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

CLASS: B.TECH. **SEMESTER : VI**
BRANCH: CHEMICAL ENGINEERING-PLASTICS & POLYMER **SESSION : SP/2023**

SUBJECT: CL312R1 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)	Describe the effect of molecular weight and molecular weight distribution on viscosity.	[2]	1	2
Q.1(b)	Derive the expression of measuring elongational viscosity under constant strain rate.	[3]	3	4
Q.1(c)	Compare between Maxwell model and Kelvin Voigt Model for predicting viscoelastic properties of polymer.	[5]	2	1
Q.2(a)	Draw a neat diagram of an extruder screw and mark all the different parts of the screw.	[2]	1	2
Q.2(b)	Describe the different zones of an extruder screw and elaborate their function.	[3]	1	2
Q.2(c)	Elaborate the process of Blown Film extrusion. Derive the expression of ratio of machine to transverse direction orientation in Blown Film process.	[2+3]	2	3
Q.3(a)	How do you distinguish injection screw from extrusion screw?	[2]	2	2
Q.3(b)	List 3 Injection Molding defects and write down their probable causes.	[3]	4	2
Q.3(c)	Summarize about Structural Foam Moulding	[5]	2	3
Q.4(a)	Classify different types of calendar rolls arrangement with suitable drawing.	[2]	1	2
Q.4(b)	Demonstrate the bottle necks of extrusion blow moulding process. How the problems can be resolved?	[1+2]	3	3
Q.4(c)	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 3 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 145 mm x 95 mm).	[5]	5	5
Q.5(a)	Write the advantages of transfer moulding over compression moulding.	[2]	1	1
Q.5(b)	Draw and discuss the temperature profile diagram for rotational moulding process.	[3]	2	3
Q.5(c)	Derive the minimum platen force required for successful compression moulding process with suitable drawing.	[5]	3	4

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