Name of the Examination **FIVE YEAR INTEGRATED M. Sc.** Part/Semester **VII** 20**21**

Subject **CHEMISTRY THEORY** Paper/Course **CH-4-7-5** Half

Time **Three (03)** Hours Full Marks 4**0**

Questions are of value as indicated in the margin

Group-A

(Answer ***any five*** questions) Marks

1. (a) What are natural polymers? Give two examples. 5x2=10
   (b) What are the photochemical initiation and the thermal initiation?
   (c) What are the good solvents and the poor solvents?
   (d) What is the ultimate strength or tensile strength of a polymer?
   (e) What is theta temperature?
   (f) What are the thermoplastics and thermosetting plastics?

Group-B

(Answer ***any three*** questions)

2. (a) "Polymeric materials are characterized by two major type of transition temperature" What are those? Do all polymers show both the thermal transitions? Discuss in the light of their crystallinity. 2+3
   (b) Derive the working formula for measuring the molecular weight of a polymeric particle much smaller than the wavelength of the incident radiation. What type of molecular weight you may expect from this experiment? 4+1
3. (a) What are the essential structural requirements for a conducting polymer to ensure viable polymeric conduction? Discuss with suitable example. 4
   (b) What is tacticity? Classify the sequences depending on the tacticity on the asymmetric carbon atom present in the polymer chain. 6
4. (a) Write down the expression of the Mark-Houwink-Sakurada (MHS) equation of intrinsic viscosity of a polymer solution. Explain the classical method of determination of the MHS constant and the exponent. 1+4
   (b) What are the fillers and plasticizers? Why do they add in the synthesis of commercial polymers? 2+3
5. (a) Write the differences between addition polymerization and condensation polymerization with suitable examples. 2+2
   (b) Describe the kinetics of chain polymerization by free radicals. Obtain expression for rate of polymerization and degree of polymerization. 2+4
6. Write notes on (any two) 5+5
   (a) Biodegradable polymers
   (b) Elastomers, Fibers and Plastics
   (c) Living polymers