KK11Che

Tenkasi District Common Examinations
Common Quarterly Examination - September 2022

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Standard - 11

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

Note: Draw diagrams and write equations wherever necessary.

PART - I

Note: 1. Answer all the questions.   **15×1=15**
       2. **Choose the most suitable answer from the given four alternatives.**

1. 7.5g of a gas occupies a volume of 5.6 litres at 0°C and 1 atm pressure. The gas is
   a) NO   b) N_2O c) CO   d) CO_2

2. Splitting of spectral lines in an electric field is called
   a) Zeeman effect   b) Shielding effect   c) Compton effect   d) Stark effect

3. Possible exchange in chromium for d^5 configuration
   a) 7   b) 10   c) 5   d) 12

4. Assertion : Helium has the highest value of ionisation energy among all the elements known.
   Reason : Helium has the highest value of electron affinity among all the elements known.
   a) Both assertion and reason are true and reason is correct explanation for the assertion
   b) Both assertion and reason are true and reason is not the correct explanation for the assertion
   c) Assertion is true and reason is false   d) Both assertion and the reason are false

5. The covalent radius of chlorine atom is
   a) 0.77 A°   b) 0.99 A°   c) 1.02 A°   d) 1.91 A°

6. Trituim nucleus contains
   a) 1p + 0n   b) 2p + 1n   c) 1p + 2n   d) none of these

7. Equal moles of hydrogen and oxygen gases are placed in a container, with a pin – hole through which both can escape, what fraction of oxygen escapes in the time required for one – half of the hydrogen to escape.
   a) 3/8   b) 1/2   c) 1/8   d) 1/4

8. The correct thermodynamic conditions for the spontaneous reaction at all temperature is
   a) $\Delta H < 0$ and $\Delta S > 0$ b) $\Delta H < 0$ and $\Delta S < 0$
   c) $\Delta H > 0$ and $\Delta S = 0$ d) $\Delta H > 0$ and $\Delta S > 0$

9. If an automobile engine burns petrol at a temperature of 816°C and if the surrounding temperature is 21°C, the maximum efficiency is
   a) 75%   b) 73%   c) 80%   d) 85%

10. Which one of the following is incorrect statement?
    a) for a system at equilibrium, Q is always less than the equilibrium constant.
    b) equilibrium can be attained from either side of the reaction.
    c) presence of the catalyst affects both the forward reaction and reverse reaction to the same extent
    d) Equilibrium constant varied with temperature.

11. In the contact process of manufacturing SO_3, the catalyst used is
    a) Iron   b) Nickel   c) NO   d) V_2O_5

12. The purity of an organic compound is determined by
    a) Chromatography   b) Crystallisation
    c) melting or boiling point   d) both (a) and (c)

13. Match the following

Class of organic compounds	Functional group
(A) Ketone	(1) $-\overset{\overset{\displaystyle O}{\|\|}}{C}-OR$
(B) Amines	(2) $-C \equiv N$
(C) Esters	(3) $-\overset{\overset{\displaystyle O}{\|\|}}{C}-$
(D) Nitrites	(4) $-NH_2$

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

14. The geometrical shape of carbocation is
    a) Linear   b) tetrahedral   c) planar   d) pyramidal
15. Which of the following 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

Note: Answer any SIX of the following.   6×2=12
      Question Number 17 is compulsory.

16. What is the empirical formula of the following? (i) Fructose ($C_6H_{12}O_6$) found in honey (ii) Caffeine ($C_8H_{10}N_4O_2$) a substance found in tea and coffee.
17. Give the electronic configuration of Fe and Cr^{3+}.
18. Define modern periodic law.
19. What is water – gas shift reaction?
20. Gases do not settle at the bottom of a container. Give reason
21. State the third law of thermodynamics.
22. State Le-Chatelier principle.
23. What is sublimation? Give examples.
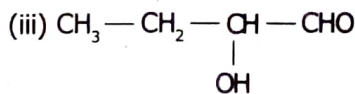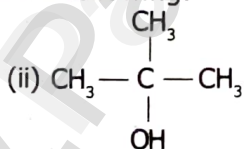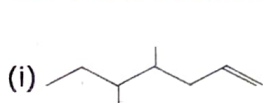24. What is homolytic fission? Give an examples.

PART - III

Note: Answer any SIX of the following.   6×3=18
      Question Number 33 is compulsory.

25. Define equivalent mass.
26. State Hund's rule.
27. Ionisation potential of N is greater than that of O. Give reason.
28. Give three uses of heavy water.
29. A tank contains a mixture of 52.5g of oxygen and 65.1g of CO_2 at 300k the total pressure in the tank is 9.21 atm. Calculate the partial pressure (in atm) of gas in the mixture.
30. Define Hess's law of constant heat summation.
31. What is the effect of added inert gas on the reaction at equilibrium?
32. What are electrophiles and nucleophiles? Give suitable examples for each
33. Give the IUPAC names of the following.

    (i) [structure]   (ii) $CH_3 - \overset{\overset{\displaystyle CH_3}{|}}{\underset{\underset{\displaystyle OH}{|}}{C}} - CH_3$ (iii) $CH_3 - CH_2 - \underset{\underset{\displaystyle OH}{|}}{CH} - CHO$

PART - IV

Note: Answer all the questions.   5×5=25
34. a) Balance the following equation by oxidation number method.
       $FeSO_4 + KMnO_4 + H_2SO_4 \rightarrow Fe_2(SO_4)_3 + MnSO_4 + K_2SO_4 + H_2O$ **(OR)**
    b) i) Derive de – Broglie equation.
       ii) An atom of an element contains 35 electrons and 45 neutrons deduce.
       (i) The number of protons.(ii) All the four quantum numbers for the last electron
35. a) Explain p and d block elements. **(OR)**
    b) Explain the Pauling method for the determination of ionic radius.
36. a) What is temporary hardness of water? How is temporary hardness removed by clark's method? **(OR)**
    b) Write the Vander waals equation for a real gas. Explain the correction term for pressure.
37. a) Derive the relation between ΔH and Δu for a ideal gas. **(OR)**
    b) Derive the relation between K_p and K_c
38. a) Explain the following isomerism with example.
       (i) Functional isomerism (ii) Geometrical isomerism **(OR)**
    b) In an estimation of Sulphur by carius method, 0.2175g of the substance gave 0.5825g of $BaSo_4$ calculate the percentage composition of Sulphur in the compound.