

**2017
CHEMISTRY**

Total marks : 70

Time : 3 hours

General instructions:

- i) Approximately 15 minutes is allotted to read the question paper and revise the answers.
 - ii) The question paper consists of 30 questions. All questions are compulsory.
 - iii) Marks are indicated against each question.
 - iv) Internal choice has been provided in some questions.
- N.B:** Check that all pages of the question paper is complete as indicated on the top left side.

1. The presence of F-centres in a crystal makes it 1
(a) conducting (b) non-conducting
(c) coloured (d) colourless.
2. The solubility of a gases in liquids increases with increase of 1
(a) temperature (b) pressure
(c) volume (d) density.
3. The primary cells are 1
(a) rechargeable (b) non- rechargeable
(c) everlasting (d) short lasting.
4. The IUPAC name of $K[Ag(CN)_2]$ is 1
(a) dicyanosilver (I) (b) dicyanoargentate (I)
(c) potassium dicyanoargentate (I) (d) potassium dicyano argentate (II)
5. Phenols on reaction with conc. HNO_3 in the presence of conc. H_2SO_4 gives 1
(a) o-nitrophenol (b) m-nitrophenol
(c) p-nitrophenol (d) 2,4,6-trinitrophenol.
6. Define vant- Hoff's factor. 1
7. Define order of a reaction. 1
8. What is meant by selectivity of a catalyst? 1

9. What is the IUPAC name of $\text{CH}_3\text{CH}_2\underset{\text{Cl}}{\text{CH}}\text{CHO}$? 1
10. What are hormones? 1
11. a. Why are zinc, cadmium and mercury normally not considered as transition elements? 2
Or
 b. Why do transition elements act as good catalyst?
12. a. On the basis of VBT, predict the shape and magnetic behaviour of $[\text{Fe}(\text{CN})_6]^{4-}$. 2
Or
 b. What is an ambidentate ligand? Give an example.
13. Why are haloarenes less reactive than haloalkanes towards nucleophilic substitution reaction? 2
14. (i) What is DDT?
 (ii) Complete the reaction: $\text{CH}_3\text{CH}_2\text{OH} + \text{SOCl}_2 \xrightarrow{\text{pyridine}} ? + ? + ?$ 1+1=2
15. Why are aliphatic amines stronger base than the aromatic amines? 2
16. a. What is carbylamine reaction? Give the reaction. 2
Or
 b. Give one test to distinguish primary, secondary and tertiary amines from each other.
17. An element having a face-centred cubic unit cell has a molar mass 60g mol^{-1} and a cell edge of 400pm . What is its density? [$N_A = 6.022 \times 10^{23}\text{ mol}^{-1}$]. 3
18. a. Calculate the amount of sodium chloride (electrolyte) which must be added to one kilogram of water so that the freezing point is depressed by 3K . Given K_f for water = 1.86K kg mol^{-1} . 3
Or
 b. A solution containing 4.2g of an organic compound in 50g of acetone shows an elevation of boiling point by 1.8K . Determine the molar mass of the organic compound. K_b of acetone = 1.71K kg mol^{-1} .

19. Derive an expression for integrated rate equation for first order reaction. 3
20. Give three points of differences between lyophobic and lyophilic sols. 3
21. a. What is meant by leaching? Give one example to illustrate the use of leaching in metallurgical process. 3
Or
b. Explain with suitable diagram the production of blistered copper from copper matte by Bessemerization. 3
22. How is nitric acid prepared by Ostwald's process? Give the reactions involved in it. 3
23. How is potassium dichromate prepared from chromite ore? 3
24. How do primary, secondary and tertiary alcohols differ towards oxidation reaction? 3
25. a. Explain the term:
(i) Zwitter ion
(ii) Oligosaccharides
Or 3
b. What are the different types of RNA found in the cells of an organism? State the functions of each type.
26. a. How can Buna-S be prepared? Give one use of it. 3
Or
b. What is LDPE and HDPE?
27. What are analgesics and tranquilizers? Give one example each. 3
28. a. (i) State Kohlrausch's law and give one of its application.
(ii) Calculate the molar conductivity at infinite dilution (Λ_m^∞) for CH_3COOH from the following data:
 Λ_m^∞ for HCl , CH_3COONa and NaCl at infinite dilution are 426.1, 91.0 and $126.5 \text{ Scm}^2\text{mol}^{-1}$.
Or 5
b. (i) State Faraday first law of electrolysis.
(ii) What is corrosion? Calculate the electrode potential of $\text{Mg}^{2+}/\text{Mg(s)}$ electrode at 25°C in which concentration of Mg^{2+} ion is 0.1M. ($E^\circ \text{Mg}^{2+}/\text{Mg} = -2.36\text{V}$, $R = 8.31 \text{ JK}^{-1}\text{mol}^{-1}$, $F = 96500 \text{ Cmol}^{-1}$).

29. **a.** (i) Give the comparative account of thermal stability of hydrides of Group 16 element.
(ii) Write the preparation of ammonia by Haber's process. What are the reaction conditions involved in it?
- Or** **5**
- b.** (i) What are Inter- halogen compounds? How are they classified?
(ii) Draw the structure of ClF_3 , BrF_5 and IF_7 and mention the type of hybridization and geometry in each case.
30. **a.** (i) Why are aldehydes more reactive than ketones towards nucleophilic addition reaction?
(ii) Give the reaction involved in -
A) Cannizzaro reaction
B) Clemmensen reduction.
- Or** **5**
- b.** (i) What is Fehling's solution test?
(ii) Give the reaction of Grignard reagent with aldehyde and ketone.
