Tsi11C

Tenkasi District

Common Quarterly Examination - 2024

25-09-2024

Standard 11

Time Allowed: 3.00 Hours   **CHEMISTRY**   Maximum Marks: 70

PART - I

I. Choose the best answer: **15×1=15**

1) Which of the following compound has percentage of carbon same as that in ethylene (C_2H_4)?

   a) Propene   b) Ethyne   c) Benzene   d) Ethane

2) The oxidation number of hydrogen in LiH is _____.

   a) +1   b) −1   c) +2   d) −2

3) What is the maximum numbers of electrons that can be associated with the following set of quantum numbers? n=3, ℓ=1 and m=−1

   a) 4   b) 6   c) 2   d) =10

4) Which of the following does not represent the mathematical expression for the Heisenberg uncertainty principle?

   a) $\Delta x.\Delta p \geq h/4\pi$ b) $\Delta x.\Delta v \geq h/4\pi m$

   c) $\Delta E.\Delta t \geq h/4\pi$ d) $\Delta E.\Delta x \geq h/4\pi$

5) In the third period the first ionization potential is of the order.

   a) Na > Al > Mg > Si > P   b) Na < Al < Mg < Si < P

   c) Mg > Na > Si > P > Al   d) Na < Al < Mg < P < Si

6) **Assertion** : Permanent hardness of water is removed by treatment with washing soda.

   Reason : Washing soda reacts with soluble calcium and magnesium chlorides and sulphates in hard water to form insoluble carbonates.

   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.

7) **Match the List I with List II and select the correct answer using the code given below the lists:**

List I		List II
A) H_2O_2	-	1. SiH_4
B) D_2O	-	2. PdH
C) Metallic hydride	-	3. Bleach
D) Molecular hydride	-	4. Study of reaction mechanism

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

8) 25g of each of the following gases are taken at 27°C and 600 mm Hg pressure. Which of these will have the least volume?

a) HBr　　　　b) HCl　　　　c) HF　　　　d) HI

9) The compressibility factor is given by

a) $z = pv$　　　b) $z = nRT$　　　c) $z = \dfrac{nRT}{pv}$　　　d) $z = \dfrac{pv}{nRT}$

10) The work done by the liberated gas when 55.85g of iron (molar mass 55.85g mol^{-1}) reacts with hydrochloric acid in an open beaker at 25°C.

a) −2.48 KJ　　　b) −2.22 KJ　　　c) +2.22 KJ　　　d) +2.48 KJ

11) Which among the following is not a state function?

a) Pressure　　　b) Volume　　　c) Temperature　　　d) Work

12) In a chemical equilibrium, the rate constant for the forward reaction is 2.5×10^2 and the equilibrium constant is 50. The rate constant for the reverse reaction is _____.

a) 11.5　　　b) 5　　　c) 2×10^2　　　d) 2×10^{-3}

13) $\overset{\ominus}{C}H_2 - C - CH_3$ and $CH_2 = C - CH_3$ are
$$\qquad\quad \underset{O}{\parallel} \qquad\qquad\qquad \underset{O}{\mid}$$

a) resonating structure　　　　b) tautomers

c) optical isomers　　　　d) conformers

14) The IUPAC name of the compound is

$$CH_3 - CH = C - CH_2 - CH_3$$
$$\qquad\qquad\quad \mid$$
$$\qquad\quad CH_2 - CH_2 - CH_3 \text{ is}$$

a) 3 - Ethyl - 2 - hexene　　　b) 3 - Propyl - 3 - hexene

c) 4 - Ethyl - 4 - hexene　　　d) 3 - Propyl - 2 - hexene

15) Which of the group has highest +I effect?

a) $CH_3 -$　　　b) $CH_3 - CH_2 -$　　　c) $(CH_3)_2 - CH -$　　　d) $(CH_3)_3 - C -$

PART - II

Answer any SIX questions. Question No. 24 is compulsory:　　　　**6×2=12**

16) Define Gram equivalent mass.

17) Give the electronic configuration of Chromium (Cr) and Copper (Cu).

18) How is tritium prepared?

19) State Dalton's law of partial pressure.

20) What are the conditions for the spontaneity of a process?

21) Give a balanced chemical equation for the equilibrium reaction for which the equilibrium constant is given by expression $K_c = \dfrac{[NH_3]^4 \, [O_2]^5}{[NO]^4 \, [H_2O]^6}$.
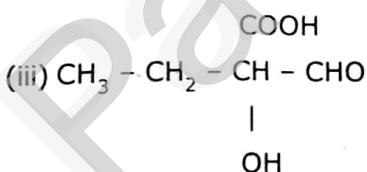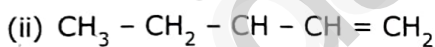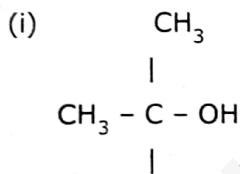
22) What is metamerism?

23) Give the principle of Chromatography.

24) How the mixture of diethyl ether (b.p 308K) and ethyl alcohol (b.p 351K) seperated?

PART - III

Answer any SIX questions. Question No. 33 is compulsory.   **6×3=18**

25) Calculate the oxidation number of underlined elements.

(i) $\underline{C}O_2$ (ii) $H_2\underline{S}O_4$

26) Define orbital. What are the n and ℓ values for 3px and $4dx^2-y^2$ electron?

27) Explain the Diagonal Relationship.

28) Derive Ideal Gas equation.

29) Define reaction quotient.

30) Calculate the entropy change in the system and surrondings, and the total entropy change in the universe during a process in which 245 J of heat flow out of the system at 77°C to the surrounding at 33°C.

31) What is the fundamental group present in the given molecule?

(a) acetone   (b) ethyl acetate   (c) butanol

(d) nitrobenzene   (e) aniline   (f) acetaldehyde

32) Give any three difference between nucleophiles and electrophiles.

33) Give the IUPAC names of the following compounds.

(i) CH_3
                  |
$CH_3 - C - OH$
                  |
                CH_3

(ii) $CH_3 - CH_2 - CH - CH = CH_2$
                      |
                    COOH

(iii) $CH_3 - CH_2 - CH - CHO$
                      |
                    OH

PART - IV

Answer ALL the questions: **5×5=25**

34) a) Balance the following equation by oxidation number method.

(i) $K_2Cr_2O_7 + KI + H_2SO_4 \rightarrow K_2SO_4 + Cr_2(SO_4)_3 + I_2 + H_2O$
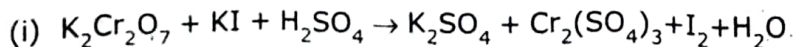
(OR)

b) i) State Pauli Exclusion principle.

ii) For each of the following, give the sub level designation, the allowable m values and the number of orbitals.

(i) $n = 4, \ell = 2$

(ii) $n = 5, \ell = 3$

(iii) $n = 7, \ell = 0$

35) a) Explain the Pauling method for the determination of ionic radius.

(OR)

b) i) Explain the exchange reactions of deuterium. **(2)**

ii) What are isotopes? Write the names of isotopes of hydrogen. **(3)**

36) a) Derive the values of critical constants interms of Vander Waals constants.

(OR)

b) Derive the relation between ΔH and Δu for an ideal gas. Explain each term involved in the equation.

37) a) State the various statements of Second Law of thermodynamics.

(OR)

b) Deduce the Vant Hoff equation.

38) a) Explain various types of constitutional Isomerism (structural isomerism) in organic compounds.   **(OR)**

b) Explain inductive effect with suitable example.

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