

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

**CLASS: BTECH
BRANCH: CHEMICAL**

**SEMESTER : VII
SESSION : MO/2025**

SUBJECT: CL433 POLYMER COMPOSITE

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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		CO	BL
Q.1(a)	Explain the need for polymer composite (PMC) in modern engineering applications and how they differ from traditional materials (e.g., steel, aluminum).	[5] I	II
Q.1(b)	Discuss the different ways in which composites can be classified (for example, based on their matrix, reinforcement, or structure).	[5] I	IV
Q.2(a)	Discuss the influence of fiber length, orientation, and volume fraction on the mechanical properties of a PMC.	[5] II	II
Q.2(b)	Describe the properties and advantages of carbon fiber composites over glass fiber composites	[5] II	II
Q.3(a)	Discuss the key differences in properties between thermoset and thermoplastic polymers used in composites?	[5] III	IV
Q.3(b)	Describe difference in mechanical properties as a function of temperature for thermoplastics.	[5] III	IV
Q.4(a)	Explain the hand layup and spray-up molding processes with diagrams.	[5] IV	II
Q.4(b)	Describe the pultrusion process and its advantages.	[5] IV	II
Q.5(a)	Describe the pultrusion process and explain why it is a suitable method for producing continuous fiber-reinforced profiles.	[5] V	V
Q.5(b)	Explain how the continuous nature of the fibers in a composite influences its overall strength and stiffness compared to a short-fiber composite.	[5] V	V

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