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BCG-003-1015022 Seat No. _____

B. Sc. (Sem. V) (CBCS) Examination

August – 2021

**BS - IC - 502 : Polymer Chemistry & Analytical
Techniques**

Faculty Code : 003

Subject Code : 1015022

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

INSTRUCTIONS:

- 1) Question paper carries total 5 questions
- 2) All the questions are compulsory
- 3) All questions carry 14 marks each.
- 4) Figures to the right indicate maximum marks.
- 5) Draw labeled diagram wherever necessary.
- 6) Assume suitable data.

1A: Answer the following questions. 04

1. Define: Monomer.
2. Give equation of polydispersity index.
3. Define synthetic polymer with examples.
4. Write equation for measurement of weight average molecular weight.

B: Answer in brief. 02

1. Explain elasticity of polymer. Give examples of elastic polymer.

C: Answer in detail. 03

1. Explain glass transition temperature in brief.

D: Write a note on. 05

1. Draw diagrams of IR, NMR & Mass spectroscopy for analysis of polymer.

2A: Answer the following questions. 04

1. Addition polymerization can only take place when monomer is _____. (Saturated, Unsaturated)
2. Write a name of Natural Polymer.
3. Define natural polymer with examples.
4. Define: monomer

B: Answer in brief.	02
1. Explain transfer molding in detail.	
C: Answer in detail.	03
1. Enlist different methods for measurement of molecular weight of polymer, explain any one in detail.	
D: Write a note on.	05
1. Explain classification of polymer with structures and properties in detail	
3A: Answer the following questions.	04
1. Benzoyl peroxide is added as _____ in free radical polymerization process.	
2. _____ is byproduct after condensation process for manufacturing of Nylon-6,6.	
3. Enlist steps of addition polymerization mechanism	
4. _____ is used as catalyst for manufacturing of polymer	
B: Answer in brief.	02
1. Write a short note on compounding of polymer.	
C: Answer in detail.	03
1. Write mechanism for condensation polymerization process.	
D: Write a note on.	05
1. Write detailed mechanism of free radical addition polymerization.	
4A: Answer the following questions.	04
1. _____ molding is used for manufacturing uniform cross sectional pipes from polymer.	
2. Polymer bottles can be manufactured by _____ molding process.	
3. _____ is used to make coloured polymer.	
4. _____ is used as initiator in cationic addition polymerization mechanism.	
B: Answer in brief.	02
1. Explain injection molding in detail with diagram.	
C: Answer in detail.	03
1. Explain in brief: Extrusion molding in detail	
D: Write a note on.	05
1. Explain anionic mechanism for addition polymerization.	
5A: Answer the following questions.	04
1. Write full form of HDPE.	
2. Write structure of polycarbonate polymer.	
3. Give full form of LDPE.	
4. Write structure of melamine monomer.	

B: Answer in brief.	02
1. Write a brief note on PVC.	
C: Answer in detail.	03
1. Write a note on polystyrene in detail.	
D: Write a note on.	05
1. Explain phenol formaldehyde polymer with mechanism, application and properties.	
6A: Answer the following questions.	04
1. AlCl_3 & TiCl_4 is _____ catalyst used in polymer.	
2. Give structure of urea formaldehyde polymer.	
3. Write only structure of neoprene polymer.	
4. Give full form of ABS polymer.	
B: Answer in brief.	02
1. Give structures of poly isoprene, cis, trans, 1,2 & 3,4 isomers.	
C: Answer in detail.	03
1. Write a note on epoxy resin.	
D: Write a note on.	05
1. Explain in detail: Melamine Formaldehyde polymer, its mechanism, properties & applications.	
7A: Answer the following questions.	04
1. Write any three instruments of physico-chemical analysis.	
2. Enlist parts of pH meter.	
3. _____ are two methods of gas sampling.	
4. "Prism is utilized in conductometer" is this statement true or false?	
B: Answer in brief.	02
1. Draw only diagram of polarimeter.	
C: Answer in detail.	03
1. Explain colorimetric titration.	
D: Write a note on.	05
1. Explain potentiometric & pH metric titration in detail.	
8A: Answer the following questions.	04
1. Define: Polarimeter	
2. " CH_3COOH is weak base" true or false?	
3. List two methods of gas sampling.	
4. _____ has first developed refractometer.	
B: Answer in brief.	02
1. Write brief note on gas sampling method used in analytical techniques.	
C: Answer in detail.	03
1. Explain sampling of solid sample in detail.	

D: Write a note on.	05
1. Explain principal, procedure and application of refractometer in detail.	
9A: Answer the following questions.	04
1. _____ is range of UV radiation.	
2. _____ Salt is used to prepare sample palatte in IR spectroscopy.	
3. Give full form of HPLC.	
4. Give equation of retardation factor.	
B: Answer in brief.	02
1. Explain classification of chromatographic techniques.	
C: Answer in detail.	03
1. Explain in brief: Mass spectrometry.	
D: Write a note on.	05
1. Explain in detail: gas liquid chromatography.	
10A: Answer the following questions.	04
1. Write an equation of partition coefficient for chromatography.	
2. What is full form of TCD?	
3. Write an equation of partition coefficient.	
4. Give full form of LLC	
B: Answer in brief.	02
1. Give applications of Gas chromatography.	
C: Answer in detail.	03
1. Write a note on UV-Visible spectrometry.	
D: Write a note on.	05
1. Give a detailed note on instrumentation of NMR spectrometry.	
