

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

CLASS: BE
BRANCH: CHEMICAL ENGG.- PLASTICS & POLYMER

SEMESTER: VI/ADD
SESSION : SP/2019

SUBJECT: PC6005-POLYMER PROCESSING

TIME: 1.5 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 30.
 2. Candidates may attempt for all 30 marks.
 3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. The missing data, if any, may be assumed suitably.
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- Q1 (a) Define elongational viscosity with example. [2]
(b) How is viscosity dependent of temperature? [3]
- Q2 (a) Derive equation for Maxwell element of viscoelastic model. [2]
(b) Describe about the different types rotational rheometers based on design criteria. [3]
- Q3 (a) A cone & plate rheometer with a 50mm diameter cone having 4 degree angle is used to measure viscosity of a polymer when operating at 1rpm a torque of 0.5 N m is measured. [2]
(b) Write Notes on: Bingham plastics material. [3]
- Q4 (a) Discuss the problems associated with extrusion-based blow moulding. [2]
(b) Derive the expression of thickness of blow moulded article. [3]
- Q5 (a) What are the advantages of calendering? [2]
(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 (a) conventional vacuum forming is used and (b) plug assisted moulding is used (the plug being 140 mm x 90 mm). [3]
- Q6 (a) Draw and discuss the positive thermoforming process. [2]
(b) Draw and discuss the temperature profile diagram for rotational moulding process. [3]

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