First Revision Examination 2019-20

Time Allowed : 3.00 Hours]

CHEMISTRY
Section – I

[Max: Marks : 70

Note : i) Answer 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. Carbon form two oxides, namely carbon monoxide and Carbon dioxide. The Equivalent mass of which element remains constant.
   a) C
   b) O
   c) C and O
   d) Neither C nor O

2. Which of the following is the least eletronegative element?
   a) Bromine
   b) Chlorine
   c) Iodine
   d) Hydrogen

3. The hybridisation of oxygen atom in H_2O and H_2O_2 are respectively
   a) SP^3 and SP^3
   b) SP and SP
   c) SP and SP^2
   d) SP^3 and SP^2

4. The general valence shell electronic configuration of alkali metals is
   a) ns^2
   b) ns^{1-2}
   c) ns^1
   d) ns^{1-6}

5. Which of the following statments are incorrect?
   (i) Sodium metal is used in organic qualitative analysis.
   (ii) Hydrogen has three isotopes of which protium is the most common.
   (iii) The maximum number of electron present is L-shell = 18
   (iv) The maximum number of electrons that can be accomodated in a given orbital is 2(2l+2)
   a) (i) (iv)
   b) (i) (iii)
   c) (i) (ii)
   d) (iii) (iv)

6. Maximum deviation from ideal gas is expected from
   a) $CH_{4(g)}$
   b) $NH_{3(g)}$
   c) $H_{2(g)}$
   d) $N_{2(g)}$

7. ΔS is expected to be maxium for the reaction
   a) $Ca_{(S)} + \frac{1}{2} O_{2(g)} \rightarrow CaO_{(S)}$
   b) $C_{(S)} + O_{2(g)} \rightarrow CO_{2(g)}$
   c) $N_{2(g)} + O_{2(g)} \rightarrow 2NO_{(g)}$
   d) $CaCO_{3(S)} \rightarrow CaO_{(S)} + CO_{2(g)}$

8. Which of the following reaction will be favoured at the lower pressure
   a) $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$
   b) $N_{2(s)} + O_2 \rightleftharpoons 2NO_{(g)}$
   c) $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$
   d) $PCl_{5(g)} \rightleftharpoons PCl_{3(g)} + Cl_{2(g)}$

9. **Assertion :** An ideal solution obeys Raoults law.
   Reason : In all ideal solution, solute - solvent as well as solute - solute interactions are similar to solute - solvent interactions.
   a) Both assertion and reason are true and reason is the correct explanation of assertion.
   b) Both assertion and reason are true but reason is not the correct explanation of assertion.
   c) Assertion is true but reason is false
   d) Both assertion and reason are false.

10. Shape and hydridisation of IF_7 molecule.
    a) Trigonal bipyramidal $SP^3 d^3$
    b) Trigonal bipyramidal, $SP^3 d^2$
    c) Pentagonal bipyramidal $SP^3 d^3$
    d) Pentagonal bipyramidal, $SP^3 d^2$

11. **Match the following.**
    1 Secondary Amine - (i) $(CH_3)_3 C - OH$
    2 Secondary Alcohol - (ii) $CH_3 - CH_2 - NH_2$
    3 Primary Amine - (iii) $(CH_3)_2 NH$
    4 Tertary Alcohol - (iv) $CH_3 - CH - CH - CH_3$
                               CH_3 OH

	1	2	3	4
a	(i)	(ii)	(iii)	(iv)
b	(iii)	(iv)	(i)	(ii)
c	(iii)	(iv)	(ii)	(i)
d	(i)	(iv)	(ii)	(iii)

12. The IUPAC name of $CH_3 - CH = C - CH_2 - CH_3$
                                   $CH_2 - CH_2 - CH_3$
    a) 3-Ethyl-2-hexene
    b) 3-Propyl-3-hexene
    c) 4-Ethyl-4-hexene
    d) 3-Propyl-2-hexene

13. The geometrical shape of Carbocation is
    a) Linear
    b) Planar
    c) tetrahedral
    d) Pyramidal

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14. Acetaldehyde $\xrightarrow[\text{(ii) } H_2O/HI]{\text{(i) } CH_3MgI}$ X, X is
   a) 2-Propanol
   c) 1-Propanol
   b) 2-Methyl-2-Propanol
   d) Ethanol
15. Bhopal gas tragedy is a case of ------
   a) Thermal pollution
   d) Nuclear Pollution
   b) Air pollution
   d) Land pollution

Part - II

Answer any six questions. Q.No. 24 is compulsory.   6x2=12

16. State Paull's exclussion principle?
17. Define diagonal relationship?
18. How is Plaster of paris prepared?
19. Define Third law of thermoclynamics?
20. State equillibrium constant (Kc)?
21. Define Isotonic solution?
22. What happen when Ethylene reagent with cold alkaline KMnO4 (Bayer's regend)?
23. Define Smog?
24. The molarity of the solution containing 45g of glucose dissolved in 2kg of water?

Part - III

Answer any six questins. Q.No. 33 is compulsory.   6x3=18

25. Explain Deutrium exchange reaction?
26. State Joule - Thomson effect.
27. Define Hess's law of constant heat summation.
28. Define Bond energy?
29. Explain Lassaigne Sodium fusion test.
30. Explain functional Isomerism with example.
31. Differentiate between neucleopiles and electrophiles.
32. Explain Carbylamine reaction.
33. Calculate the empirical and molecular formula compound containing 76.6.%, Carbon 6.38% hydrogen and rest oxygen its vapour density is 47.

Part - IV

Answer all the questions.   5x5=25

34. (a) (i) Calculate the oxidation number of underlined elements in the following species.   2
   a) $H_2\underline{S}O_4$ b) $O\underline{F}_2$ c) $\underline{Cr}_2O_7$ d) $\underline{C}O_2$
   (ii) Calculate the equivalent mass of Pottasium dichromate. The reduction half-reaction in acid medium is
   $Cr_2O_7^{-2} + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O$ 3
   (OR)
   (b) (iii) Describe the Hund's rule with suitable example   3
   (iv) Give appropriate reason for Ionisation potential of N is greater then that of oxygen.   2
35. (a) (i) How do you convert para hydrogen into Ortho hydrogen?   3
   (ii) Substantiate Lithium fluoride has the lowest soulubility among group one metal fluorides.   2
   (OR)
   (b) (iii) Explain the types of hydrogen bonding with example.   3
   (iv) Distinguish between diffusion and effusion.   2
36. (a) (i) List the characteristics of Gibbs free energy.   3
   (ii) Which of the following gases would you expect to deviate from ideal behaviour under conditions of low temperature F_2, Cl_2, Br_2 ? Explain.   2
   (OR)
   (b) (iii) Derive the relationship between Kp and Kc   5
37. (a) (i) Calculate the Van't hoff factor (i) for a dilute aqueous solution of the strong electrolyte barium hydroxide? (ii) Define Hybridisation.   2
   (OR)
   (b) (iii) Classification of organic compounds based on structure with example.   5
38. (a) (i) a) How will you convert Benzene → Cyclohexane.
   b) Give the β - elimination reaction   3
   (ii) Explain the Markownikoff's rule with suitable exmaple.   2
   (OR)
   (b) (iii) How will you convert the following.
   Benzene → Acetophenone   Chlorobenzene → Biphenyl.   3
   (iv) Distinguish between BOD and COD.