

Roll No.

Z-9-A

[Total No. of Printed Pages : 8]

Total No. of Questions : 4]

11th ARF(SZ)JKUT2024-25

209-A

CHEMISTRY

[Maximum Marks : 70]

Time : 3 Hours]

General Instructions :-

- (i) There are total four Sections in the question paper. All questions are compulsory.
- (ii) Section-A contains ten Objective Type Questions/Multiple Choice Questions of 1 mark each. (1×10=10)
- (iii) Section-B contains nine Very Short Answer Type Questions of 2 marks each to be answered in 20 to 30 words. (2×9=18)
- (iv) Section-C contains nine Short Answer Type Questions of 3 marks each to be answered in 100 to 150 words. (3×9=27)
- (v) Section-D contains three Long Answer Type Questions of 5 marks each to be answered in 150 to 200 words. (5×3=15)
- (vi) Use log tables, if necessary. Use of scientific calculators is not allowed.

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209-A

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Turn Over

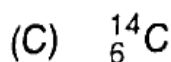
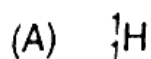
Section-A

(Objective Type Questions/Multiple Choice Questions)

1 each

1. Select the correct one :

(i) Which of the following is the standard for atomic mass ?



(ii) Which of the following contains maximum number of atoms ?

(A) 6.023×10^{21} molecules of CO_2 (B) 22.4 L of CO_2 at STP ✓(C) 0.44 g of CO_2

(D) None of these

(iii) The discovery of nucleus was done by :

(A) J. J. Thomson

(B) Chadwick

(C) Rutherford

(D) Moseley

(iv) The most electronegative element in the periodic table is :

(A) Nitrogen

(B) Oxygen

(C) Chlorine ✓

(D) Fluorine

(v) Hydrogen molecule is :

- (A) Polar
- (B) Ionic
- (C) Covalent
- (D) Non-Polar ✓

(vi) Carbon in ethylene involves the hybridisation :

- (A) sp^3
- (B) sp^2
- (C) sp ✓
- (D) None of these

(vii) Internal energy does not include :

- (A) Nuclear energy
- (B) Vibrational energy
- (C) Rotational energy
- (D) Energy of gravitational pull ✓

(viii) An oxidation process involves :

- (A) Increase in oxidation number
- (B) Decrease in oxidation number
- (C) Addition of electrons
- (D) Removal of electronegative element

(ix) Which of the following is an electrophile ?

- (A) AlCl_4^- (B) BCl_3
 (C) NH_3 (D) CH_3OH

(x) Which of the following represents the general formula of alkenes ?

- (A) C_nH_{2n} (B) $\text{C}_n\text{H}_{2n-2}$
 (C) $\text{C}_n\text{H}_{2n+2}$ (D) $\text{C}_n\text{H}_{2n+1}$

Section-B

2 each

(Very Short Answer Type Questions)

2. Answer the following questions :

- (i) What are the main postulates of Dalton's Atomic theory ?
- (ii) Define ionisation enthalpy. What are its units ?
- (iii) Explain, why H_2S is a gas while H_2O is liquid, even though both S and O are elements of the same group.
- (iv) What do you understand by open and isolated systems ? Give examples.
- (v) What are buffer solutions ? How can you say that buffers are used as an important part of many industrial processes ?

- ✓(vi) State Le Chatelier's principle. Give one example of its application in chemical industries.
- (vii) What are carbocations ? How are they classified ? Give their order of stability.
- (viii) What is Wurtz Reaction ? How can it be used to prepare butane ?
- (ix) Discuss briefly the structure of a triple bond.

Section-C

(Short Answer Type Questions)

3 each

3. Answer the following questions :

- (i) N and O combine with H to form NH_3 and H_2O and they combine with each other to form NO_2 . Which law is illustrated ? Explain briefly.
- ✓(ii) What are Quantum Numbers ? Explain the significance of any two of the Quantum numbers.
- ✓(iii) State Modern periodic law. What are the main features of the long form of the periodic table ?

- (iv) What is hybridisation ? Explain sp^2 hybridisation with an example.
- (v) State first law of thermodynamics and give a mathematical expression for it. Mention two examples to support the law.
- (vi) Explain term enthalpy. How does it differ from internal energy ?
- (vii) What are strong and weak electrolytes ? Derive an expression for the calculation of the degree of ionisation of a weak electrolyte.
- (viii) H_2S acts only as reductant where as SO_2 acts as both oxidant and reductant. Why ? <https://www.jkboseonline.com>
- (ix) Discuss various types of organic reactions (any three) with examples.

Section-D

(Long Answer Type Questions)

5 each

4. Answer the following questions :

- (i) State and explain Heisenberg's uncertainty principle.

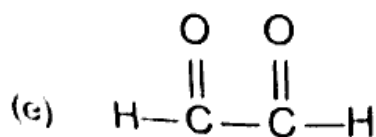
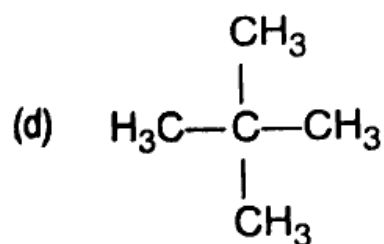
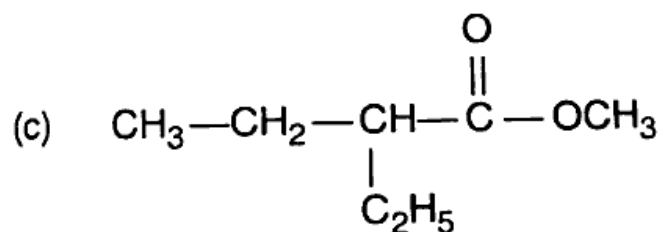
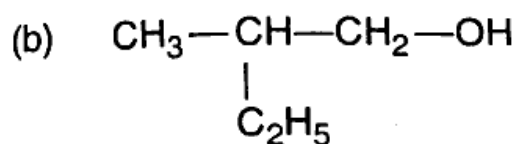
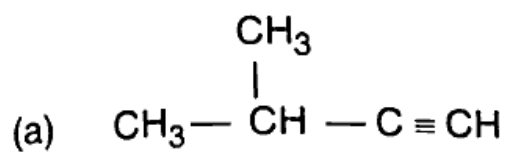
Or

Define an atomic orbital. Discuss the shapes of s , p and d orbitals.

- (ii) Explain inductive effect and electromeric effect.

Or

Write IUPAC names of the following compounds :



- (iii) What is Ozonolysis ? How it can be used to determine the position of double bond in an unknown alkene ?

Or

Write short notes on the following :

- (a) Markovnikoff's rule
- (b) Friedel-Crafts acylation
- (c) Benzene resonance