647510 BSCchMJ304x-6C Seat No :_____

B.Sc. Semester - 6 (NEP-2020) Examination

March/April-2026

CHE: Higher Chemistry-304 (Major-14)

Time: 2:00 Hours **Marks: 50**

Instructions:

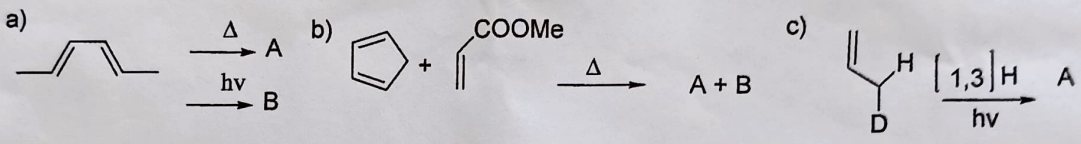
1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1 Answer any two out of three questions given. (10)

1) Discuss splitting of d-orbital in octahedral field with CFSE.
2) Discuss factors affecting splitting energy of the d-orbitals.
3) Explain why $[Ni(CN)_4]^{2-}$ is square planar but $[Ni(Cl)_4]^{2-}$ is tetrahedral.

Que.2 Answer any two out of three questions given (10)

1) Name only main types of pericyclic reactions. Draw π-molecular orbitals of 1,3,5-hexatriene system, fill up the electrons and identify symmetry of HOMO and LUMO in G.S and write the number of nodes in each.
2) Write products only for the following three pericyclic reactions.



3) Explain Fluorescence and Chemiluminescence.

Que.3 Answer any two out of three questions given. (10)

1) Explain the effects of temperature on magnetic susceptibility of magnetic substances.
2) Discuss Guoy's method to determine magnetic susceptibility of transition metal complexes.
3) Define: Molecular ion peak, base peak and Explain Nitrogen rule.

Que.4 Answer any two out of three questions given. (10)

1) Discuss electrolyte concentration cell without Transference.
2) Explain determination of ionic product of water (kw)using electrochemistry.
3) Discuss components of colorimeter.

Que.5 Answer any two out of four questions given. (10)

1) Discuss high spin and low spin complexes.
2) Discuss difference between Thermal and Photochemical reactions.
3) Write a note on mass spectra of alkanes.
4) Define: Absorbance and Explain Lambert-Beer law for colourimetry.

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