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Register No. 40

Time : 3.00 Hrs.

Half Yearly Examination- 2024
CHEMISTRY

Marks : 70

PART - I

15 x 1 = 15

Answer all the questions.

Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1. Which of the following compound have percentage of carbon ame as that in $CH_2 = CH_2$.
   a) propene b) ethyne c) benzene d) ethane
2. Which of the following pairs of d-orbital will have electron density along the axes?
   a) d_{x^2} , d_{xy} b) d_{xy}, dyz c) d_z2, $d_{x^2-y^2}$ d) d_{xy}, $d_{x^2-y^2}$
3. What would be the IUPAC name for an element with atomic number 111?
   a) unununium b) ununoctium c) ununtrium d) ununbium
4. Sodium hydride [$Na^+ H^-$] formed by a) halogens b) chalogens c) inert gas d) group one elements
5. Which of the following statement is incorrect?
   a) Li^+ has miniumum degree of hydration amount alkali metal cations. b) The oxidation state of K in KO_2 is +1. c) Sodium is used to make Na/Pb alloy. d) $MgSO_4$ is readily soluble in water
6. Consider the following statements. Select the correct statement.
   i) Atmospheric pressure is less at the top of a mountain than at sea level.
   ii) Gases are much more compressible than solids or liquids
   iii) When the atmospheric pressure increases the height of the mercury column rises.
   a) i & ii b) ii & iii c) i and iii d) i, ii and iii
7. The temperature of the system, decreases in an.....
   a) isothermal expansion b) isothermal compression c) adiabatic expansion d) adiabatic compression
8. Solubility of CO_2 gas in cold water can be increased by
   a) increase in pressure b) decrease in pressure c) increase in volume d) none of these
9. Normality of 1.25 M H_2SO_4 is..... a) 1.25 N b) 3.75 N c) 2.5 N d) 2.25 N
10. Non-zero dipule moment is shown by.....a) CO_2 b) p-dichloro benzene c) $CC\ell_4$ d) H_2O
11. Which of the following is optically active? prop-ane
    a) 3-chloro pentane b) 2-chloro ~~pentane~~ c) meso-tartaric acid d) glucose
12. Which of the following species does not acts as a Nucleophile? a) ROH b) ROR c) $PC\ell_3$ d) BF_3
13. The general formula for cyclo butane a) C_nH_n b) C_nH_{2n} c) C_nH_{2n-2} d) C_nH_{2n+2}
14. The raw material for Rasching process..... a) chlorobenzene b) phenol c) benzene d) anisole
15. Match the list I with list II

List - I	List - II
A. Stone leprosy	1. CO
B. Biological magnification	2. Green house gases
C. Global warming	3. Acid Rain
D. Combination with haemoglobin	4. DDT

	A	B	C	D
a)	1	2	3	4
b)	3	4	2	1
c)	2	3	4	1
d)	4	2	1	3

PART - II

Answer any six question. Question No.24 is compulsory. 6 x 2 = 12

16. Define gram equivalent mass.
17. Give the electronic configuration of Cu and Cr.
18. Define modern periodic law.
19. Aerated water bottles are kept under water during summer. Why?
20. Define Gibb's free energy?
21. State law of mass action?
22. Write Markovnikoff's rule.
23. Write Swarts reaction.
24. Identify the functional group in the following compound.
    a) oxalic acid b) acetaldehyde.

PART - III

Answer any six questions. Question No.33 is compulsory. 6 x 3 = 18

25. Write three types of covalent hydrides with example.
26. Give the systematic names for the following.
    (i) washing soda (ii) milk of magnesia (iii) lime
27. Why halogen act as oxidising agent.
28. Define - Normality.
29. Define - Hybridisation.
30. Differentiate BOD and COD.
31. How will you prepare DDT.
32. Write short note on Resonance.
33. If an automobile engine burns petrol at a temperature of 816°C and if the surrounding temperature is 21°C calculate the maximum possible efficiency.

PART - IV

Answer all the questions. 5 x 5 = 25

34. a) A compound on analysis gave the following percentage composition C = 54.55%, H = 9.09%, O = 36.36%. Determine the empirical formula of the compound. **(OR)**
    b) Explain briefly the time independent Schrodinger wave equation.
35. a) Discuss the similarities between Beryllium and Aluminium. **(OR)**
    b) Explain the Pauling method for the determination of ionic radius.
36. a) Derive the values of critical constants in terms of Vanderwaals constants. **(OR)**
    b) List the characteristics of internal energy.
37. a) Discuss the formation of N_2 molecule using MO theory. **(OR)**
    b) Deduce the Vant-Hoff equation?
38. a) Difference between Nucleophile and Electrophile. **(OR)**
    b) Give the IUPAC name of the following compound.

i) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-\underset{\displaystyle Br}{\underset{|}{CH}}-CH_3$ ii) $CH_3-CH_2-O-CH_3$ iii) $CH_2=CH-CH=CH_2$

iv) $CH_3-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-CHO$ v) $CH_3-\underset{\displaystyle Cl}{\underset{|}{CH}}-CH=CH_2$