

ACTC ADVANCED CHEMISTRY TUITION CENTRE, 41/1-PWD ROAD, NAGERCOIL-9940847892

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ADVANCED CHEMISTRY TUITION CENTRE, NAGERCOIL, 9940847892.
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+1 CHEMISTRY

30 DAYS PLAN &

26 Days QUESTION PAPER

PUBLIC EXAM 2024

AIM: CENTUM MARKS

2023-24 XI ART (ANNUAL REVISION TEST Time table)**DON'T STRESS!****DO YOUR BEST !!****FORGET THE REST!!!****Share, subscribe, comment, Like @ our You Tube channel:****ACTC Educare**

| ART | DATE | DAY | LESSON | QUESTION MARK | MARKS | MARK | SIGN |
|----------------------------------|------|-----|--------|---------------|-------|------|------|
| ANNUAL REVISION EXAM-2024 | | | | | | | |
| 1 | | | 1 | FULL | 50 | | |
| 2 | | | 2 | FULL | 50 | | |
| 3 | | | 3 | FULL | 50 | | |
| 4 | | | 4 | FULL | 50 | | |

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| | | | | | | | |
|----|----------|-----------|------------------|---------------------------|-----|--|--|
| 5 | | | 5 | FULL | 50 | | |
| 6 | | | 1-5 | PROBLEM | 50 | | |
| 7 | | | 1-5 INORGANIC | MODEL 1 | 70 | | |
| 8 | | | 6 | FULL | 50 | | |
| 9 | | | 7 | FULL | 50 | | |
| 10 | | | 8 | FULL | 50 | | |
| 11 | 17-01-24 | WEDNESDAY | 9 | FULL | 50 | | |
| 12 | 19-01-24 | FRIDAY | 10 | FULL | 50 | | |
| 13 | 22-01-24 | MONDAY | 6,7,8,9 | PROBLEM | 50 | | |
| 15 | 24-01-24 | WEDNESDAY | 6-10 | PHYSICAL MODEL | 50 | | |
| 16 | 26-01-24 | FRIDAY | 11 | FULL | 50 | | |
| 17 | 28-01-24 | SUNDAY | 12 | FULL | 50 | | |
| 18 | 29-01-24 | MONDAY | 13 | FULL | 50 | | |
| 19 | 31-01-24 | WEDNESDAY | 14 | FULL | 50 | | |
| 20 | 02-02-24 | FRIDAY | 15 | FULL | 50 | | |
| 22 | 05-02-24 | MONDAY | 11, 12, 13 | NAME REACTION | 50 | | |
| 23 | 07-02-24 | WEDNESDAY | 11, 13, 14 | PROBLEM | 50 | | |
| 24 | 09-02-24 | FRIDAY | 11-15 | ORGANIC MODEL | 70 | | |
| 25 | 11-02-24 | SUNDAY | IOC | ONE MARK | 50 | | |
| 26 | 12-02-24 | MONDAY | PC | ONE MARK | 50 | | |
| 27 | 14-02-24 | WEDNESDAY | OC | ONE MARK | 50 | | |
| 28 | 16-02-24 | FRIDAY | PRACTICAL | MODEL | 15 | | |
| 29 | 19-02-24 | MONDAY | FULL PORTION | MODEL EXAM 3 HOURS | 110 | | |
| 30 | 21-02-24 | WEDNESDAY | FULL PORTION | MODEL EXAM 3 HOURS | 110 | | |
| 31 | 23-02-24 | FRIDAY | FULL PORTION | MODEL EXAM 2 1/2 HOURS | 110 | | |
| 32 | 25-02-24 | SUNDAY | FULL | MODEL EXAM | 70 | | |

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| | | | | | | | |
|---------------------------|----------|-----------|-----------------|-------------|-----|--|--|
| | | | PORTION | 2 1/2HOURS | | | |
| 33 | 26-02-24 | MONDAY | FULL PORTION | MODEL EXAM | 70 | | |
| FINAL ROUND – PUBLIC EXAM | | | | | | | |
| 34 | 15-03-24 | MONDAY | 6-8 | REVISION EX | 50 | | |
| 35 | 16-03-24 | TUESDAY | 1-5 | MODEL | 70 | | |
| 36 | 17-03-24 | WEDNESDAY | 6-10 | MODEL | 70 | | |
| 37 | 18-03-24 | THURSDAY | 11-15 | MODEL | 70 | | |
| 38 | 19-03-24 | FRIDAY | MODEL | MODEL | 110 | | |

“NO PAIN , NO GAIN”.**Never Dreamed about success, Worked for it.****WISH U ALL THE BEST ACTC**

“May God's guidance be with you during the Exam and may you be able to answer each question correctly. My prayers and Blessings are with you”.

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DAY 1 ART 1 UNIT 1 Basic concepts of chemistry and chemical calculation Marks: 50

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ACTC ADVANCED CHEMISTRY TUITION CENTRE, 41/1-PWD ROAD, NAGERCOIL-9940847892**ANSWER THE FOLLOWING 10x2=20**

1. Define relative atomic mass.
2. What do you understand by the term mole.
3. Define equivalent mass.
4. Calculate relative molecular mass of glucose.
5. Distinguish between oxidation and reduction.
6. Calculate gram equivalent mass of sulphuric acid.
7. Define empirical formula.
8. How many moles of hydrogen is required to produce 10 moles of ammonia? (15)
9. Define limiting, excess reagent.
10. Define disproportionation reaction. Give an example.
11. What is the empirical formula of the following ?

Fructose ($C_6H_{12}O_6$), Caffeine ($C_8H_{10}N_4O_2$), acetic acid ($C_2H_4O_2$), Lactic acid ($C_3H_6O_3$)

ANSWER THE FOLLOWING 5x3=15

12. Calculate the molar mass of the following compounds.

i) urea [$CO(NH_2)_2$] ii) acetone [CH_3COCH_3] iii) boric acid [H_3BO_3]

13. Calculate the average atomic mass of naturally occurring magnesium using the following data

| Isotope | Isotopic atomic mass | Abundance (%) |
|-----------|----------------------|---------------|
| Mg^{24} | 23.99 | 78.99 |
| Mg^{26} | 24.99 | 10.00 |
| Mg^{25} | 25.98 | 11.01 |

14. In a reaction $x + y + z_2 \rightarrow xyz_2$ identify the Limiting reagent if any, in the following reaction mixtures.

- (a) 200 atoms of x + 200 atoms of y + 50 molecules of z_2
- (b) 1 mol of x + 1 mol of y + 3 mol of z_2
- (c) 50 atoms of x + 25 atoms of y + 50 molecules of z_2

15. What is the difference between molecular mass and molar mass? Calculate the molecular mass and molar mass for carbon monoxide.

16. Define combination & decomposition reaction with an example.

17. Explain displacement reaction. Give an example.

ANSWER THE FOLLOWING 3x5=15

18. Explain balance the equation steps of ion electron method. Give an example.

19. Define oxidation number. Explain rules of oxidation number.

20. Calculate the empirical and molecular formula of a compound containing 76.6% carbon, 6.38 % hydrogen and rest oxygen its vapour density is 47.

All the best score centum marks

DAY 2 ART 2

UNIT 2 Quantum Mechanical model of atom

Marks: 50

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ACTC ADVANCED CHEMISTRY TUITION CENTRE, 41/1-PWD ROAD, NAGERCOIL-9940847892**Answer the following****11x2=22**

1. State Pauli's exclusion principle.
2. Define Aufbau principle.
3. Heisenberg uncertainty principle.
4. Principal Quantum number.
5. Magnetic Quantum number.
6. Write note on s orbital.
7. Write note on p orbital.
8. State Hund's rule.
9. Write note on d orbital.
10. Write E.C of Cr^{3+} , Mn^{2+} .
11. Calculate the uncertainty in the position of an electron, if the uncertainty in its velocity is $5.7 \times 10^5 \text{ ms}^{-1}$
12. Calculate the orbital angular momentum for d and f orbital.

Answer the following 7x4=28

13. Explain briefly the time independent schrodinger wave equation.
14. Explain main features of the quantum mechanical model of an atom.
15. Explain Rutherford α -ray scattering experiment.
16. Explain Bohr atom model & limitation.
17. Derive De – Broglie equation.
18. Explain azimuthal, spin quantum numbers.
19. Explain Davison and Germer experiment.

ALL THE BEST TO SCORE CENTUM**Share, subscribe, comment, Like @ our You Tube channel:****ACTC Educare****DAY 3 ART 3****UNIT 3 Periodic classification of elements****Marks: 50****E.MUTHUSAMY MSc(Chem), MSc(Psy), MEd., MPhil., MA(Eng), MA(T), MA(PA), MA(Soc), BLISc., DMLT.****B. SARANYA MUTHUSAMY BE., BEd., You Tube: ACTC Educare Whatsapp: 9940847892****Kindly send me your answer keys to us - padasalai.net@gmail.com**

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1. Antoine Lavoisier classification.(69)
2. State Johann Dobereiner's law of triads.(69)
3. State the Newland's law of octaves.(70)
4. Lothar Meyer arrangement.(70)
5. State Mendeleev's periodic law.(70)
6. Write note on anomalies of Mendeleev's periodic table.(72)
7. State modern periodic law.(73)
8. Mention the names of the elements with atomic number 101, 102, 109 and 110. (75)
9. Write note on s- block elements.(77)
10. Write note on p- block elements.(78)
11. Write note on d- block elements.(78)
12. Write note on f- block elements. (78)
13. Define atomic radius.(79)
14. Define effective nuclear charge & formula.(80)
15. Define ionic radius.(83)
16. Define ionization energy. The first ionization energy of Nitrogen is greater than that of Oxygen- give appropriate reason.(84)
17. Define electron gain enthalpy or electron affinity. Give its unit.(86)
18. Define electronegativity.(87)
19. Define valency. How is it determined? (88)
20. Write note on the diagonal relationship.(90)
21. Write the general electronic configuration of s-, p-, d-, and f-block elements?(78)

Answer the following questions in detail: 2x5=10

22. Explain Pauling method to determine ionic radii.(83)
23. By using Paulings method calculate the ionic radii of K^+ and Cl^- ions in the potassium chloride crystal. Given that $d_{K+Cl^-} = 3.14 \text{ \AA}$

ALL THE BEST SCORE CENTUM MARKS**E.MUTHUSAMY MSc(Chem), MSc(Psy), MEd., MPhil., MA(Eng), MA(T), MA(PA), MA(Soc), BLISc., DMLT.****B. SARANYA MUTHUSAMY BE., BEd., You Tube: ACTC Educare Whatsapp: 9940847892****Kindly send me your answer keys to us - padasalai.net@gmail.com**

ACTC ADVANCED CHEMISTRY TUITION CENTRE, 41/1-PWD ROAD, NAGERCOIL-9940847892**DAY 4 ART 4 UNIT 4 Hydrogen****Marks: 50****Answer the following:****14x2=28**

1. Define isotopes? Write the names of isotopes of hydrogen.(101)
2. Write note on ortho hydrogen and para hydrogen. (102)
3. How do you convert parahydrogen into ortho hydrogen?(102)
4. Preparation of hydrogen. **(103)**
5. Preparation of Deuterium from heavy water. (104)
6. Preparation of Tritium. (104)
7. Explain the exchange reactions of deuterium. (105)
8. Properties of Tritium. (105)
9. Structure of water. (106)
10. Uses of heavy water.(111)
11. Preparation of hydrogen peroxide. (111)
12. Write note on Ionic hydrides. (113)
13. Covalent hydrides. (113)
14. Metallic hydrides. (113)
15. What are the types of hydrogen bonding? Give an example. (114)

Answer the following**4x3=12**

16. Uses of hydrogen.
17. Explain why hydrogen is not placed with the halogen in the periodic table.
18. Predict which of the following hydrides is a gas on a solid (a) HCl (b) NaH. Give your reason.
19. Write the expected formulas for the hydrides of 4th period elements. What is the trend in the formulas? In what way the first two numbers of the series different from the others?
20. Do you think that heavy water can be used for drinking purposes ?

Answer the following**2x5=10**

21. Explain removal of temporary Hardness, permanent hardness water.
22. A group metal (A) which is present in common salt reacts with (B) to give compound (C) in which hydrogen is present in -1 oxidation state. (B) on reaction with a gas (C) to give universal solvent (D). The compound (D) on reacts with (A) to give (E), a strong base. Identify A, B, C, D and E. explain the reactions.
23. An isotope of hydrogen (A) reacts with diatomic molecule of element which occupies group number 16 and period number 2 to give compound (B) is used as a modulator in nuclear reaction. (A) adds on to a compound (C), which has the molecular formula C_3H_6 to give (D). Identify A, B, C and D.

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ACTC ADVANCED CHEMISTRY TUITION CENTRE, 41/1-PWD ROAD, NAGERCOIL-9940847892**DAY 5 ART 5 UNIT 5 Alkali and alkaline Earth metals****Marks: 50****Answer the following 15x2=30**

1. Among the alkali metal halides, which is covalent? Explain with reason. (130)
2. Why NaOH is much more water soluble than NaCl? BB
3. Give any three similarities between beryllium and aluminum. 140
4. Among the alkaline earth metals BeO is insoluble in water but other oxides are soluble. Why? 142
5. Substantiate Lithium fluoride has the lowest solubility among group one metal fluorides. 132
6. Mention the uses of plaster of paris. 148
7. Beryllium halides are Covalent whereas magnesium halides are ionic why? 143
8. Why alkaline earth metals are harder than alkali metals. BB
9. How is plaster of paris prepared? 147
10. Anomalous behavior of beryllium. 139
11. Give any four properties of Beryllium that are different from other elements of the group. 139
12. Give uses of beryllium. 141
13. Give uses of calcium. 141
14. Give uses of Gypsum. 146
15. Give the systematic name- i) milk of magnesia (ii) lime 144
16. Write balanced chemical equation. 130
 - (i) Lithium metal with nitrogen gas
 - (ii) Rubidium with oxygen gas

Answer the following 4x5=20

7. Discuss the similarities between Li and Mg. 140
8. Explain biological importance of Mg and Ca. 148
9. Explain uses of alkali metals. 131
10. Explain common features of Group 1 elements. 127

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ACTC ADVANCED CHEMISTRY TUITION CENTRE, 41/1-PWD ROAD, NAGERCOIL-9940847892**DAY 6 ART 6****UNIT 1 TO 3 INORGANIC PROBLEM****Marks: 50****Answer the following****15x2=30**

1. Calculate the number of moles present in 9g of ethane.
2. Calculate the number of molecules of oxygen gas that occupies a volume of 22.4ml at 273K and 3atm pressure.
3. Calculate equivalent mass of sulphuric acid.
4. 0.456g of a metal gives 0.606g of its chloride. Calculate the equivalent mass of the metal.
5. How many moles of hydrogen is required to produce 10 moles of ammonia?
6. Calculate the amount of water produced by the combustion of 32g of methane.
7. How much volume of carbon dioxide is produced when 50g calcium carbonate is heated completely under standard conditions?
8. How much volume of chlorine is required to form 11.2L of HCl at 273K and 1 atm pressure?
9. Calculate the oxidation number of i) $\underline{\text{C}}$ in CO_2 ii) $\underline{\text{S}}$ in H_2SO_4
10. Calculate the molar mass of the following compounds (i) urea $[\text{CO}(\text{NH}_2)_2]$ (ii) acetone $[\text{CH}_3\text{COCH}_3]$
11. The density of carbon dioxide is equal to 1.965 kg m^{-3} at 273 K and 1atm pressure. Calculate the molar mass of CO_2 .
12. Mass of one atom of an element is $6.645 \times 10^{-23} \text{ g}$. How many moles of element are there in 0.320 kg.
13. How many moles of ethane is required to produce 44 g of $\text{CO}_2(\text{g})$ after combustion.
14. Calculate the uncertainty in position of an electron, if $\Delta v = 0.1\%$ and $v = 2.2 \times 10^6 \text{ ms}^{-1}$
15. Calculate the uncertainty in the position of an electron, if the uncertainty in its velocity is $5.7 \times 10^5 \text{ ms}^{-1}$.
16. The experimental internuclear distance in Cl_2 molecule is 1.98 \AA . Calculate covalent radius.

Answer the following**7x3=21**

17. An acid found in tamarinds on analysis shows the following percentage composition: 32 % Carbon; 4 % Hydrogen; 64 % Oxygen. Find the empirical formula of the compound.
18. A Compound on analysis gave the following percentage composition C=54.55%, H=9.09%, O=36.36%. Determine the empirical formula of the compound.
19. i) If the entire quantity of all the reactants is not consumed in the reaction. Which is the limiting reagent?
ii) calculate the quantity of urea formed and unreacted quantity of the excess reagent.
20. The reaction between Aluminium and ferric oxide can generate temperatures up to 3273 K and is used in welding metals. (Atomic mass of Al = 27u Atomic mass of O = 16u) $2\text{Al} + \text{Fe}_2\text{O}_3 \rightarrow \text{Al}_2\text{O}_3 + 2\text{Fe}$; If, in this process, 324 g of Aluminium is allowed to react with 1.12 kg of ferric oxide. (i) Calculate the mass of Al_2O_3 formed. (ii) How much of the excess reagent is left at the end of the reaction?
21. Calculate the empirical and molecular formula of a compound containing 76.6% carbon, 6.38 % hydrogen and rest oxygen its vapour density is 47.
22. A Compound on analysis gave Na = 14.31 % S = 9.97% H = 6.22% and O = 69.5% calculate the molecular formula of the compound if all the hydrogen in the compound is present in combination with oxygen as water of crystallization. (molecular mass of the compound is 322).
23. By using Pauling's method calculate the ionic radii of K^+ and Cl^- ions in the potassium chloride crystal. Given that $d_{\text{K}^+\text{Cl}^-} = 3.14 \text{ \AA}$

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24. Calculate de-Broglie wavelength in the i) A 6.626kg iron ball moving with 10ms^{-1} . ii) an electron moving at 72.73ms^{-1} . (41)

ALL THE BEST SCORE CENTUM MARKS**DAY 7 ART 7****UNIT 1-5 INORGANIC MODEL****Marks: 70****Answer the following****8x2=16**

1. What do you understand by the term mole.
2. State Heisenberg uncertainty principle.
3. Describe the Aufbau principle.
4. State Hund's rule. Give an example.
5. Define modern periodic law.
6. What are isoelectronic ions? Give examples.
7. Write note on diagonal relationship.
8. Explain the exchange reactions of deuterium.
9. Discuss the similarities between Beryllium and Aluminium.
10. Preparation, uses of plaster of Paris.

Answer the following**8x3=24**

11. Calculate the molar mass of the following compounds.
i) urea $[\text{CO}(\text{NH}_2)_2]$ ii) acetone $[\text{CH}_3\text{COCH}_3]$ iii) boric acid $[\text{H}_3\text{BO}_3]$
12. Explain Davison and Germer experiment.
13. Explain DeBroglie equation.
14. Give the electronic configuration of Ca, Mn^{2+} and Cr^{3+} .
15. Define ortho and para hydrogen. How do you convert para hydrogen into ortho hydrogen?
16. What is effective nuclear charge? Calculate effective nuclear charge of Sc(4s)
17. Calculate equivalent mass of H_2SO_4 , KOH.
18. Write note on Magnetic quantum number.
19. What are the uses of alkali metals.

Detail**6x5=30**

20. A Compound on analysis gave Na = 14.31% S = 9.97% H= 6.22% and O= 69.5% calculate the molecular formula of the compound if all the hydrogen in the compound is present in combination with oxygen as water of crystallization. (molecular mass of the compound is 322).
21. Explain main features of the quantum mechanical model of atom.
22. Explain the Pauling method for the determination of ionic radius.
23. Preparation and uses of washing soda.
24. Explain types of hydrides.
25. What is meant by temporary hardness of water? How to remove.
26. Describe biological importance of Magnesium and calcium.

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DAY 8 ART 8**UNIT 6 Gaseous state****Marks: 50****ANSWER THE FOLLOWING****20X2=40**

1. What are difference between gas and vapour. (159)
2. Boyle's experiment. (160)
3. State Boyle's law. (160)
4. All passenger aeroplane cabins have to be artificially pressurized? (161)
5. State Charles law.(162)
6. State Gay Lusaac' law. (164)
7. State Avogadro's law. (165)
8. What are ideal gases? (165)
9. State Dalton's law of partial pressures.(166)
- 10.State Grahams law of diffusion. (168)
- 11.Distinguish between diffusion and effusion.168)
- 12.Define compressibility factor. (169)
- 13.Define Boyle temperature or Boyle point. (171)
- 14.Define critical temperature.
- 15.Define critical pressure
- 16.Define critical volume.(173)
- 17.Define Joule-Thomson effect. (175)
- 18.Define inversion temperature. (175)
- 19.What are the methods used for liquefaction of gases. (175)
20. What are the applications of Dalton's law of partial pressure?(167)
- 21.Name two items that can serve as a model for Gay Lussac's law and explain.

Answer the following in detail**2x5=10**

- 22.Derive ideal gas equation. (165)
- 23.Derive critical constants in terms of Vander Waals constants. (174)

All the best score centum marks

DAY 9 ART 9**UNIT 7 Thermodynamics****Marks: 50****Answer the following 15x2=30**

1. What is isolated system? Give example. (188)
2. Distinguish between extensive and intensive property? (189)
3. Define adiabatic process? (190)
4. What is state and path functions? Give two examples. (190)
5. Explain sign convention of heat and work. (194)
6. Define Zeroth law of thermodynamics (or) Law of thermal equilibrium. (195)
7. State first law of thermodynamics. (195)
8. Define molar heat capacity. Give its Unit. (201)
9. Relationship between C_p and C_v (201)
10. What are the applications of the heat of combustion. (205)
11. Define heat of solution. Give an example. (206)
12. State Hess's law. (207)
13. Define lattice energy. (208)
14. Explain various statement of second law thermodynamics. (210)
15. Define Gibbs free energy & character (214)
16. What are the Condition (Criteria) for spontaneity of a process. (215)
17. State the third law of Thermodynamics. (218)

Answer the following 4x5=20

18. Calculate the work involved in expansion and compression process. (193)
19. List the characteristics of internal energy. (191)
20. Explain the relation between enthalpy (H) and internal energy (U). (197)
21. Explain Bomb calorimeter. (203)
22. Explain Born-Haber cycle. (208)

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DAY 10 ART 10

UNIT 8 physical and chemical Equilibrium

Marks: 50

Answer the following

15x2=30

1. State Le- Chatelier Principle(16)
2. State law of mass action.(5)
3. What is reaction quotient. (11)
4. Homogeneous equilibrium give an example.(5)
5. Heterogeneous equilibrium give an example. (5)
6. Application of equilibrium constant.(10)
7. Effect of concentration. (16)
8. Effect of Pressure. (17)
9. Effect of Temperature. (18)
10. Effect of catalyst.(18)
11. Effect of Inert gas.(19)
12. Q compare Kc.(11)
13. Why the chemical equilibrium is referred to as Dynamic equilibrium. (5)
14. Write a balanced chemical equation for a equilibrium reaction for which the equilibrium constant is given by expression $K_C = \frac{[NH_3]^4 [O_2]^5}{[NO]^4 [H_2O]^6}$
15. The equilibrium concentrations of NH_3 , N_2 and H_2 are $1.8 \times 10^{-2}M$ and $3 \times 10^{-2}M$ respectively. Calculate the equilibrium constant for the formation of NH_3 from N_2 and H_2 .(14)
16. One mole of H_2 and one mole of I_2 are allowed to attain equilibrium mixture contains 0.4mole of HI. Calculate the equilibrium constant. (13)

Answer the following

4x5=20

17. Derive the relation between K_p and K_c .(6)
18. Derive a general expression for the equilibrium constant K_p and K_c for the reaction $3H_{2(g)} + N_{2(g)} \rightleftharpoons 2NH_{3(g)}$ (synthesis of ammonia) (14)
19. Derive K_p and K_c in formation of HI.(12)

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20. Derive K_p and K_c in decomposition of PCl_5 . (13)

21. Deduce the Van't Hoff equation. (20)

ALL THE BEST SCORE CENTUM MARKS

DAY 11 ART 11

UNIT 9 solution

Marks: 50

ANSWER

THE

FOLLOWING

15X2=30

1. Define solution, solute, solvent. (31)
2. Define Molality and Molarity (32)
3. Define Normality and Formality (32)
4. Define Mole fraction and Mass percentage (33)
5. Calculate the mole fraction of methanol and water when 0.5mole of methanol is mixed with 1.5moles of water. (33)
6. Define parts per million (34)
7. What are the advantages of using standard solutions? (35)
8. Draw and explain the graph obtained by plotting solubility versus temperature for calcium chloride. (37)
9. State Henry's law (38)
10. NH_3 and HCl do not obey Henry's law. Why? (38)
11. What are the limitations of Henry's law? (40)
12. State Raoult's law (43)
13. How will you compare Raoult's law with Henry's law? (45)
14. What is osmotic pressure? (55)
15. What is isotonic solution? (56)
16. Define reverse Osmosis (57)
17. What is abnormal molar mass? (58)
18. What is Van't Hoff factor? (58)

ANSWER THE FOLLOWING

4x5=20

19. What are the factors influencing the solubility? (36)

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20. Determination of Molar mass weights from relative lowering of vapour pressure (50)

21. Determination of molar mass of solute from elevation of boiling point (52)

22. Determination of molar mass of solute from depression in freezing point (54)

23. Determination of molar mass from osmotic pressure (56)

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DAY 12 ART 12

UNIT 10 chemical bonding

Marks: 50

Answer the following

4x2=8

1. State octet rule. (69)

2. Define Bond length, bond order. (76)

3. Resonance structure of CO_3^{2-} . (78)

4. What is dipole moment? Dipole moment of water. (79,80)

5. Define Hybridisation. (89)

6. Define σ - bond, pi bond?

Answer the following

4x3=12

7. Explain sp^2 Hybridisation in BF_3 . (91)

8. Draw the Lewis structures for the following species. i) HNO_3 ii) N_2O_5 iii) H_2O (71)

9. Explain the covalent character in ionic bond. (80)

10. Formal charge of CO_2 . (73)

Answer the following in detail 6x5=30

11. Discuss the formation of N_2 molecule using MO Theory. (100)

12. Explain VSEPR theory. (81)

13. Applying this theory to predict the shapes of BeCl_2 , BF_3 , CH_4 , PCl_5 , IF_7 , and SF_6 . (82)

14. Describe Fajan's rule. (81)

15. Explain salient features of VB theory and formation of HF molecule. (86,88)

16. Explain molecular orbital theory. (97)

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DAY 13 ART 13

UNIT 6-10 physical chemistry MODEL Exam

Marks: 50

Answer the following

20x2=40

1. State Le- Chatelier Principle
2. State law of mass action.
3. What is reaction quotient.
4. State Henry's Law
5. Define Bond order
6. Define Hybridisation
7. Define σ - bond
8. What is a pi bond?
9. What is dipole moment?
10. Linear form of carbondioxide molecule has two polar bonds. yet the molecule has Zero dipole moment why?
11. State octet rule.
12. State Raoult Law
13. What is molal depression constant? Does it depend on nature of the solute ?
14. What is osmosis?
15. What are Colligative properties
16. State the first law of thermodynamics.
17. Define Hess's law of constant heat summation.
18. Explain intensive properties with two examples
19. State Boyle's law.
20. State joule Thomson effect.
21. State Graham diffusion law.
22. Apply MO Theory in formation of H_2 .

Answer the following 10x3=30

23. Discuss the formation of N_2 molecule using MO Theory
24. Explain sp^2 hybridisation in BF_3 .
25. Explain salient features of VB theory.
26. Explain VSEPR theory. Applying this theory to predict the shapes of IF_7 , and SF_6
27. Derive the relation between K_p and K_c .
28. Derive a general expression for the equilibrium constant K_p and K_c for the reaction $3H_2(g) + N_2(g) \rightleftharpoons 2NH_3(g)$ (synthesis of ammonia)
29. Derive K_p and K_c in formation of HI
30. Derive K_p and K_c in decomposition of PCl_5

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31. Deduce the Van't Hoff equation.
32. Derivation of critical constants from van der Waals constant.
33. Derive the relation between ΔH and ΔU for an ideal gas.

ALL THE BEST

DAY 14 ART 14 UNIT 11 Fundamentals of organic chemistry

Marks: 50

Answer the following

25x2=50

1. What are characteristics of organic compounds?
2. Define homologous series.
3. How organic compounds are classified.
4. Define isomerism.
5. Define chain isomers. Give an example.
6. Define position isomers. Give an example.
7. Define functional isomers. Give an example.
8. Define metamerism. Give an example.
9. Define tautomerism. Give an example.
10. Define Ring chain isomers. Give an example.
11. Define stereoisomerism.
12. Define geometrical isomerism. Draw 2-butene cis, trans isomerism.
13. Draw oximes and azo compounds cis, trans isomerism.
14. Define optical isomerism. Give an example.
15. What are conditions for enantiomerism.
16. Give the general formula for the following classes of organic compounds
(a) Aliphatic monohydric alcohol (b) Aliphatic ketones. (c) Aliphatic amines.
17. Write the molecular formula of the first six members of homologous series of nitro alkanes.
18. Test for phosphorus.
19. Test for sulphur
20. Test for halogens
21. Steps for crystallization

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22. Define chromatography.
23. Define retention factor.
24. Adsorption chromatography.
25. What is the technique for the separation and purification of organic compounds.

ALL THE BEST SCORE CENTUM MARKS**DAY 15 ART 15****UNIT 11 Fundamentals of organic chemistry****Marks: 50****Answer the following****15x3=45**

1. Explain characteristics of organic compound.
2. Classification of organic compound.
3. Explain structural isomerism
4. Explain geometrical isomerism
5. Explain optical isomerism in lactic acid.
6. Explain test for carbon and hydrogen.
7. Explain estimation of sulphur.
8. Explain estimation of halogens.
9. Explain estimation of carbon and hydrogen.
10. Write note on column chromatography.
11. Write note on Thin layer chromatography.
12. Partition chromatography.
13. Explain crystallization.
14. Write note on steam distillation.
15. Write note on azeotropic distillation.
16. Write structural formula for the following compounds
 - i) m-dinitrobenzene
 - ii) p-dichloro benzene
 - iii) 1,3,5-trimethyl benzene

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DAY 16 ART 16**UNIT 12 Basic concepts of organic reactions****Marks: 50****Answer briefly.****20x2=40**

1. What are organic reactions?
2. What is mechanism of the reaction?
3. Mention the types of fission of a covalent bond?
4. What are free radical initiators?
5. Mention any two examples for free radical initiators?
6. What are carbocations?
7. What are carbanions?
8. Identify which of the following are electrophiles and nucleophiles?
(i) NH_3 (ii) AlCl_3 (iii) R-SH (iv) R-X
9. How will you distinguish between electrophiles and nucleophiles?
10. Identify which of the following shows +I and -I effect? (i) $-\text{NO}_2$ (ii) $-\text{SOH}$ (iii) $-\text{I}$ (iv) $-\text{OH}$
11. Why chloro acetic acid is stronger acid than acetic acid?
12. Explain the positive and negative electromeric effects?
13. What is addition reaction? Give an example.
14. What is elimination reaction? Give an ex.
15. What is organic oxidation reaction? Give EX
16. What are organic reduction reactions? Give Ex
17. Why cut apple turns a brown colour?
18. What are functional group inter conversions?
19. How will you convert alcohol into aldehyde?
20. What happens when nitrile undergoes acid hydrolysis?

Answer the following**5x3=15**

21. How does hyper conjugation effect explain the stability of alkenes?
22. Explain the types of addition reaction?

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23. Explain the types of substitution reaction?
24. An organic compound (A) has a molecular formula C_2H_6O it is one of the primary alcohol. A reacts with acidified potassium dichromate to give B. B on further undergoes to oxidation reaction to give C. Identify A, B and C, explain with equation.
25. An organic compound (A) of a molecular formula C_2H_4 which is a simple alkene. A reacts with dil H_2SO_4 to give B. A again reacts with Cl_2 to give C. Identify A, B and C and write the equations.

ALL THE BEST SCORE CENTUM**DAY 19 ART 19****UNIT 13 Hydrocarbons****Marks: 50****Answer the following 20x2=40**

1. Sabatier sendersens reaction.(184)
2. Decarboxylation of sodium acetate. (184)
3. Wurtz reaction. (184)
4. Corey house mechanism. (185)
5. Preparation of methane from Grignard reagent. (185)
6. Define pyrolysis. Give an example. (189)
7. Uses of alkane.(190)
8. Geometrical isomerism of 2-butene.(191)
9. Write short notes on ortho, para directors in aromatic electrophilic substitution reactions.
10. Describe the mechanism of Nitration of benzene.(214)
11. How does Huckel rule help to decide the aromatic character of a compound. (205)
12. Suggest a simple chemical test to distinguish propane and propene.(bb)(194)
13. What happens when isobutylene is treated with acidified potassium permanganate? (bb)(198)
14. How will you convert ethyl chloride in to
 - i) ethane ii) n – butane (bb) (184)
15. Write the chemical equations for combustion of propane.(bb)
16. Explain Markownikoff's rule with suitable example.(194)
17. What happens when ethylene is passed through cold dilute alkaline potassium permanganate.(197-198)
18. How will you prepare propane from a sodium salt of fatty acid?(bb)
19. Wurtz-Fittig reaction.(210)
20. Fridel crafts reaction. (210)
21. Preparation of BHC. & uses.(215)

Answer the following 2x5=10**E.MUTHUSAMY MSc(ChE), MSc(Psy), MEd., MPhil., MA(Eng), MA(T), MA(PA), MA(Soc), BLISc., DMLT.****B. SARANYA MUTHUSAMY BE., BEd., You Tube: ACTC Educare Whatsapp: 9940847892**

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22. Explain preparation of benzene (3 methods)(207)

23. Electrophilic substitution reaction of benzene

(Nitration, halogenation, Sulphonation, Methylation, Acetylation)(211-212)

24. Explain structure of benzene.(207)

ALL THE BEST SCORE CENTUM MARKS**DAY 20 ART 20 UNIT 14 Haloalkanes and Haloarenes****Marks: 50****Answer the following****14x4=56**

1. Explain the mechanism of SN^1 .
2. Explain the mechanism of E^1 .
3. Explain the mechanism of SN^2 .
4. Explain the mechanism of E^2 .
5. Explain the preparation of ethyl chloride. (5 methods)
6. Explain the preparation of chloro benzene.
7. Explain the preparation of gem di halide, vicinyl halide.
8. Starting from CH_3MgI , How will you prepare the following?
 - i) Acetic acid ii) Acetone iii) Ethyl acetate
 - iv) Iso propyl alcohol v) Methyl cyanide
9. Explain electrophilic substitution reaction of chloro benzene.
10. Write down the possible isomers of $C_5H_{11}Br$ and give their IUPAC and common names.
11. Explain the preparation of the following compounds.
 - i) DDT ii) Chloroform iii) Biphenyl iv) Chloropicrin v) Freon-12
12. An organic compound (A) with molecular formula C_2H_5Cl reacts with KOH gives compounds (B) and with alcoholic KOH gives compound (C). Identify (A), (B) and (C).
13. Simplest alkene (A) reacts with HCl to form compound (B). Compound (B) reacts with ammonia to form compound (C) of molecular formula C_2H_7N . Compound (C) undergoes carbylamine test. Identify (A), (B), and (C).
14. 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) and (C). Explain the reactions.

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DAY 21 ART 21**UNIT 15 Environmental chemistry****Marks: 50****Answer the following****15x2=30**

1. What are biodegradable and non-biodegradable pollutants? (260)
2. What is greenhouse effect? (263)
3. What is global warming? (263)
4. What is acid rain? What are harmful effects of acid rain? (264)
5. What are particulate pollutants? (265)
6. What are the Health effects of particulate pollutants. (265)
7. What is smog? (266)
8. What is classical smog or London smog? (266)
9. What are the effects of classical smog? (267)
10. What is photochemical smog or Los Angel Smog? (267)
11. What are the effects of photochemical smog? (268)
12. What is depletion of ozone layer or ozone hole? (268)
13. Define Eutrophication (271)
14. What is Biochemical oxygen demand (BOD)? (271)
15. What is chemical oxygen demand (COD)? (271)
16. Mention the standards prescribed by BIS for qualities of drinking water. (272)
17. What are the total dissolved solids (TDS)? (273)

Answer the following**4x5=20**

18. Explain the strategies to control environmental pollution (274)
19. What is Green Chemistry? Green chemistry in day-to-day life. (275)

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20. What is meant by water pollution? What are the causes, harmful effects of chemical water pollution. (271)
21. Define soil pollution. What are the sources of soil pollution. (273)

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DAY 22 ART 22 ORGANIC NAME REACTION

Marks: 50

1. Sabatier sendersens reaction.(184)
2. Kolbe's electrolytic method. Alkane(184)
3. Wurtz reaction (184)
4. Corey house reaction. (185)
5. Grignard reagent preparation. (185)
6. Aromatization (189)
7. Pyrolysis (189)
8. Markonikoff's rule. (194 & 231)
9. Anti -markonvnikoff's rule or peroxide effect or kharasch addition. (196)
10. Action of bayer reagent(197)
11. Ozonolysis (198)
12. Polymerization (199)
13. Wurtz- fittig reaction (210 & 244)
14. Friedel crafts reaction (210)
15. Friedel crafts reaction acylation (212)
16. BHC (215)
17. Brich reduction(215)
18. Lucas test (230)
19. Dorzens halogenation reaction
20. Finkelstein reaction (231)
21. Swarts reaction (231 & 249)
22. Hunsidiccker reaction (231)
23. Williamson ether synthesis. (234)
24. TEL (238)
25. Sandmeyer reaction.(242)
26. Gattermann reaction (242)
27. Balz schiemann reaction (242)
28. Raschig process. (242)
29. Dow process. (243)
30. Fittig reaction(244)
31. Haloform reaction(247)
32. Chloropicrin (248)

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33. Carbylamine reaction (248)
34. Freons (249)
35. DDT (250)

ALL THE BEST SCORE CENTUM MARKS**DAY 23 ART 23****INORGANIC CHEMISTRY UNIT 1-5****Marks: 50****I. Choose the best answer.**

1. An element X has the following isotopic composition $^{200}\text{X} = 90\%$, $^{199}\text{X} = 8\%$ and $^{202}\text{X} = 2\%$. The weighted average atomic mass of the element X is closest to
(a) 201 u (b) 202 u (c) 199 u (d) 200 u
2. Assertion: Two mole of glucose contains 12.044×10^{23} molecules of glucose
Reason: Total number of entities present in one mole of any substance is equal to 6.02×10^{22}
(a) both assertion and reason are true and the 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
3. The equivalent mass of a trivalent metal element is 9 g eq^{-1} the molar mass of its anhydrous oxide is
(a) 102 g (b) 27 g (c) 270 g (d) 78 g
4. The number of water molecules in a drop of water weighing 0.018 g is
(a) 6.022×10^{26} (b) 6.022×10^{23} (c) 6.022×10^{20} (d) 9.9×10^{22}
5. Choose the disproportionation reaction among the following redox reactions.
(a) $3\text{Mg (s)} + \text{N}_2\text{(g)} \rightarrow \text{Mg}_3\text{N}_2\text{(s)}$
(b) $\text{P}_4\text{(s)} + 3\text{NaOH} + 3\text{H}_2\text{O} \rightarrow \text{PH}_3\text{(g)} + 3\text{NaH}_2\text{PO}_2\text{(aq)}$
(c) $\text{Cl}_2\text{(g)} + 2\text{KI(aq)} \rightarrow 2\text{KCl(aq)} + \text{I}_2$
(d) $\text{Cr}_2\text{O}_3\text{(s)} + 2\text{Al (s)} \rightarrow \text{Al}_2\text{O}_3\text{(s)} + 2\text{Cr(s)}$
6. The equivalent mass of potassium permanganate in alkaline medium is
 $\text{MnO}_4^- + 2\text{H}_2\text{O} + 3\text{e}^- \rightarrow \text{MnO}_2 + 4\text{OH}^-$
(a) 31.6 (b) 52.7 (c) 79 (d) None of these
7. What is the mass of precipitate formed when 50 ml of 8.5 % solution of AgNO_3 is mixed with 100 ml of 1.865 % potassium chloride solution?
(a) 3.59 g (b) 7 g (c) 14 g (d) 28 g
8. The mass of a gas that occupies a volume of 612.5 ml at room temperature and pressure (250 °C and 1 atm pressure) is 1.1g. The molar mass of the gas is
(a) 66.25 g mol^{-1} (b) 44 g mol^{-1} (c) 24.5 g mol^{-1} (d) 662.5 g mol^{-1}
9. Which of the following contain same number of carbon atoms as in 6 g of carbon-12.
(a) 7.5 g ethane (b) 8 g methane (c) both (a) and (b) (d) none of these
10. Which of the following compound(s) has /have percentage of carbon same as that in ethylene (C_2H_4)
(a) propene (b) ethyne (c) benzene (d) ethane
11. Which one of the following is used as a standard for atomic mass.

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- (a) ${}_6\text{C}^{12}$ (b) ${}_7\text{C}^{12}$ (c) ${}_6\text{C}^{13}$ (d) ${}_6\text{C}^{14}$
12. Electronic configuration of species M^{2+} is $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$ and its atomic weight is 56. The number of neutrons in the nucleus of species M is
 a) 26 b) 22 c) 30 d) 24
13. Splitting of spectral lines in an electric field is called
 a) Zeeman effect b) Shielding effect c) Compton effect d) Stark effect
14. Assertion: The spectrum of He^+ is expected to be similar to that of hydrogen.
 Reason: He^+ is also one electron system.
 (a) If both assertion and reason are true and reason is the correct explanation of assertion.
 (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 (c) If assertion is true but reason is false (d) If both assertion and reason are false
15. The maximum number of electrons in a sub shell is given by the expression
 a) $2n^2$ b) $2l + 1$ c) $4l + 2$ d) none of these
16. Assertion: Number of radial and angular nodes for 3p orbital are 1, 1 respectively.
 Reason: Number of radial and angular nodes depends only on principal quantum number.
 (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
17. The total number of orbitals associated with the principal quantum number $n = 3$ is
 a) 9 b) 8 c) 5 d) 7
18. Consider the following sets of quantum numbers :
- | n | l | m | s |
|---------|---|----|----------------|
| (i) 3 | 0 | 0 | $+\frac{1}{2}$ |
| (ii) 2 | 2 | 1 | $-\frac{1}{2}$ |
| (iii) 4 | 3 | -2 | $+\frac{1}{2}$ |
| (iv) 1 | 0 | -1 | $+\frac{1}{2}$ |
| (v) 3 | 4 | 3 | $-\frac{1}{2}$ |
- Which of the following sets of quantum number is not possible ?
 a) (i), (ii), (iii) and (iv) b) (ii), (iv) and (v) c) (i) and (iii) d) (ii), (iii) and (iv)
19. How many electrons in an atom with atomic number 105 can have $(n + l) = 8$?
 a) 30 b) 17 c) 15 d) unpredictable
20. Which of the following does not represent the mathematical expression for the Heisenberg uncertainty principle?
 a) $\Delta x \cdot \Delta p \geq \frac{h}{4\pi}$ b) $\Delta x \cdot \Delta v \geq \frac{h}{4\pi m}$ c) $\Delta E \cdot \Delta t \geq \frac{h}{4\pi}$ d) $\Delta E \cdot \Delta x \geq \frac{h}{4\pi}$
21. What would be the IUPAC name for an element with atomic number 222?
 a) bibibium b) bididium c) didibium d) bibibium
22. Which of the following elements will have the highest electronegativity?
 a) Chlorine b) Nitrogen c) Cesium d) Fluorine
23. In the third period the first ionization potential is of the order.
 a) $\text{Na} > \text{Al} > \text{Mg} > \text{Si} > \text{P}$ b) $\text{Na} < \text{Al} < \text{Mg} < \text{Si} < \text{P}$
 c) $\text{Mg} > \text{Na} > \text{Si} > \text{P} > \text{Al}$ d) $\text{Na} < \text{Al} < \text{Mg} < \text{Si} < \text{P}$

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24. Which one of the following arrangements represent the correct order of least negative to most negative electron gain enthalpy
 a) $\text{Al} < \text{O} < \text{C} < \text{Ca} < \text{F}$ b) $\text{Al} < \text{Ca} < \text{O} < \text{C} < \text{F}$
 c) $\text{C} < \text{F} < \text{O} < \text{Al} < \text{Ca}$ d) $\text{Ca} < \text{Al} < \text{C} < \text{O} < \text{F}$
25. 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 but the reason is not the correct explanation for the assertion
 c) Assertion is true and the reason is false d) Both assertion and the reason are false
26. The electronic configuration of the atom having maximum difference in first and second ionization energies is
 a) $1s^2, 2s^2, 2p^6, 3s^1$ b) $1s^2, 2s^2, 2p^6, 3s^2$
 c) $1s^2, 2s^2, 2p^6, 3s^2, 3s^2, 3p^6, 4s^1$ d) $1s^2, 2s^2, 2p^6, 3s^2, 3p^1$
27. Which of the following is second most electronegative element?
 a) Chlorine b) Fluorine c) Oxygen d) Sulphur
28. Which of the following orders of ionic radii is correct?
 a) $\text{H}^- > \text{H}^+ > \text{H}$ b) $\text{Na}^+ > \text{F}^- > \text{O}^{2-}$ c) $\text{F}^- > \text{O}^{2-} > \text{Na}^+$ d) None of these
29. How does electron affinity change when we move from left to right in a period in the periodic table?
 a) Generally increases b) Generally decreases
 c) Remains unchanged d) First increases and then decreases
30. Which of the following pairs of elements exhibit diagonal relationship?
 a) Be and Mg b) Li and Mg c) Be and B d) Be and Al
31. Which of the following statements about hydrogen is incorrect ? (NEET - 2016)
 a) Hydrogen ion, H_3O^+ exists freely in solution. b) Dihydrogen acts as a reducing agent.
 c) Hydrogen has three isotopes of which tritium is the most common.
 d) Hydrogen never acts as cation in ionic salts.
32. Water gas is
 a) $\text{H}_2\text{O}_{(g)}$ b) $\text{CO} + \text{H}_2\text{O}$ c) $\text{CO} + \text{H}_2$ d) $\text{CO} + \text{N}_2$
33. Ionic hydrides are formed by
 a) halogens b) chalogens c) inert gases d) group one elements
34. Tritium nucleus contains
 a) $1p + 0n$ b) $2p + 1n$ c) $1p + 2n$ d) none of these
35. 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
36. The hardness of water can be determined by volumetrically using the reagent

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- a) sodium thio sulphate b) potassium permanganate c) hydrogen peroxide d) EDTA
37. The cause of permanent hardness of water is due to
a) $\text{Ca}(\text{HCO}_3)_2$ b) $\text{Mg}(\text{HCO}_3)_2$ c) CaCl_2 d) MgCO_3
38. Zeolite used to soften hardness of water is, hydrated
a) Sodium aluminium silicate b) Calcium aluminium silicate
c) Zinc aluminium borate d) Lithium aluminium hydride
39. Heavy water is used as
a) modulator in nuclear reactions b) coolant in nuclear reactions c) both (a) and (b) d) none of these
40. Water is a
a) basic oxide b) acidic oxide c) amphoteric oxide d) none of these
41. Sodium is stored in
a) alcohol b) water c) kerosene d) none of these
42. RbO_2 is
a) superoxide and paramagnetic b) peroxide and diamagnetic
c) superoxide and diamagnetic d) peroxide and paramagnetic
43. Find the wrong statement
a) sodium metal is used in organic qualitative analysis
b) sodium carbonate is soluble in water and it is used in inorganic qualitative analysis
c) potassium carbonate can be prepared by solvay process
d) potassium bicarbonate is acidic salt
44. Match the flame colours of the alkali and alkaline earth metal salts in the Bunsen burner
(p) Sodium (1) Brick red
(q) Calcium (2) Yellow
(r) Barium (3) Violet
(s) Strontium (4) Apple green
(t) Cesium (5) Crimson red
(u) Potassium (6) Blue
a) p - 2, q - 1, r - 4, s - 5, t - 6, u - 3
b) p - 1, q - 2, r - 4, s - 5, t - 6, u - 3
c) p - 4, q - 1, r - 2, s - 3, t - 5, u - 6
d) p - 6, q - 5, r - 4, s - 3, t - 1, u - 2
45. Assertion: Generally alkali and alkaline earth metals form superoxides
Reason: There is a single bond between O and O in superoxides.
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
46. Assertion: BeSO_4 is soluble in water while BaSO_4 is not
Reason: Hydration energy decreases down the group from Be to Ba and lattice energy remains almost constant.
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

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- c) assertion is true but reason is false d) both assertion and reason are false
47. The suspension of slaked lime in water is known as (NEET Phase - II)
 a) lime water b) quick lime c) milk of lime d) aqueous solution of slaked lime
48. The name 'Blue John' is given to which of the following compounds ?
 a) CaH_2 b) CaF_2 c) $\text{Ca}_3(\text{PO}_4)_2$ d) CaO
49. Formula of Gypsum is
 a) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ b) $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$ c) $3\text{CaSO}_4 \cdot \text{H}_2\text{O}$ d) $2\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
50. Among the following the least thermally stable is
 (a) K_2CO_3 b) Na_2CO_3 (c) BaCO_3 d) Li_2CO_3

ALL THE BEST SCORE CENTUM MARKS**DAY 24 ART 24****PHYSICAL CHEMISTRY UNIT 6-10****Marks: 50****CHOOSE****THE****CORRECT****ANSWER****50x1=50**

- Gases deviate from ideal behavior at high pressure. Which of the following statement(s) is correct for non-ideality?
 a) at high pressure the collision between the gas molecule become enormous
 b) at high pressure the gas molecules move only in one direction
 c) at high pressure, the volume of gas become insignificant
 d) at high pressure the intermolecular interactions become significant
- Rate of diffusion of a gas is
 a) directly proportional to its density
 b) directly proportional to its molecular weight
 c) directly proportional to its square root of its molecular weight
 d) inversely proportional to the square root of its molecular weight
- Which of the following is the correct expression for the equation of state of van der Waals gas?
 a) $\left[P + \frac{a}{n^2v^2}\right] (V - nb) = nRT$ b) $\left[P + \frac{na}{n^2v^2}\right] (V - nb) = nRT$
 c) $\left[P + \frac{an^2}{v^2}\right] (V - nb) = nRT$ d) $\left[P + \frac{n^2a^2}{v^2}\right] (V - nb) = nRT$
- The temperatures at which real gases obey the ideal gas laws over a wide range of pressure is called
 a) Critical temperature b) Boyle temperature
 c) Inversion temperature d) Reduced temperature
- In a closed room of 1000 m^3 a perfume bottle is opened up. The room develops a smell. This is due to which property of gases?
 a) Viscosity b) Density c) Diffusion d) None
- The value of the gas constant R is
 a) $0.082\text{ dm}^3\text{ atm}$ b) $0.987\text{ cal mol}^{-1}\text{ K}^{-1}$ c) $8.3\text{ J mol}^{-1}\text{ K}^{-1}$ d) $8\text{ erg mol}^{-1}\text{ K}^{-1}$
- Use of hot air balloon in sports at meteorological observation is an application of
 a) Boyle's law b) Newton's law c) Kelvin's law d) Brown's law
- Consider the following statements
 i) Atmospheric pressure is less at the top of a mountain than at sea level

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Kindly send me your answer keys to us - padasalai.net@gmail.com

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ii) Gases are much more compressible than solids or liquids

iii) When the atmospheric pressure increases the height of the mercury column rises

Select the correct statement

- a) I and II b) II and III c) I and III d) I, II and III

9. Compressibility factor for CO_2 at 400 K and 71.0 bar is 0.8697. The molar volume of CO_2 under these conditions is

- a) 22.04 dm^3 b) 2.24 dm^3 c) 0.41 dm^3 d) 19.5 dm^3

10. Assertion: Critical temperature of CO_2 is 304K, it can be liquefied above 304K.

Reason: For a given mass of gas, volume is directly proportional to pressure at constant temperature

- 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

11. The amount of heat exchanged with the surrounding at constant temperature and pressure is given by the quantity

- a) ΔE b) ΔH c) ΔS d) ΔG

12. All the naturally occurring processes proceed spontaneously in a direction which leads to

- a) decrease in entropy b) increase in enthalpy c) increase in free energy d) decrease in free energy

13. In an adiabatic process, which of the following is true?

- a) $q = w$ b) $q = 0$ c) $\Delta E = q$ d) $P \Delta V = 0$

14. Which of the following is not a thermodynamic function?

- a) internal energy b) enthalpy c) entropy d) frictional energy

15. Change in internal energy, when 4 kJ of work is done on the system and 1 kJ of heat is given out by the system is

- a) +1 kJ b) -5 kJ c) +3 kJ d) -3 kJ

16. The work done by the liberated gas when 55.85 g of iron (molar mass 55.85 g mol^{-1}) reacts with hydrochloric acid in an open beaker at 250 C

- a) -2.48 kJ b) -2.22 kJ c) +2.22 kJ d) +2.48 kJ

17. The value of ΔH for cooling 2 moles of an ideal monatomic gas from 125°C to 25°C at constant pressure will be $\left[\text{given } C_p = \frac{5}{2} R \right]$

- a) -250 R b) -500 R c) 500 R d) +250 R

18. The correct thermodynamic conditions for the spontaneous reaction at all temperature is (NEET Phase - I)

- 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 $\Delta S > 0$

19. The temperature of the system, decreases in an _____

- a) Isothermal expansion b) Isothermal Compression
c) adiabatic expansion d) adiabatic compression

20. In an isothermal reversible compression of an ideal gas the sign of q , ΔS and w are respectively

- a) +, -, - b) -, +, - c) +, -, + d) -, -, +

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21. If K_b and K_f for a reversible reactions are 0.8×10^{-5} and 1.6×10^{-4} respectively, the value of the equilibrium constant is,
 a) 20 b) 0.2×10^{-1} c) 0.05 d) none of these
22. The equilibrium constant for a reaction at room temperature is K_1 and that at 700 K is K_2 . If $K_1 > K_2$, then
 a) The forward reaction is exothermic b) The forward reaction is endothermic
 c) The reaction does not attain equilibrium d) The reverse reaction is exothermic
23. In the equilibrium, $2A(g) \rightleftharpoons 2B(g) + C_2(g)$ the equilibrium concentrations of A, B and C_2 at 400 K are 1×10^{-4} M, 2.0×10^{-3} M, 1.5×10^{-4} M respectively. The value of K_C for the equilibrium at 400 K is
 a) 0.06 b) 0.09 c) 0.62 d) 3×10^{-2}
24. An equilibrium constant of 3.2×10^{-6} for a reaction means, the equilibrium is
 a) largely towards forward direction b) largely towards reverse direction
 c) never established d) none of these
25. $\frac{K_C}{K_P}$ for the reaction, $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ is
 a) $\frac{1}{RT}$ b) \sqrt{RT} c) RT d) $(RT)^2$
26. In the reaction, $Fe(OH)_3(s) \rightleftharpoons Fe^{3+}(aq) + 3OH^-(aq)$, if the concentration of OH^- ions is decreased by . times, then the equilibrium concentration of Fe^{3+} will
 a) not changed b) also decreased by times c) increase by 4 times d) increase by 64 times
27. 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}
28. Which of the following is not a general characteristic of equilibrium involving physical process
 a) Equilibrium is possible only in a closed system at a given temperature
 b) The opposing processes occur at the same rate and there is a dynamic but stable condition
 c) All the physical processes stop at equilibrium
 d) All measurable properties of the system remains constant
29. Consider the following reversible reaction at equilibrium, $A + B \rightleftharpoons C$, If the concentration of the reactants A and B are doubled, then the equilibrium constant will
 a) be doubled b) become one fourth c) be halved d) remain the same
30. A 20 litre container at 400 K contains $CO_2(g)$ at pressure 0.4 atm and an excess of SrO (neglect the volume of solid SrO). The volume of the container is now decreased by moving the movable piston fitted in the container. The maximum volume of the container, when pressure of CO_2 attains its maximum value will be : Given that : $SrCO_3(S) \rightleftharpoons SrO(S) + CO_2(g)$ $K_P = 1.6$ atm (NEET 2017)
 a) 2 litre b) 5 litre c) 10 litre d) 4 litre
31. The molality of a solution containing 1.8g of glucose dissolved in 250g of water is
 a) 0.2 M b) 0.01 M c) 0.02 M d) 0.04 M
32. Which of the following concentration terms is / are independent of temperature

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- a) molality b) molarity c) mole fraction d) (a) and (c)
33. Stomach acid, a dilute solution of HCl can be neutralised by reaction with Aluminium hydroxide $\text{Al}(\text{OH})_3 + 3\text{HCl}(\text{aq}) \rightarrow \text{AlCl}_3 + 3\text{H}_2\text{O}$ How many millilitres of 0.1 M $\text{Al}(\text{OH})_3$ solution are needed to neutralise 21 mL of 0.1 M HCl ?
 a) 14 mL b) 7 mL c) 21 mL d) none of these
34. The Henry's law constant for the solubility of Nitrogen gas in water at 350 K is 8×10^4 atm. The mole fraction of nitrogen in air is 0.5. The number of moles of Nitrogen from air dissolved in 10 moles of water at 350K and 4 atm pressure is
 a) 4×10^{-4} b) 4×10^4 c) 2×10^{-2} d) 2.5×10^{-4}
35. Which one of the following gases has the lowest value of Henry's law constant ?
 a) N_2 b) He c) CO_2 d) H_2
36. Osmotic pressure (p) of a solution is given by the relation
 a) $p = nRT$ b) $pV = nRT$ c) $pRT = n$ d) none of these
37. Which one of the following binary liquid mixtures exhibits positive deviation from Raoult's law ?
 a) Acetone + chloroform b) Water + nitric acid c) HCl + water d) ethanol + water
38. Normality of 1.25M sulphuric acid is
 a) 1.25 N b) 3.75 N c) 2.5 N d) 2.25 N
39. Two liquids X and Y on mixing gives a warm solution. The solution is
 a) ideal b) non-ideal and shows positive deviation from Raoult's law
 c) ideal and shows negative deviation from Raoult's Law
 d) non-ideal and shows negative deviation from Raoult's Law
40. The Van't Hoff factor (i) for a dilute aqueous solution of the strong electrolyte barium hydroxide is (NEET)
 a) 0 b) 1 c) 2 d) 3
41. Assertion : An ideal solution obeys Raoult's Law Reason : In an ideal solution, solvent-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
42. In which of the following Compounds does the central atom obey the octet rule?
 a) XeF_4 b) AlCl_3 c) SF_6 d) SCl_2
43. The ratio of number of sigma (σ) and pi (π) bonds in 2-butyne is
 a) 8/3 b) 5/3 c) 8/2 d) 9/2
44. Which one of the following is the likely bond angles of sulphur tetrafluoride molecule?
 a) $120^\circ, 80^\circ$ b) $109^\circ.28'$ c) 90° d) $89^\circ, 117^\circ$
45. **Assertion:** Oxygen molecule is paramagnetic.
Reason: It has two unpaired electron 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 assertion
 c) assertion is true but reason is false d) Both assertion and reason are false

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46. According to Valence bond theory, a bond between two atoms is formed when
 a) fully filled atomic orbitals overlap b) half-filled atomic orbitals overlap
 c) non-bonding atomic orbitals overlap d) empty atomic orbitals overlap
47. Which one of the following is diamagnetic?
 a) O_2 b) O_2^{2-} c) O_2^+ d) None of these
48. Bond order of a species is 2.5 and the number of electrons in its bonding molecular orbital is found to be 8. The no. of electrons in its antibonding molecular orbital is
 a) three b) four c) Zero d) can not be calculated from the given information.
49. Shape and hybridisation of IF_5 are
 a) Trigonal bipyramidal, sp^3d^2 b) Trigonal bipyramidal, sp^3d c) Square pyramidal, sp^3d^2
 d) Octahedral, sp^3d^2
50. Non-Zero dipole moment is shown by
 a) CO_2 b) p-dichlorobenzene c) carbon tetrachloride d) water.

ALL THE BEST SCORE CENTUM MARKS**DAY 25 ART 25****ORGANIC CHEMISTRY LESSON 11-15****Marks: 50****Choose the correct answer****50x1=50**

- Which one of the following names does not fit a real name?
 a) 3-Methyl-3-hexanone b) 4-Methyl-3-hexanone
 c) 3-Methyl-3-hexanol d) 2-Methylcyclohexanone.
- The number of stereoisomers of 1, 2-dihydroxycyclopentane
 a) 1 b) 2 c) 3 d) 4
- Which of the following is optically active?
 a) 3-Chloropentane b) 2-Chloropropane c) Meso-tartaric acid d) Glucose
- The isomer of ethanol is
 a) acetaldehyde b) dimethylether c) acetone d) methyl carbinol
- How many cyclic and acyclic isomers are possible for the molecular formula C_3H_6O ?
 a) 4 b) 5 c) 9 d) 10
- Which one of the following shows functional isomerism?
 a) ethylene b) Propane c) ethanol d) CH_2Cl_2
- Nitrogen detection in an organic compound is carried out by Lassaigne's test. The blue colour formed is due to the formation of.
 a) $Fe_3[Fe(CN)_6]_2$ b) $Fe_4[Fe(CN)_6]_3$ c) $Fe_4[Fe(CN)_6]_2$ d) $Fe_3[Fe(CN)_6]_3$
- Lassaigne's test for the detection of nitrogen fails in
 a) $H_2N-CO-NH.NH_2.HCl$ b) $NH_2-NH_2.HCl$ c) $C_6H_5-NH-NH_2.HCl$ d) $C_6H_5CONH_2$
- Sodium nitroprusside reacts with sulphide ion to give a purple colour due to the formation of
 a) $[Fe(CN)_5NO]^{3-}$ b) $[Fe(NO)_5CN]^+$ c) $[Fe(CN)_5NOS]^{4-}$ d) $[Fe(CN)_5NOS]^{3-}$
- An organic compound weighing 0.15g gave on carius estimation, 0.12g of silver bromide. The percentage of bromine in the compound will be close to
 a) 46% b) 34% c) 3.4% d) 4.6%
- In an organic compound, phosphorus is estimated as
 a) $Mg_2P_2O_7$ b) $Mg_3(PO_4)_2$ c) H_3PO_4 d) P_2O_5

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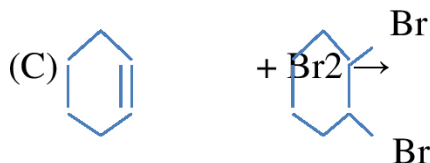
12. Ortho and para-nitro phenol can be separated by
 a) azeotropic distillation b) destructive distillation c) steam distillation d) cannot be separated
13. The purity of an organic compound is determined by
 a) Chromatography b) Crystallization c) melting or boiling point d) both (a) and (c)
14. Assertion: $\text{CH}_3 - \text{C} = \text{CH} - \text{COOH}$ is



3- carbethoxy -2- butenoic acid.

Reason: The principal functional group gets lowest number followed by double bond (or) triple bond.

- (a) both the assertion and reason are true and the reason is the correct explanation of assertion.
 (b) both assertion and reason are true and the reason is not the correct explanation of assertion.
 (c) assertion is true but reason is false (d) both the assertion and reason are false.
15. For the following reactions
 (A) $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br} + \text{KOH} \rightarrow \text{CH}_2 = \text{CH}_2 + \text{KBr} + \text{H}_2\text{O}$
 (B) $(\text{CH}_3)_3\text{CBr} + \text{KOH} \rightarrow (\text{CH}_3)_3\text{COH} + \text{KBr}$



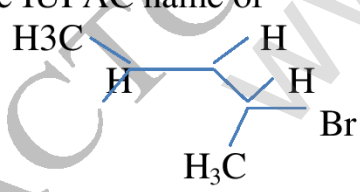
Which of the following statement is correct?

- (a) (A) is elimination, (B) and (C) are substitution
 (b) (A) is substitution, (B) and (C) are elimination
 (c) (A) and (B) are elimination and (C) is addition reaction
 (d) (A) is elimination, B is substitution and (C) is addition reaction.
16. What is the hybridisation state of benzyl carbonium ion?
 (a) sp^2 (b) sp^d (c) sp^3 (d) sp^2d
17. Decreasing order of nucleophilicity is
 (a) $\text{OH}^- > \text{NH}_2^- > ^-\text{OCH}_3 > \text{RNH}_2$ (b) $\text{NH}_2^- > \text{OH}^- > ^-\text{OCH}_3 > \text{RNH}_2$
 (c) $\text{NH}_2^- > \text{CH}_3\text{O}^- > \text{OH}^- > \text{RNH}_2$ (d) $\text{CH}_3\text{O}^- > \text{NH}_2^- > \text{OH}^- > \text{RNH}_2$
18. Which of the following species is not electrophilic in nature?
 (a) Cl^+ (b) BH_3 (c) H_3O^+ (d) $^+\text{NO}_2$
19. **Assertion:** Tertiary Carbocations are generally formed more easily than primary Carbocations ions. **Reason:** Hyper conjugation as well as inductive effect due to additional alkyl group stabilize tertiary carbonium ions
 (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
20. The geometrical shape of carbocation is
 (a) Linear (b) tetrahedral (c) Planar (d) Pyramidal
21. The correct statement regarding the comparison of staggered and eclipsed conformations of ethane, is (NEET)

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- a) the eclipsed conformation of ethane is more stable than staggered conformation even though the eclipsed conformation has torsional strain.
- b) the staggered conformation of ethane is more stable than eclipsed conformation, because staggered conformation has no torsional strain.
- c) the staggered conformation of ethane is less stable than eclipsed conformation, because staggered conformation has torsional strain.
- d) the staggered conformation of ethane is less stable than eclipsed conformation, because staggered conformation has no torsional strain.
22. $\text{C}_2\text{H}_5\text{Br} + 2\text{Na} \xrightarrow{\text{dry ether}} \text{C}_4\text{H}_{10} + 2\text{NaBr}$ The above reaction is an example of which of the following
- a) Reimer Tiemann reaction b) Wurtz reaction c) Aldol condensation d) Hoffmann reaction
23. The C – H bond and C – C bond in ethane are formed by which of the following types of overlap
- a) $\text{sp}^3 - \text{s}$ and $\text{sp}^3 - \text{sp}^3$ b) $\text{sp}^2 - \text{s}$ and $\text{sp}^2 - \text{sp}^2$ c) $\text{sp} - \text{sp}$ and $\text{sp} - \text{sp}$ d) $\text{p} - \text{s}$ and $\text{p} - \text{p}$
24. Which of the following is optically active
- a) 2 – methyl pentane b) citric acid c) Glycerol d) none of these
25. The compounds formed at anode in the electrolysis of an aqueous solution of potassium acetate are
- a) CH_4 and H_2 b) CH_4 and CO_2 c) C_2H_6 and CO_2 d) C_2H_4 and Cl_2
26. The general formula for cyclo alkanes
- a) C_nH_n b) C_nH_{2n} c) $\text{C}_n\text{H}_{2n-2}$ d) $\text{C}_n\text{H}_{2n+2}$
27. The compound that will react most readily with gaseous bromine has the formula (NEET)
- a) C_3H_6 b) C_2H_2 c) C_4H_{10} d) C_2H_4
28. Consider the nitration of benzene using mixed con H_2SO_4 and HNO_3 if a large quantity of KHSO_4 is added to the mixture, the rate of nitration will be
- a) unchanged b) doubled c) faster d) slower
29. Which of the following compounds will not undergo Friedel – crafts reaction easily ? (NEET)
- a) Nitro benzene b) Toluene c) Cumene d) Xylene
30. Some meta-directing substituents in aromatic substitution are given. Which one is most deactivating ?
- a) $-\text{COOH}$ b) $-\text{NO}_2$ c) $-\text{C} \equiv \text{N}$ d) $-\text{SO}_3\text{H}$
31. The IUPAC name of
- 
- a) 2-Bromo pent – 3 – ene b) 4-Bromo pent – 2 – ene
- c) 2-Bromo pent – 4 – ene d) 4-Bromo pent – 1 – ene
32. Of the following compounds, which has the highest boiling point?
- a) n-Butyl chloride b) Isobutyl chloride c) t-Butyl chloride d) n-propyl chloride
33. Arrange the following compounds in increasing order of their density
- A) CCl_4 B) CHCl_3 C) CH_2Cl_2 D) CH_3Cl

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- a) $D < C < B < A$ b) $C > B > A > D$ c) $A < B < C < D$ d) $C > A > B > D$
34. With respect to the position of $-Cl$ in the compound $CH_3 - CH = CH - CH_2 - Cl$, it is classified as
 a) Vinyl b) Allyl c) Secondary d) Aralkyl
35. What should be the correct IUPAC name of diethyl chloromethane?
 a) 3 - Chloro pentane b) 1-Chloropentane
 c) 1-Chloro-1, 1, diethyl methane d) 1 -Chloro-1-ethyl propane
36. C -X bond is strongest in
 a) Chloromethane b) Iodomethane c) Bromomethane d) Fluoromethane
37. Benzene reacts with Cl_2 in the presence of $FeCl_3$ and in absence of sunlight to form
 a) Chlorobenzene b) Benzyl chloride c) Benzal chloride d) Benzene hexachloride
38. **Assertion:** In mono haloarenes, electrophilic substitution occurs at ortho and para positions.
Reason: Halogen atom is a ring deactivator
 (i) If both assertion and reason are true and reason is the correct explanation of assertion.
 (ii) If both assertion and reason are true but reason is not the correct explanation of assertion.
 (iii) If assertion is true but reason is false. (iv) If both assertion and reason are false.
39. Consider the reaction, $CH_3CH_2CH_2Br + NaCN \rightarrow CH_3CH_2CH_2CN + NaBr$ This reaction will be the fastest in
 a) ethanol b) methanol c) DMF (N, N' - dimethyl formamide) d) water
40. Silverpropionate when refluxed with Bromine in carbon tetrachloride gives
 a) propionic acid b) chloro ethane c) bromo ethane d) chloro propane
41. The gaseous envelope around the earth is known as atmosphere. The region lying between altitudes of 1-50 km is _____
 a) Troposphere b) Mesosphere c) Thermosphere d) stratosphere
42. Which of the following is natural and human disturbance in ecology?
 a) Forest fire b) Floods c) Acid rain d) Green house effect
43. Bhopal Gas Tragedy is a case of _____
 a) thermal pollution b) air pollution c) nuclear pollution d) land pollution
44. Haemoglobin of the blood forms carboxy haemoglobin with
 a) Carbon dioxide b) Carbon tetra chloride c) Carbon monoxide d) Carbonic acid
45. Which sequence for greenhouse gases is based on GWP?
 a) $CFC > N_2O > CO_2 > CH_4$ b) $CFC > CO_2 > N_2O > CH_4$
 c) $CFC > N_2O > CH_4 > CO_2$ d) $CFC > CH_4 > N_2O > CO_2$
46. 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
47. The pH of normal rain water is
 a) 6.5 b) 7.5 c) 5.6 d) 4.6
48. Ozone depletion will cause
 a) forest fires b) eutrophication c) bio magnification d) global warming

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49. Release of oxides of nitrogen and hydrocarbons into the atmosphere by motor vehicles is prevented by using _____
- a) grit chamber b) scrubbers c) trickling filters d) catalytic convertors
50. Biochemical oxygen Demand value less than 5 ppm indicates a water sample to be
- a) highly polluted b) poor in dissolved oxygen c) rich in dissolved oxygen d) low COD

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DAY 26 ART 26 +1 CHEMISTRY MODEL EXAM FULL PORTION Marks: 50

PART-I Choose the correct answer

15x1=15

- 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 false.
b) Both assertion and reason are true and the reason is correct explanation for the assertion.
c) Both assertion and reason are true but the reason is not the correct explanation for the assertion.
d) Assertion is true and reason is false.
- Which of the following is electron deficient?
a) NH_3 b) PH_3 c) $(\text{CH}_3)_2$ d) BH_3
- Osmotic pressure (π) of a solution is given by the relation
a) $\pi RT = n$ b) $\pi = nrt$ c) $\pi V = nRT$ d) None of these
- Formula of Gypsum is
a) CaSO_4 b) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ c) $\text{CaSO}_4 \cdot 1/2 \text{H}_2\text{O}$ d) $\text{CaSO}_4 \cdot \text{H}_2\text{O}$
- n-propyl bromide on reaction with alcoholic KOH gives:
a) Butyl alcohol b) Propene c) Butene d) Propyl alcohol
- The maximum number of electrons that can be accommodated in L orbit is :
a) 8 b) 2 c) 4 d) 6
- The relative molecular mass of ethanol is:
a) 0.46g b) 4.6g c) 460g d) 46g
- Cold dilute alkaline KMnO_4 is known as:
a) Schiff's reagent b) Fenton's reagent c) Tollen's reagent d) Baeyer's reagent
- Write the IUPAC name of $\text{CH}_3\text{-CH}_2\text{-CH(OH)-CHO}$
a) 1-formyl propanol b) 1-hydroxy butanal c) 2-hydroxy butanal d) 3-hydroxy butanal
- Ozone depletion will cause:
a) Global warming b) Forest fire c) Eutrophication d) Bio-magnification
- Which of the following is incorrect statement?
a) Equilibrium constant varies with temperature.

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- b) For a system at equilibrium, Q is always less than the equilibrium constant.
 c) Equilibrium can be attained from either side of the reaction.
 d) Presence of catalyst affects both the forward reaction and reverse reaction to the same extent.

12) Intra molecular hydrogen bonding is present in:

- a) Ortho-nitro phenol b) Ice c) Water d) Hydrogen fluoride

13) Gases tend to behave ideally only at:

- a) Low temperature and low pressure b) High temperature and High pressure
 c) High temperature and low pressure d) Low temperature and High pressure

14) Among the following which is the path function ?

- a) G b) U c) H d) q

15) Match the following

- | | |
|-------------------------|----------------------|
| 1) Iodoform | i) Fire extinguisher |
| 2) Carbon tetrachloride | ii) Insecticide |
| 3) CFC | iii) Antiseptic |
| 4) DDT | iv) Refrigerants |

a) (1)-(iii), (2)-(i), (3)-(iv), (4)-(ii)

b) (1)-(ii), (2)-(iv), (3)-(i), (4)-(iii)

b) (1)-(iii), (2)-(ii), (3)-(iv), (4)-(i)

d) (1)-(i), (2)-(ii), (3)-(iii), (4)-(iv)

PART-II Answer any six questions. Question No. 24 is compulsory. 6x2=12

16) Define basicity. Find the basicity of ortho-phosphoric acid.

17) Write the exchange reactions of Deuterium.

18) State Zeroth Law of Thermodynamics.

19) Explain homogeneous and heterogeneous equilibria.

20) Write the shape and molecular geometry for BF_3 .

21) Which element exhibits maximum catenation and why?

22) Write the no bond resonance structure shown by propene.

23) Give the structure and uses of DDT.

24) In degenerate orbitals, why do the completely filled and half-filled configurations are More stable than the partially filled configuration?

PART-III Answer any six questions. Question No. 33 is compulsory. 6x3=18

25) State Heisenberg's Uncertainty Principle.

26) Derive ionic radius using Pauling's method.

27) How do you convert para hydrogen into ortho hydrogen?

28) Distinguish between extensive and intensive property.

29) Calculate the mole fraction of methanol and water when 0.5 mole of methanol is mixed with 1.5 moles of water.

30) What is hybridisation? Mention the type of hybridization found in CH_4 .

31) Explain the different types of polymerisation in ethyne.

32) What is greenhouse effect? Name the gases that cause greenhouse effect.

33) Explain geometrical isomerism in 2-butene.

Part IV Answer the following 5x5=25

34) (a) Calculate the empirical and molecular formula of a compound containing 76.6% carbon, 6.38% of hydrogen and rest oxygen. Its vapour density is 47. Or

(b)(i) Calculate the total number of angular nodes and radial nodes present in 3d and 4f orbitals.

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(ii) Explain why the electron affinity of Be and N is almost zero.

35) (a) (i) write the laboratory method of preparation of hydrogen.

(ii) Name the different methods of liquefaction of gases. or

(b) (i) How is bleaching powder prepared?

(ii) Write the uses of Magnesium.

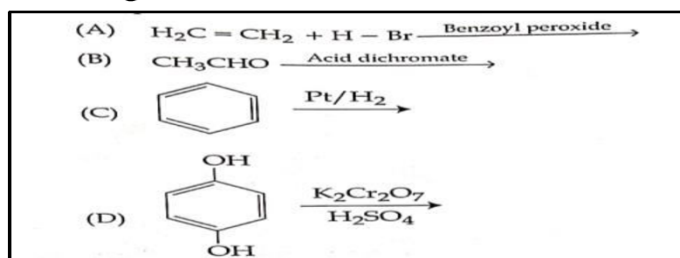
(iii) Write the mathematical formula for compressibility factor Z.

36) (a) (i) Derive the relation between enthalpy H and internal energy U for an ideal gas.

(ii) Define reaction quotient.

(b) (i) 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 6008J m/mole.

(ii) Write any four postulates of molecular orbital theory.



Or

37) (a) (i) what is Vant's Hoff factor 'i'.

(ii) complete:

Or

(b) Explain the purification of solid organic compound by crystallization method.

38) (a) (i) Write Birch reduction.

(ii) Write any three strategies to control environmental pollution. Or

(b) Explain the mechanism involved in the elimination reaction of tertiary butyl chloride with alcoholic KOH.

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