

SEMESTER EXAMINATION-2021
CLASS – B.Sc. I SEMESTER
SUBJECT - CHEMISTRY
PAPER CODE: BCH-C101
(Atomic Structure, Bonding, General Organic Chemistry & Aliphatic Hydrocarbons)

Time: 3 hour

Max. Marks: 70

Min. Pass: 40%

Note: Question Paper is divided into two sections: **A and B**. Attempt both the sections as per given instructions.

SECTION-A (SHORT ANSWER TYPE QUESTIONS)

Instructions: Answer any five questions in about 150 words each. Each question carries six marks. (5 X 6 = 30 Marks)

Question-1: Give the mechanism for addition of HBr to propene in presence of a peroxide.

Question-2: How many orientations are possible for d-orbitals? Name these orbitals.

Question-3: Write Schrodinger wave equation for hydrogen atom. Also cite various parameters used in the equation.

Question-4: Write a short note on Markovnikov rule.

Question-5: Define the terms: Aromatic, Non- aromatic and Anti-aromatic compounds and classify the following into these: (i) Napthalene (ii) Cyclopropenyl ion

Question-6: What is Born- Haber cycle? Discuss its usefulness by explaining the stability of solids.

Question-7: Write notes on : (a) Optical isomerism (b) Geometrical isomerism

Question-8: What are the factors responsible for the stability of half- filled and completely filled orbitals?

Question-9: What are conformational isomers? Discuss the conformational isomers of n-butane.

Question-10: What are +I effect and -I effect? Illustrate with two examples in each case.

SECTION-B (LONG ANSWER TYPE QUESTIONS)

Instructions: Answer any FOUR questions in detail. Each question carries 10 marks. (4 X 10 = 40 Marks)

Question-1: (a) Discuss the Aufbau principle. What are its limitations?
(b) What is exchange energy and how does it influence electronic configuration?

Question-2: Discuss the shape of the following: (i) $2p_x$ (ii) $3s$ (iii) $3d_{xy}$ (iv) $3p$

Question-3: How is Molecular Orbital Theory different from Valence Bond Theory? Explain the diamagnetic nature of N_2 molecule on the basis of Molecular Orbital Theory.

Question-4: (a) Give the oxidation reactions of Alkenes.
(b) How will you prepare alkenes from alkynes?

Question-5: (a) What do you understand by terms: (i) Resonance (b) Resonance energy.
(b) Give the essential conditions for writing resonating structures.

Question-6: (a) What happens when acetylene is passed through a red hot iron tube?
(b) Out of ethylamine and acetamide, which is more basic and why?

Question-7: What do you understand by radial and angular wave functions? How will you represent the complete wave function in terms of radial and angular wave functions?

Question-8: On the basis of hybridization, discuss the geometry of the following molecules: (i) IF_5 (ii) XeF_4 (iii) PCl_5 (iv) NH_3

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