

JIYA LAL MITTAL DAV PUBLIC SCHOOL

GRADE – XII SA-I (SEPT, 2015)

SUBJECT – CHEMISTRY

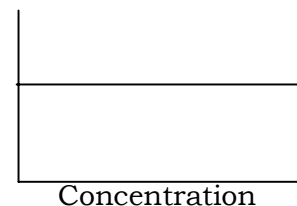
TIME: 3hrs.

M.M-70

General Instructions:

1. All questions are compulsory.
2. Questions 1 to 5 are very short answer questions and carry 1 mark each.
3. Questions 6 to 10 are short answer questions and carry 2 marks each.
4. Questions 11 to 22 are also short answer questions and carry 3 marks each.
5. Questions 23 is value based question and carry 4 marks.
6. Questions 24 to 26 are long answer questions and carry 5 marks each.

- 1) What is the formula of a compound in which an element Y forms hcp lattice and X occupy $2/3^{\text{rd}}$ of tetrahedral voids?
- 2) What is a copolymer?
- 3) Define doping.
- 4) Write two characteristics of an ideal solution.
- 5) What does the negative value of E°_{cell} indicate?
- 6) For a chemical reaction variation in rate with concentration is given below:
 - (a) What is order of reaction?
 - (b) What are the units of rate constant for this reaction.



- 7) 18g of Glucose (M.M = 180g mol^{-1}) is dissolved in 1kg of water in sauce pan. At what temperature will tails solution boil? (K_b for water = 0.52K Kg mol^{-1} , b.pt. of pure water = 373.15K)
- 8) Define thermoplastic and thermosetting polymers. Give two examples of each.
- 9) How does chemisorption varies with temperature? Explain it.

- 10) What is meant by coordination number? What is the coordination number of atoms in a:
(a) Cubic close packed structure.
(b) body centred cubic structure.

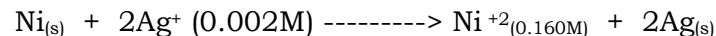
Or

What makes a glass different from a solid such as quartz?
Under what conditions could quartz be converted into glass?

- 11) What type of substances would make better permanent magnets, ferromagnetic or ferrimagnetic? Justify your answer.
- 12) Calculate the temperature at which a solution containing 54g of glucose in 250g of water will freeze. (k_f for water = 1.86 K Kg mol⁻¹)
- 13) Define conductivity, molar conductivity. How do they vary with change in concentration ?

Or

Calculate emf of cell in which the following reaction takes place:



Given that $E_{\text{cell}} = 1.05\text{V}$.

- 14) A first order reaction is 20% complete in 10 minutes. Calculate the time taken for 75% completion of reaction.
- 15) Give difference between physisorption and chemisorptions.
- 16) Define: Aerosol, Emulsion, Electrophoresis.
- 17) (i) Explain why $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$ is coloured while $[\text{Sc}(\text{H}_2\text{O})_6]^{3+}$ is colourless.
(ii) What is coordination number of Fe in $[\text{Fe}(\text{EDTA})]^-$?
- 18) (i) What is vulcanization? What is its importance?
(ii) Give monomer units of Nylon-6, 6.
- 19) (i) Name a substance which can be used as an antiseptic as well as disinfectants.
(ii) Give constituents of Dettol.
(iii) Why Aspirin can be used to prevent heart attack although it is an antipyretic?

- 20) (i) How do antihistamines act on the body?
(ii) What is medicinal use of narcotic drugs?
- 21) Write collision theory of chemical reactions.

22) Calculate packing efficiency in body centered cubic unit cell.

23) Raman went to a hospital with his father to see his uncle who was admitted there because of some health problems. The doctor asked Raman to bring a particular injection to be given to his uncle. When Raman brought the injection, the doctor asked him to get the injection changed from the chemist. Raman insisted that it was the same injection as prescribed by him and its expiry date is also next year. But the doctor explained Raman that the injection has not been expired but it was not of compatible concentration as prescribed by him. Raman felt satisfied and got the injection changed.

- (a) What was the reason for asking Raman to get the injection of compatible concentration?
(b) What human values are associated with the doctor's action?

24) A solution of $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$ is green but a solution of $[\text{Ni}(\text{CN})_4]^{2-}$ is colourless. Explain.

OR

Using IUPAC Norms, write formulas for following:

- (a) Pentaamminenitrito-N-cobalt (III)
(b) Hexaammine cobalt (III) sulphate.
(c) Potassium trioxalatochromate (III)
(d) Tetraamminedichloridocobalt (III) ion.
(e) Tetraamineaquachlorido cobalt (III) chloride.

- 25) (i) Why four uses of emulsions?
(ii) Why sky appears blue?
(iii) Why is adsorption always exothermic

OR

Explain:

- (a) Cottrell's smoke precipitator is fitted at the mouth of the chimney used in factories.
(b) Physical adsorption is multilayered while chemical adsorption is monolayered.
(c) Delta formation when river and sea water intermix.

26) The conductivity of $0.001028 \text{ mol L}^{-1}$ acetic acid is $4.95 \times 10^{-5} \text{ S cm}^{-1}$. Calculate its dissociation constant if Λ^∞ for acetic acid is $390.5 \text{ Scm}^2\text{mol}^{-1}$.

OR

Calculate standard free energy change and maximum work obtained for the reaction occurring in cell:

$\text{Zn}_{(s)}$

Also calculate equilibrium constant for the reaction.