

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: BTECH  
BRANCH: CHEMICAL**

**SEMESTER : VI  
SESSION : SP/2025**

**SUBJECT: CL349 POLYMER PROCESSING**

**TIME: 3 Hours**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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|---|-----|-----------|-----------|
| Q.1(a) Discuss the various mathematical models that best represent the behaviour of viscoelastic polymers.  | [5] | CO<br>CO2 | BL<br>BL3 |
| Q.1(b) Discuss the effect of molecular weight and molecular weight distribution on viscosity.   | [5] | CO1       | BL3       |
| Q.2(a) Discuss the function of haul-off unit in pipe extrusion line?  | [3] | CO3       | BL2       |
| Q.2(b) Explain the main line elements of a blown film plant with a neat sketch to manufacture blown films?  | [7] | CO1       | BL2       |
| Q.3(a) Explain the following specialized injection moldings process with a neat sketch?<br>(i) Push-pull injection molding<br>(ii) Structural Foam injection molding  | [5] | CO3       | BL2       |
| Q.3(b) Discuss any five possible defects and their causes and remedies in the injection moulding process.   | [5] | CO4       | BL3       |
| Q.4(a) Discuss the following thermoforming process with a neat sketch.<br>(i) Vacuum Forming<br>(ii) Pressure Forming<br>(iii) Matched Die Forming<br>(iv) Dual Sheet Forming   | [8] | CO2       | BL3       |
| Q.4(b) A rectangular box 150 mm long, 100 mm wide and 60 mm deep is to be thermoformed from a flat sheet 150 mm x 100 mm x 2 mm. Estimate the average thickness of the walls of the final product If conventional vacuum forming is used. | [2] | CO5       | BL4       |
| Q.5(a) Derive the equation to determine the minimum platen force "F" required for a successful compression moulding process with a suitable figure.   | [7] | CO5       | BL5       |
| Q.5(b) Write down the advantages and limitations of the Rotational Molding Process and mention its various applications.  | [3] | CO4       | BL2       |

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