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 $CH_3CH_2\underset{\displaystyle Cl}{\underset{|}{C}}HCHO$? **1**

10. What are hormones? **1**

11. **a.** Why are zinc, cadmium and mercury normally not considered as transition elements?

Or **2**

b. Why do transition elements acts as good catalyst?

12. **a.** On the basis of VBT, predict the shape and magnetic behaviour of $[Fe(CN)_6]^{4-}$.

Or **2**

b. What is an ambidendate 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: **1+1=2**

$$CH_3CH_2OH + SOCl_2 \xrightarrow{\text{pyridine}} ? + ? + ?$$

15. Why are aliphatic amines stronger base than the aromatic amines? **2**

16. **a.** What is carbylamine reaction? Give the reaction.

Or **2**

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 $60gmol^{-1}$ and a cell edge of 400pm. What is its density? [$N_A = 6.022 \times 10^{23} mol^{-1}$]. **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=$1.86Kkg\ mol^{-1}$.

Or **3**

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 = $1.71Kkgmol^{-1}$.

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.

Or **3**

b. Explain with suitable diagram the production of blistered copper from copper matte by Bessemerization.

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.

Or **3**

b. What is LDPE and HDPE?

27. What are analgesics and tranquilizers? Give one example each. **3**

28. **a.** (i) State Kohlrauch'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 HC*l*, CH_3COONa and NaC*l* at infinite dilution are 426.1, 91.0 and126.5 Scm^2mol^{-1}.

Or **5**

b. (i) State Faraday first law of electrolysis.
(ii) What is corrosion? Calculate the electrode potential of $Mg^{2+}/Mg(s)$ electrode at 25°C in which concentration of Mg^{2+} ion is 0.1M.
($E^\circ Mg^{2+}/Mg = -2.36V$, $R = 8.31\ JK^{-1}mol^{-1}$, $F = 96500Cmol^{-1}$).

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 nucleophillic 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.

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