

Half-Yearly Examination - 2018

CHEMISTRY

Time : 2.30 hrs.

Max. Marks : 70

Instructions : 1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately. 2) Use Blue or Black Ink to write and underline and pencil to draw diagrams.

SECTION - I

Note : i) All all the questions. ii) Choose the most suitable answer from the given four alternatives and write the option code and the corresponding answer. 15 x 1 = 15

1. Which of the following particle having same kinetic energy, would have the maximum de-Broglie wavelength?
a) α - particle b) proton c) β - particle d) neutron
2. Phosphine is.....of phosphorus.
a) hydride b) oxide c) nitride d) halide
3. In the presence of dilue acids $K_2Cr_2O_7$, oxidises H_2S to S, the oxidation state of sulphur changes from
a) -2 to +2 b) -1 to -1 c) -2 to 0 d) -1 to 0
4. In aqueous solutions and in their solid compounds of Lanthanides, the most common oxidation state is.....a) +4 b) +3 c) +5 d) +6
5. Select the correct statements :
Statement - I : All electron pair acceptors are Lewi's acids
Statement - II : All electron pair donors are Lewi's bases
Statement : III : NH_3 is a Lewi's acid
Statement : IV : H_2O is a Lewi's base
a) I, II and III b) II, III and IV c) I, III and IV d) I, II and IV
6. In a Fcc lattice of A and B type atoms are present. A atoms are present at the corners while B type are at face centres. If in each unit cell, two of the A type are missing from the corner, what is the simplest formula of the compound?
a) A_1B_4 b) A_7B_{24} c) A_7B_{20} d) A_6B_7
7. The unit of pseudo first order reaction is :
a) sec^{-1} b) $lit. mol^{-1} sec^{-1}$ c) $mol. litre^{-1}$ d) $lit^2 sec^{-1}$
8. Haze is a colloidal solution of :
a) solid dispersed in gas b) gas dispersed in liquid c) gas dispersed in gas d) solid dispersed in liquid
9. For the titration between oxalic acid and sodium hydroxide, the indicator used in.....
a) potassium permanganate b) Phenolphthalein c) litmus d) methylorange
10. The relationship between the equilibrium constant and standard emf of a cell is :
a) $E^0 = 0.0591 \log k$ b) $0.0591E^0 = \log k$ c) $nE^0 = 0.0951 \log k$ d) $nE^0 = 0.0591 \log k$
11. Identify chiral molecule among the following :
a) Isopropyl alcohol b) Isobutyl alcohol c) 2-pentanol d) 1-bromo - 3 - butene
12. Isomerism exhibited by diols :
a) functional isomerism b) matamerism c) tautomerism d) all the above
13. Match :
a) Rosenmund's reduction i) anhydrous $AlCl_3$
b) Stephen's reaction ii) $Pd/BaSO_4$
c) Benzoin condensation iii) $SnCl_2/HCl$
d) Friedel crafts reaction iv) alcoholic KCN
a) (i), (iii), (ii), (iv) b) (iii), (iv), (ii), (i) c) (iv), (ii), (i), (iii) d) (ii), (iii), (iv), (i)
14. Which order of arrangement is correct in terms of the strength of the acid?
a) $CH_3CH_2COOH > CH_3COOH < HCOOH < ClCH_2COOH$
b) $ClCH_2COOH < HCOOH < CH_3COOH < CH_3CH_2COOH$
c) $CH_3CH_2COOH < CH_3COOH < HCOOH < ClCH_2COOH$
d) $HCOOH > CH_3CH_2COOH < CH_3COOH > ClCH_2COOH$
15. Raffinose is an example of.....sacchride. a) mono b) di c) tri d) poly

SECTION - II

Answer any six questions and question number 18 is compulsory.

6 x 2 = 12

16. Electron affinity of fluorine is less than that of chlorine - why?
17. Mention the following in the Co-ordination Compound $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{NO}_2$.
a) ligand b) central metal ion c) co-ordination number d) nature of the complex
18. Complete the following nuclear reactions ; a) ${}^7_3\text{N}^{15}$ (p, α) b) ${}_{11}\text{Na}^{23}$ (n, β)
19. State Le-chatelier's Principle.
20. Identify lyophilic and lyophobic colloids formed by the following with cold/hot water :
a) gelatin b) sulphur c) protein d) starch
21. Define standard emf of a cell.
22. Arrange the following in increasing order of reactivity towards nucleophilic addition -
 HCHO , CH_3CHO and CH_3COCH_3
23. How a cyclic ester is obtained from the acid which is present in milk?
24. Write about phospholipids.

SECTION - III

Answer any six questions and question number 27 is compulsory.

6 x 3 = 18

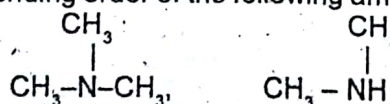
25. Lead pipes are not used in supplying drinking water. Why?
26. Write any three uses of lanthanides.
27. Mention and explain the isomerism exhibited by $[\text{Co}(\text{NH}_3)_5\text{Br}]\text{SO}_4$ and $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Br}$.
28. Draw the neat sketches of SC, BCC, FCC and mention the number of atoms per unit cell in each of them.
29. Give the type of complex reactions for the following :
a) bromination of bromobenzene b) decomposition of Hydrogen Iodide in gaseous phase
c) hydrolysis of diester in the presence of base
30. Write any three general characteristics of catalytic reactions.
31. Draw the structure of Maleic and fumaric acid and explain their stability. *CTEN*
32. Write IUPAC names for the following :
a) $\text{C}_7\text{H}_5\text{CHO}$ b) $\text{C}_6\text{H}_5\text{CH}=\text{CH}-\text{CHO}$ c) $\text{CH}_3-\overset{\text{O}}{\underset{\text{O}}{\parallel}}\text{C}-\text{CH}_2-\text{CH}=\text{CH}_2$
33. Give the tests to identify carboxylic acids.

SECTION - IV

Answer all the questions.

5 x 5 = 25

34. a) i) Where the types of H - bonding with one example each. 2
ii) Explain the molecular orbital diagram of N_2 molecule. (OR) 3
- b) i) How ionic radii varies along the group and period. 2
ii) Calculate the effective nuclear charge experienced by the 4s electron in potassium atom. 3
35. a) How silver is extracted from its chief ore? (OR) 5
b) i) What are the differences between nuclear reaction and chemical reaction? (any three) 3
ii) What is meant by Q-value of a nuclear reaction. 2
36. a) i) When does entropy increase in a process? 2
ii) Write any three characteristics of free energy - G. (OR) 3
- b) i) How will you distinguish weak and strong electrolytes by measuring conductance? 4
ii) Calculate the pH of 1×10^{-2} M HCl solution. 1
37. a) i) How can the following conversion be effected? 4
A) Glycol \rightarrow dioxan B) Glycerol \rightarrow acrolein
ii) Which member of the following pair would you expect to be more water soluble? 1
 $\text{CH}_3\text{CH}_2\text{OH}$ or $\text{CH}_3\text{CH}_2\text{OCH}_3$ (OR)
- b) i) Write and name all possible ether isomers with the molecular formula $\text{C}_4\text{H}_{10}\text{O}$. 3
ii) How does diethyl ether react with excess of HI? What is the use of this reaction? 2
38. a) i) Write notes on : A) Coupling reactions. B) Carbyl amine reaction. 4
ii) Write the ascending order of the following amines in terms of their boiling point. CH_3NH_2 , 1



(OR)

- b) Explain briefly on characteristics of rocket propellants.