VCD/ 28/11/22 FYBSC SEM I CHEMISTRY P I

TIME: 2 HRS 30 MIN MARKS :75

1. **All** questions are **compulsory.**
2. **All questions** carry **equal** marks.
3. Draw **neat, labelled diagrams** wherever necessary.

Q1 A. Select the correct option. (Any 9) (Marks : 9)

1.State functions are _____.
a) path independent b) inexact differential c) path dependent d) extensive property

2.Which of the following is extensive property _____.
a) mass b)density c)concerntration d) pressure

3. 4.0dm^3 of 4M HNO_3 contains _____ moles of HNO_3.
a) 4 b) 1 c) 16 d) 2

4.Number of moles corresponding to 90g of water is _____.
a) 3 b) 2 c) 5 d) 6

5. 3s orbital has _____radial nodes.
a) three b) two c) one d) four

6. In ground state of atom ,the electron occupies the ____energy orbital.
a) highest b) lowest c) middle d) zero

7. The verticals column in periodic table are called _____.
a) periods b) groups c) sub groups d) main groups

8. The horizontal rows of long periodic table are called_____.
a) groups b) periods c) main groups d) sub groups

9. Buta-2-en has _____ isomer.
a) 2 b) 1 c) 3 d) 4

10. Sigma bond is _____ than pi bond .
a) weak b) strong c) moderate d) valuable

11.Propane has _____ carbon atom.
a) 4 b) 3 c) 5 d) 2

12.Bond angle in Methane molecule is _____.
a)107^0 b) 104^0 c) 109^028 d) 105^0

13.The shape of p orbital is _____shape.
a) square b) dumb bell c) double dumb bell d) elliptical

B. State whether true or false . (Marks : 3)

1.The equivalent weight of oxidizing agent does not depends on the other reactant present in the reaction.

2.There are thirty two elements in fifth period.

3.Pi bond is weaker than sigma bond.

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C. Match the following columns (Marks:3)

Column A	Column B
1 . Mass	1. 8 elements
2. Second period	2. Ethene
3. $CH_2=CH_2$	3. Extensive property

Q 2.Attempt any four of the following questions (Any 4) (Marks: 20)

1. State and derived mathematical expression for First law of thermodynamics.
2. Define the following terms a) open system b) Isothermal process c) Isochoric process d) Surrounding e) Isolated system
3. State limitations of First law of thermodynamics.
4. Determine the molarity of the following which contain a) 4.9g of H_2SO_4 in 5L solution b) 16.0g of CH_3OH in 200 cm^3 of solution.
5. Calculate the weight of the following substances that will be required to prepare 250 ml of 0.1 N solution a) HCl b) H_2SO_4
6. Explain the concept of heat and work in thermodynamics along with its sign conventions.

Q 3.Attempt any four of the following questions (Any 4) (Marks :20)

1. Explain Rutherford's model of an atom based on alpha particles scattering experiment.
2. Discuss the basis of Bohr's atomic model and limitations of Bohr's atomic model.
3. Explain atomic spectrum of hydrogen atom.
4. What is meant by Effective nuclear charge? Calculate the effective nuclear charge felt by 4s electron of Potassium.
5. State modern periodic law. What are the types of elements in the long form of periodic table?
6. What is meant by electron gain enthalpy? State the factors influencing electron gain enthalpy value.

Q 4.Attempt any four of the following questions (Any 4) (Marks : 20)

1. Write the structural formula for each of the following compounds.
a) Cis-2-butene b) 1,3-Dimethyl cyclohexane c) 3-Ethylcyclopentanol d) Cyclopentane e)Sodium Ethanoate.
2. Explain the sp^3 hybridisation of Carbon. Explain formation of Methane molecule.
3. What is resonance? What are the requirement for a molecule to exhibit resonance.
4. Distinguish between sigma bond and pi bond .
5. Explain the following. a) Alcohols are almost neutral compound.
b) Monochloroacetic acid is stronger than acetic acid.
6. Explain sp hybridisation of Carbon .

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