



**JW-003-1015022**

Seat No. \_\_\_\_\_

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

**October - 2019**

**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 and carry 14 marks each.
  - (3) Draw labeled diagram wherever necessary.
  - (4) Assume suitable data.

- 1 (a) Answer the following questions : 4
- (1) \_\_\_\_\_ is example of homo-polymer.
  - (2) \_\_\_\_\_ is example of co-polymer.
  - (3) Jute is \_\_\_\_\_ type of polymer.
  - (4) "Melamine is thermosetting polymer". Is this statement true or false ?
- (b) Answer in brief : (any **one** out of two) 2
- (1) Define: polymer.
  - (2) What is homo-polymer and co-polymer.
- (c) Answer in detail : (any **one** out of two) 3
- (1) Explain tensile strength and compressive strength of polymer.
  - (2) Describe crystallinity in polymer with processes.
- (d) Write note on : (any **one** out of two) 5
- (1) Explain classification of polymer in detail.
  - (2) Explain weight average and number average molecular weight in detail.

- 2 (a) Answer the following questions : 4
- (1) "Initiation is second stage of addition polymerization". (True or False)
  - (2) Benzoyl peroxide is used in addition polymerization as \_\_\_\_\_.
  - (3) Give full form of SBR polymer.
  - (4) Pipes with uniform cross sectional area can be manufactured by \_\_\_\_\_ molding.
- (b) Answer in brief : (any **one** out of two) 2
- (1) Define: Addition polymerization.
  - (2) Explain polymer compounding in detail.
- (c) Answer in detail : (any **one** out of two) 3
- (1) Explain condensation mechanism for polymerization.
  - (2) Explain termination step of addition polymerization.
- (d) Write note on : (any **one** out of two) 5
- (1) Explain injection molding process with diagram.
  - (2) Write a note on compression molding process of polymer.
- 3 (a) Answer the following questions : 4
- (1) Give structure of butadiene monomer.
  - (2) Give structure of polyvinyl acetate.
  - (3) Write uses of natural rubber.
  - (4) Sulfur is used in vulcanization process for \_\_\_\_\_ manufacturing.
- (b) Answer in brief : (any **one** out of two) 2
- (1) Explain polyurethane in detail.
  - (2) Write types of chloroprene polymer.

- (c) Answer in detail : (any **one** out of two) **3**
- (1) Explain manufacturing of melamine polymer in detail.
  - (2) Explain manufacturing of phenol formaldehyde polymer in detail.
- (d) Write a note on : (any **one** out of two) **5**
- (1) Explain addition polymerization mechanism, use and properties of Polystyrene.
  - (2) Explain addition polymerization mechanism, use and properties of Polypropylene.
- 4 (a) Answer the following questions : **4**
- (1) Enlist various light sources used in colorimetric analysis.
  - (2) Potentiometric titration method can't be used for dilution solution. True/False?
  - (3) Enlist types of conductance.
  - (4) Angle of rotation can be determined by using \_\_\_\_\_ instrument.
- (b) Answer in brief : (any **one** out of two) **2**
- (1) Write principle of potentiometric titration.
  - (2) Give importance of analytical instruments in chemical industries in brief.
- (c) Answer in detail : (any **one** out of two) **3**
- (1) Draw only diagram of Polarimeter.
  - (2) Write advantages of conductometric titration.
- (d) Write a note on : (any **one** out of two) **5**
- (1) Write a detailed note on colorimetric method.
  - (2) Explain refractometry method with diagram.

- 5 (a) Answer the following questions : 4
- (1) Give full form of ASTM.
  - (2) The range of light source for UV spectroscopy is \_\_\_\_\_ nm to \_\_\_\_\_ nm.
  - (3) While splitting the sample, \_\_\_\_\_ of the sample must not be changed.
  - (4) Mass spectrometry is used to detect functional group present in hydrocarbon. True/False ?
- (b) Answer in brief : (any **one** out of two) 2
- (1) Write a note on partition ratio.
  - (2) Write a brief note on carrier gas selection.
- (c) Answer in detail : (any **one** out of two) 3
- (1) Discuss basic sampling rules for sampling technique.
  - (2) Explain thermionic emission detector in detail.
- (d) Write note on : (any **one** out of two) 5
- (1) Explain gas-liquid chromatography technique with diagram.
  - (2) Discuss NMR spectroscopy with neat diagram.
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