Tsl11C
Second Revision Examination - February 2024

16-02-2024

Standard - 11

Time: 3.00 Hours

CHEMISTRY

Maximum Marks: 70

Part - I

I. Choose the best answer: 15×1=15

1) Sodium nitropruside reacts with sulphide ion to give a purple colour due to the formation of
   a) $[Fe(CN)_5NO]^{3-}$ b) $[Fe(NO)_5CN]^1$
   c) $[Fe(CN)_5NOS]^4$ d) $[Fe(CN)_5NOS]^1$

2) Three gaseous equilibria have value of equilibrium constants as K_1, K_2, K_3 respectively
   (i) $N_2 + O_2 \rightleftharpoons 2NO (K_1)$ (ii) $N_2 + 2NO_2 \rightleftharpoons 2NO_2 (K_2)$ (iii) $2NO + O_2 \rightleftharpoons 2NO_2 (K_3)$
   what is the relation between K_1, K_2 and K_3?
   a) $K_3 = K_1 \times K_2$ b) $K_1 = K_2 \times K_3$ c) $K_2 = K_1 \times K_3$ d) $K = K_1 \times K_2 \times K_3$

3) Which of the following carbocation will be most stable?
   a) Ph_3C^+- b) $CH_3-CH^+_2-$ c) $(CH_3)_2-CH^+$ d) $CH_2=CH-CH_2^+$

4) The Vant Haff factor (i) for a dilute aqueous solution of the strong electrolyte barium hydroxide is
   a) 0   b) 1   c) 2   d) 3

5) The general formula for cycle alkanes
   a) C_nH_n b) C_nH_{2n} c) C_nH_{2n-2} d) C_nH_{2n+2}

6) Assertion :   Oxygen molecule is paramagnetic
   Reason   :   It has two unpaired electrons in its bonding molecular orbital
   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 assertioin
   c) assertion is true but reason is false
   d) both asertion and reason are false

7) The name of $C_2F_4Cl_2$ is
   a) Freon-112   b) Freon-113   c) Freon-114   d) freon-115

8) Photo Chemical smog formed in congested metropolitan cities mainly consists of
   a) ozone, SO_2 and hydrocarbons   b) ozone, PAN and NO_2
   c) PAN, smoke and SO_2 d) Hydrocarbons, SO_2 and CO_2

9) Match the list I and list II and select the answer using the code given below the list

List I		List II	
A	Pressure	1)	Intensive Properly
B	Number of moles	2)	Path functions
C	Density	3)	Extensive Properly
D	Work	4)	State functions

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

10) Calculate the percentage of N in ammonia molecule.
    (molar mass of $NH_3 = 17$ g mol^{-1})
    a) 121.42%   b) 28.35%   c) 82.35%   d) 28.53%

11) What would be the IUPAC name for an element with atomic number 103
    a) Unniltrium   b) Unnilunium   c) Unniltriium   d) Unnilbium

12) The reaction $H_3PO_2 + D_2O \rightarrow H_2DPO_2 + HDO$ indicates that hypo phosphorus acid is
    a) tribasic acid   b) dibasic acid   c) mono basic acid   d) none of these

13) Use of hot air ballon in sports at meterological observation is an applicaiton of
    a) Boyle's law   b) Newton's law   c) Kelvin's law   d) Brown's law

14) For d electron, the orbital angular momentum is
    a) $\dfrac{\sqrt{2}h}{2\pi}$ b) $\dfrac{\sqrt{2}h}{2\pi}$ c) $\dfrac{\sqrt{2 \times 4}h}{2\pi}$ d) $\dfrac{\sqrt{6}h}{2\pi}$

15) When CaC_2 is heated in atmospheric nitrogen in an electric furnace the compound formed is
a) $Ca(CN)_2$ b) CaNCN   c) CaC_2N_2 d) $CaNC_2$

Part - II
Answer any six questions in short. Question No 24 is compulsory: 6×2=12
16) What is the difference between molecular mass and molar mass?
17) What are isoelectronic ions? Give examples.
18) How is plaster of paris prepared?
19) What are ideal gases? In what way real gases differ from ideal gases.
20) State-Le-Chatelier principle?
21) Identify the functional group in the following compounds
a) acetaldehyde   b) oxalic acid   c) dimethyl ether   d) methyl amine
22) What is Resonance or Mesomeric effect?
23) How will you prepare DDT?
24) Calculate the entropy change during the melting of one mole of ice into water at 0°C and 1 atm pressure. Enthalpy of fusion of ice is 6008 J mol^{-1}.

Part - III
Answer any six questions in short. Question No 33 is compulsory: 6×3=18
25) Describe the Aufbau principle.
26) What is water-gas shift reaction?
27) Explain the distinctive behavior of beryllium.
28) State Avagadro's hypothesis.
29) What are spontaneous reactions? What are the conditions for the spontaneity of a process?
30) Draw the Leuis structures for the following species
a) NO_3^- b) SO_4^{2-}
31) Give the IUPAC name of the following compounds:
a) CH_3-O-CH_3 b) $CH_3-CH_2-CH-CHO$ with OH   c) $CH_2=CH-CH=CH_2$
32) How does Huckel rule help to decide the aromatic character of a compound?
33) A hydrocarbon C_3H_6(A) reacts with HBr to form compound (B). Compound (B) reacts with aqueous potassium hydroxide to give (C) of molecular formula C_3H_6O. What are (A), (B), (C) Explain the reactions.

Part - IV
Answer all the questions: 5×5=25
34) a] i) What is the emprical formula of the following?
(a) Fructose ($C_6H_{12}O_6$)   (b) Cafleine ($C_8H_{10}N_4O_2$)
ii) Balance the following equations by oxidation number method
$Cu+HNO_3 \rightarrow Cu(NO_3)_2+NO_2+H_2O$
(OR)
b] Describe the pauling method for the determination of ionic radius.
35) a] i) How is permanent Hardness of water is removed?
ii) What are isotopes? Write the names of isotopes of hydrogen?
(OR)
b] List the characteristics of internal energy.
36) a] Derive K_p and K_c for dissociation of PCl_5?
(OR)
b] Draw Mo diagram of CO and calculate its bond order.
37) a] Write a note on the application of reverse osmosis in water purification.
(OR)
b] Give the principle involved in the estimation of halogen in an organic compound by Carius method.
38) a] Explain the mechanism of SN^2 reaction by highlighting the stereo chemistry behind it.
(OR)
b] Write short notes on the folowing:
i) Photo chemical smog.   ii) Bio chemical oxygen demand (BOD)