

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

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Fifth Semester B.E. Degree Examinations, September/October 2024

COMPOSITE MATERIALS

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions choosing ONE full Question from each Module.
2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PI)</u>
<u>Module-1</u>			
1.	a. Classify the composite materials in detail and justify why the composites are better than the conventional materials.	10	(1 :1 : 1.3.1)
	b. Explain briefly the composites based on reinforcements and the type of matrix	10	(1 :1 : 1.4.1)
(OR)			
2.	a. Distinguish between thermosetting and thermoplastic polymers with appropriate examples.	10	(1 :1 : 1.3.1)
	b. With a neat figure, explain briefly about Interface and Interphase and also differentiate between them.	10	(1 :1 : 1.4.1)
<u>Module-2</u>			
3.	a. With a neat line diagram, illustrate the Vacuum bag moulding process.	10	(2 :2 : 1.4.1)
	b. Describe briefly, the filament winding process with a neat sketch. Also highlight the advantages of filament winding process with other processes.	10	(2 :2 : 1.4.1)
(OR)			
4.	a. With a neat line diagram, differentiate between open and closed mould process.	10	(3 :2 : 1.7.1)
	b. List the various methods available for manufacturing of composite materials. Also discuss the application of composite materials for engineering aspect.	10	(2 :2 : 1.4.1)
<u>Module-3</u>			
5.	a. With a neat sketch, explain Compo/Rheo casting process.	10	(2 :3 : 1.4.1)
	b. With a neat sketch, explain squeeze casting process.	10	(2 :3 : 1.4.1)
(OR)			
6.	a. Explain briefly spray deposition process with neat line diagram.	10	(2 :3 : 1.4.1)
	b. List and explain the different stages involved in powder metallurgy process for metal matrix composites.	10	
<u>Module-4</u>			
7.	a. List and explain the properties of continuous fiber composites and also highlight the difference in them compared to other materials.	10	(1 :4 : 1.3.1)
	b. Distinguish between Iso-stress and Iso-strain condition with neat sketches.	10	(1 :4 : 1.4.1)

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)

(OR)

8. a. Show the stress Vs strain curves for PMC, MMC, CMC and also list the advantages, limitations and applications of PMC, MMC and CMC. **10** (1 :4 : 1.3.1)
- b. Evaluate the longitudinal modulus, tensile strength and fraction of load taken by fibers of a unidirectional composite containing 55 % by volume of Sisal fibres in epoxy matrix. The modulus and strength of fibers is 30 GPa and 600 MPa respectively and the same for matrix is 3.5 GPa and 100 MPa respectively. **10** (1 :4 : 1.4.1)

Module-5

9. a. Show the classifications of Bio-composites. Explain Bio-composites by highlighting the applications of Bio-composites. **10** (1 :5 : 1.4.1)
- b. Explain the procedure adopted in Izod test with a neat sketch. **10** (2 :5 : 1.4.1)

(OR)

- 10 a. List the desirable properties of composite materials and explain any three in detail. **10** (1 :5 : 1.4.1)
- b. Discuss about laminates. Also list the advantages of laminates over composites created using hand layup process. **10** (1 :5 : 1.3.1)

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