\text{mol}^{-1}$
 - $\text{S}^{-1}\text{cm}^2\text{mol}^{-1}$
 - Scm^2mol
- Which of the following cell was used in Apollo space programme?
 - Mercury cell
 - Daniell cell
 - $\text{H}_2\text{-O}_2$ cell
 - Dry cell
- Out of the following transition elements the maximum number of oxidation states are shown by
 - Sc
 - Cr
 - Mn
 - Fe
- Which does not form amalgam?
 - Fe
 - Co
 - Ag
 - Zn

Directions: These questions consist of two statements, each printed as Assertion and Reason. While answering these questions, you are required to choose any one of the following four responses.

- If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
- If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.

- (c) If the Assertion is correct but Reason is incorrect.
(d) If both the Assertion and Reason are incorrect.

9. Assertion: molarity of a solution changes with temperature

Reason: molarity is a colligative property.

10. Assertion: conductivity of all electrolytes decreases on dilution.

Reason: on dilution number of ions per unit volume decreases.

SECTION B

11. Give two examples each of a solution:

- Showing positive deviation from Raoult's law
- Showing negative deviation from Raoult's law.

12. What is meant by abnormal molecular mass? Explain it with suitable example.

13. Define molar conductivity and write its SI unit.

14. If a current of 0.5 ampere flows through a metallic wire for 2 hours, then how many electrons would flow through the wire?

15. What are transition elements? Write two properties. (1+1)

16. Give reason for the following: (1+1)

- Transition metals form alloy.
- Mn_2O_3 is basic whereas Mn_2O_7 is acidic.

17. For a 5% solution of urea (molar mass=60g/mol) calculate the osmotic pressure at 300K. ($R=0.0821 \text{ L atm K}^{-1} \text{ mol}^{-1}$)

18. For the Galvanic cell write (0.5+0.5+1)

- Oxidation half reaction
- Reduction half reaction
- Complete cell reaction.

SECTION C

19. a. What type of deviation is shown by a mixture of ethanol and acetone? Give reason.

b. Calculate molality of 2.5g of ethanoic acid in 75g benzene.

c. Write the equation for depression in boiling point.

20. How much electricity in terms of faraday is required to produce? (1.5+1.5)

- 20g of Ca from molten CaCl_2
- 40g of Al from molten Al_2O_3 .

21. Name the catalyst used in the

- Manufacture of ammonia by Haber's process.
- Oxidation of ethyne to ethanol
- Photographic industry.

22. State and explain Henry's law. Write one application of it. (2+1)

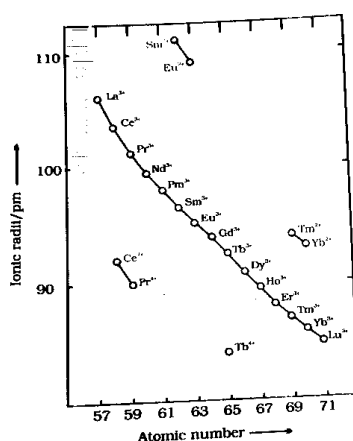
23. Define the following term and write their unit.

- Resistance
- Resistivity
- Specific conductance

SECTION D

24. Read the passage carefully and answer the questions that follow:

The f-block consists of the two series, lanthanoids (the fourteen elements following lanthanum) and actinoids (the fourteen elements following actinium). Because lanthanum closely resembles the lanthanoids. The chemistry of the actinoids is much more complicated. The complication arises partly owing to the occurrence of a wide range of oxidation states in these elements and partly because their radioactivity creates special problems in their study. The overall decrease in atomic and ionic radii from lanthanum to lutetium (the lanthanoid contraction) is a unique feature in the chemistry of the lanthanoids. In the lanthanoids, La (II) and Ln (III) compounds are predominant species



- Which metal in the first transition series (3d series) exhibits +1 oxidation state most frequently and why?
- The transition metal (with the exception of Zn, Cd and Hg) is hard and has high melting and boiling points. Give reason.
- Both O_2 and F_2 stabilize high oxidation states of transition metals but the ability of oxygen to do so exceeds that of fluorine. Give reason. (2+2+1)

OR

The atomic radii of the metals of the third (5d) series of transition elements are virtually the same as those of the corresponding members of the second (4d) series. Give reason.

(2+2)

SECTION E

25. a. what is meant by disproportionation of an oxidation state. Give one example.
b. Explain why europium (II) is more stable than Ce (II)?

OR

- Measurement of osmotic pressure method is preferred for the determination of molar mass of macromolecules such as proteins and polymers. Explain
- Why aquatic animals are more comfortable in cold water in warm water?
- What type of deviation is shown by a mixture of ethanol and acetone? (1+1+2)