

(ACTC) ADVANCED CHEMISTRY TUITION CENTRE, NAGERCOIL. KK DIST. 9940847892**CHEMISTRY REVISION EXAM - 1****A₁****PART - I****Choose the most appropriate answer****15x1=15**

1. The mass of a chlorine atom is

- (a)
- 5.90×10^{23}
- g (b)
- 5.90×10^{-23}
- kg (c)
- 5.90×10^{-23}
- g (d)
- 5.90×10^{23}
- kg

2. is used as a foaming agent.

- (a) water (b) Lignite (c) Pine oil (d) Caster oil

3. consider the following statements. (i) Fluorine has low electron affinity than chlorine.

- (ii) I.E. decreases with increase in atomic size. (iii) Actinide elements are not radio active

Which of the following statements given above is / are not correct

- (a) (i),(ii) and (iii) (b) only (ii) (c) only (iii) (d) (ii) and (iii)

4. Match the list I with list II and select the correct answer using the code given below the lists

List- I

List - II

A $C_2H_4 + D_2$

1 Deuterium Fluoride

B $D_2 + O_2$

2 Ethylene deuteride

C $D_2 + N_2$

3 Heavy water

D $D_2 + F_2$

4 Heavy ammonia

Code: A B C D

(a) 1 2 3 4

(b) 4 3 2 1

(c) 2 3 4 1

(d) 1 3 4 2

5. The basic character of oxides down the group.....

- (a) increases (b) decreases (c) remains same (d) no change

6. The plane is parallel to z-axis and makes unit intercept an X and Y axis its plane is designated as

- (a) (111) (b) (010) (c) (110) (d) (100)

7. Excluded volume per molecule is.....

- (a)
- $4V_m$
- (b)
- $2V_m$
- (c)
- $V_m / 2$
- (d)
- $4V_m$

8. The compound which contains both ionic and covalent is

- (a)
- CH_4
- (b)
- H_2
- (c) KCN (d) KCl

9. Work done in the reversible expansion is.....

- (a) Minimum (b) Maximum (c) Zero (d) Not predictable

10. The equilibrium constant for the reaction $CO_{2(g)} + C_{(s)} \leftrightarrow 2CO_{(g)}$. When the partial pressure of CO_2 and CO are 0.04 atm and 0.2 atm respectively is.....

- (a) 1.9 atm (b) 1 atm (c) 2 atm (d) 0.04 atm

11. IUPAC name of $CH_2 = CH - CH_2Cl$ is.....

- (a) Allyl chloride (b) 3- chloro 1- propene (c) 1- chloro 2-propene (d) Vinyl chloride

12. In the detection of sulphur using Lassaigne's test the purple colour is developed due to.....

- (a)
- $Na_4[Fe(CNS)_5NO]$
- (b)
- $Na_4[Fe(CN)_5NOS]$
- (c)
- $Fe(CNS)_3$
- (d)
- $Na(CNS)$

13. Diels - Alder reaction is a reaction between.....

- (a) diene and dieneophile (b) electrophile and nucleophile (c) Oxidant and reductant (d) free radicals

14. The ortho and para directing groups are.....

- (a) activating groups (b) deactivating group (c) both (a) & (b) (d) No effect

15. **Statement - I:** Aryl halides do not readily undergo Nucleophilic substitution reactions under ordinary Conditions. **Statements - II:** In Aryl halides C - X bond is short and strong.

a) Both the statements are individually true but statement - II is not the correct explanation of statement - I.

b) Both the statements are individually true and statement - II is not correct explanation of statement - I.

(a) Statement - I is true but statement - II is false. b) Statement - I is false, but statement - II is true.

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PART- II**Answer any six Questions in which Question No. 21 is compulsory. 6 x 2 = 12**

16. What is the molality of the solution containing 25 g of sugar ($C_{12}H_{22}O_{11}$) in 1000g of water ?
17. How many electrons can have $S + \frac{1}{2}$ in a d-sub-shell?
18. Mention any two uses of ozone.
19. Define Boyle's law and Charles's law.
20. Calculate the vapour pressure of the solution. The mole fraction of the solute is 0.25. The vapour pressure of the pure solvent is 0.8 atm.
21. Substantiate with reason NH_3 is a Nucleophile and BF_3 is an electrophile.
22. 0.530g of an organic compound gave 0.90g of $BaSO_4$ in gravimetric determination of sulphur. Calculate the percentage of sulphur.
23. Explain the term aromaticity.
24. Explain why $AlCl_3$ is an ionic compound in aqueous solution while it is covalent in vapour phase.

PART-III**Answer any Six Questions in which Question No. 30 is compulsory. 6 x 3 = 18**

25. How is pure H_2O_2 manufactured?
26. Why is the IE_2 of the alkaline earth metals much higher than the IE_1 ?
27. Explain why is Na atom bigger than the atoms of both lithium and magnesium?
28. What are Miller indices?
29. Write the expression for the equilibrium constant (K_c) for the reaction and how is it related to K_p for the reaction.
30. What are the scope of chemical kinetics?
31. How would you convert the following.
32. Explain the following terms.
33. Complete the following reaction.
- (a) $CH_2 = CH_2 + KMnO_4 \rightarrow ?$ (b) $CH_3CH = CH_2 \rightarrow ?$ (c) $C_2H_6 = C = CH_2 + O_3 \rightarrow ?$

PART - IV**Answer All the Questions.****5 x 5 = 25**

34. (a) (i) 4.5g of urea (molecular mass = 63 g/mol) are dissolved in water and solution is made to 100 ml in a volumetric flask. Calculate the molarity of solution. (2)
- (ii) A flask contains 53.1 ml of 0.150M $Ca(OH)_2$ solution. How many ml of 0.350 M Na_2CO_3 are required to react completely with $Ca(OH)_2$ in the following reaction. (3) (OR)
- (b) What is roasting? Explain different types of roasting with suitable example. (5)
35. (a) (i) Give the values for all quantum numbers for 2p electrons in nitrogen ($z = 7$) (2)
- (ii) Distinguish between an orbit and orbital. (3) (OR)
- (b) (i) Explain the liquefaction of gases by Linde's method. (3)
- (ii) Write the Limitations of Vanderwaal's equation of state. (2)
36. (a) (i) Mention the general characteristics of resonance. (3)
- (ii) Distinguish between sigma and pi bonds. (2) (OR)
- (b) Describe the factors on which the rate of reaction depends. (5)
37. (a) (i) Write the differences between an exothermic and an endothermic process. (3)
- (ii) Explain thermal and mechanical equilibrium process (2) (OR)
- (b) (i) Explain the purification of compounds by using thin layer chromatography. (3)
- (ii) Under what conditions, would you prefer steam distillation as a purification technique? (2)
38. (a) Give the structural formula for (i) pent-1-ene-3-one, (ii) prop (iii) 3-methyl butanoic acid, (iv) Neopentane, (V) 3-ethyl-2-methyl hexane. (5) (OR)
- (b) An organic compound 'A' having molecular formula C_7H_7Cl gives the following reactions.
- (i) on reduction with Zn-Cu couple, it gives toluene.
- (ii) on oxidation with alkaline $KMnO_4$ it gives benzoic acid.
- Identify the compound 'A' and write equation for reactions (i) and (ii). (5)

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(ACTC) ADVANCED CHEMISTRY TUITION CENTRE, NAGERCOIL. KK DIST. 9940847892**CHEMISTRY REVISION MODEL EXAM – 2****A₂****PART-I****MARKS :70****Choose the most appropriate answer**

1. The oxidation number of M in $MnSO_4$
- (a) +4 (b) +2 (c) +6 (d) 0
2. An example for platinum metal is.....
- (a) Ge (b) Ir (c) As (d) Sb
3. Consider the following statements
- (i) Transition metals have the $ns^{1-2} (n-1)d^{1-10}$ electronic configuration
- (ii) Second ionisation potential is lesser than the first ionisation potential
- (iii) Cl^- ion is bigger than Cl atom

Which of the following statement(s) given above is / are not correct

- (a) (i), (ii) and (iii) (b) only (ii) (c) only (iii) (d) (ii) and (iii)
4. Match the list-I with list-II and select the correct answer using the code given below the lists.

List-I

- A Li vapour
B Na + liq. NH_3
C Isoprene
D H_2O_2

List-II

1. Bleaching agent
2. Artificial rubber
3. Intense blue solution
4. Calamin red colour

Code:

- A B C D
- (a) 1 2 3 4
(b) 4 3 2 1
(c) 2 3 4 1
(d) 1 2 4 2
- 5..... is known as inorganic benzene.
- (a) BF_3 (b) $B_2O_4N_7$ (c) C_2H_2 (d) Diborane
6. Crystalline solids that exhibit different physical properties in all directions are called as
- (a) anisotropic (b) isotropic (c) symmetric (d) differential
7. The rate of diffusion of gas is To square root of molecular mass.
- (a) inversely proportional (b) directly proportional (c) is equal (d) not related
8. The molecule which has two bond pairs and two lone pairs of electrons.....
- (a) NH_4^+ (b) PCl_5 (c) SO_2 (d) H_2O
9. Freezing of a liquid at the freezing point is an..... process.
- (a) reversible (b) endothermic (c) exothermic (d) spontaneous
10. $K_p \neq K_c$ for equilibrium.....
- (a) $PCl_5 \leftrightarrow PCl_3 + Cl_2$ (b) $H_2 + I_2 \leftrightarrow 2HI$ (c) $N_2O_4 \leftrightarrow 2NO_2$ (d) $N_2 + O_2 \leftrightarrow 2NO$
11. The unsaturated hydrocarbon which contains one C – C sigma bond and one C – C pi bond are known as.....
- (a) alkanes (b) alkynes (c) alkenes (d) alkyls
12. 0.12g of an organic compound gave on combustion 0.11g of CO_2 . Calculate the percentage of carbon is
- (a) 23% (b) 25% (c) 27% (d) 28%
13. $CH_3C \equiv CH \rightarrow A:A$ is
- (a) CH_3CHO (b) CH_3COCH_3 (c) CH_3CH_2CHO (d) $CH_3CH_2COCH_3$
14. Benzene does not decolourise alkaline Solution
- (a) $KMnO_4$ (b) $FeSO_4$ (c) $NaCl$ (d) $K_2Cr_2O_7$
15. Statement – I: Organic halides are insoluble in water
Statement – II: Organic halides are unable to form strong H- bond with water
- (a) Both the statements are individually true but statement – II is not the correct explanation
Of statement – I
- (b) Both the statements are individually true and statement – II is the correct explanation of statement – I
- (c) Statement – I is true but statement – II is false
- (d) Statement – I is false, but statement – II is true

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16. Calculate the oxidation number of underlined elements in the following species.



17. Write the electronic configuration of chromium and copper.

18. Why NH_3 has high boiling point than PH_3 ?

19. What are the units of vanderwaal's constants 'a' and 'b'?

20. 10g of an organic substance when dissolved in two litres of water gave an osmotic pressure of 0.59 atm, at 7°C. Calculate the molecular weight of the substance.

21. Explain the term "Catenation".

22. 0.36g of a nitrogenous organic compound was kjeldahlised and the ammonia liberated was exactly neutralized by 20ml of 0.3N H_2SO_4 . Calculate the percentage of nitrogen in compound.

23. Convert sodium benzoate \rightarrow Benzene.

24. Give the electron dot representation for PH_3 and ethane.

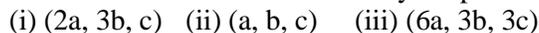
PART - III Answer any six Questions in which Question No. 30 is compulsory.

25. Explain why alkali metals possess only +1 oxidation state.

26. Bring out the relationship between Be and Al.

27. Out of fluorine and chlorine, which has greater electron gain enthalpy?

28. Calculate the miller indices of crystal planes which cut through the crystal axes at



29. The value of the equilibrium constant for the reaction $\text{H}_2 + \text{I}_2 \leftrightarrow 2\text{HI}$ is 54 at 700°k. In one experiment the equilibrium concentrations of iodine and hydrogen iodide are 1.3×10^{-3} and 1.6×10^{-2} moles respectively. Calculate the equilibrium concentrations of hydrogen.

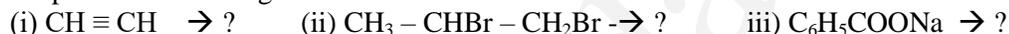
30. (i) Explain why the rate of a reaction increases with the increase in temperature.

(ii) Write the rate law of $p\text{A} + p\text{B} \rightarrow \text{IC} + m\text{D}$ reaction.

31. Write note on Wurtz – Fitting reaction.

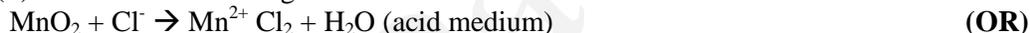
32. Give an example of monohydric, dihydric and trihydric alcohols. Write their IUPAC name.

33. Complete the following reactions.

**PART - IV Answer All the Questions.**

34. (a) (i) Identify oxidized and reduced species in $\text{H}_2\text{S} + \text{Cl}_2 \rightarrow 2\text{HCl} + \text{S}$. (2)

(ii) Balance the following redox reaction. (3)



34. (b) (i) What is the principle involved in Bessemer process. (2)

(ii) Explain the froth flotation process with neat diagram. (3)

35. (a) (i) Describe Aufbau principle. Explain its significance in the electronic build up of atoms. (3)

(ii) Using s, p, d, f notations. Describe the orbital with the following quantum numbers

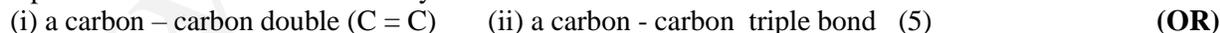


(OR)

35. (b) (i) Describe Claude's process of liquefaction of gases with neat diagram. (3)

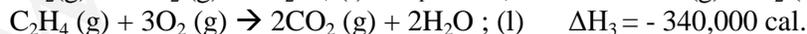
(ii) Define Joule – Thomson effect. (2)

36. (a) Explain how the valence bond theory accounts for



36. (b) Compare and contrast the terms, order and molecularity of a reaction. (5)

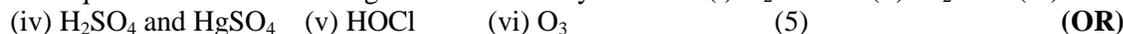
37. (a) (i) Calculate the heat of formation of ethylene from the following data: (3)



(ii) ΔH for the reaction at 298 k $\text{CO}(\text{g}) + \frac{1}{2} \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g})$ is 282.85 kJ mol⁻¹. Calculate ΔU of the reaction. (2) (OR)

37. (b) Define and explain the types of paper chromatography. (5)

38. (a) Give equations for the following reactions of acetylene with (i) H_2 / Ni (ii) Br_2 (iii) HBr



38. (b) An element occupies group No. 16 and period number 2. This element on passing through silencing electric discharge forms (A). (A) also reacts with lead sulphide and forms (B). (A) also reacts with BaO_2 and forms (C). It reacts with H_2O_2 and forms (D). Identify the element (A), (B), (C) and (D) (5)