BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO2022)

CLASS: IMSC **SEMESTER: I**
BRANCH: MATHEMATICS & COMPUTING / PHYSICS **SESSION: MO22**

SUBJECT: CH111 GENERAL CHEMISTRY-I

TIME: 02 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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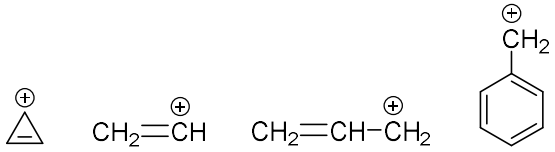
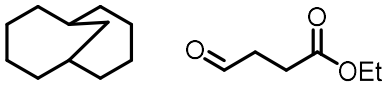
			CO	BL
Q.1(a)	Discuss the significance of Heisenberg's uncertainty principle	[2]	1	1
Q.1(b)	The wavelength of first spectral line in the Balmer series is 6561 A°. Calculate the wavelength of the second spectral line in Balmer series.	[3]	3	4
Q.2(a)	Radius of the fourth orbit in hydrogen atom is 0.85 nm. Calculate the velocity of the electron in this orbit (mass of electron = 9.1×10^{-31} kg).	[2]	1	4
Q.2(b)	Draw the shapes of d- orbitals properly.	[3]	1	1
Q.3(a)	Explain the Bohr Bury's rule.	[2]	1	1
Q.3(b)	What is radial probability distribution functions? Draw radial probability distribution function for 2s orbital.	[3]	3	3
Q.4(a)	Arrange the following carbocations in the increasing order of stability. 	[2]	4	4
Q.4(b)	Discuss the structure and geometry of a carbocation.	[3]	4	1
Q.5(a)	Write down the IUPAC name for the following compounds: 	[2]	2	2
Q.5(b)	Discuss "hyperconjugation" and its role in stability of free radical with examples.	[3]	3	4

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