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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

First Semester, M. Tech – Mechanical Engineering (MCIM)

Semester End Examination; Jan - 2017

Advanced Materials Technology

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, Selecting **ONE** full question from each **unit**.*

UNIT - I

1	a.	Explain how structure of the material relates to its engineering properties.	6
	b.	With a schematic representation explain development of a grain structure.	6
	c.	With a neat sketch explain edge dislocation and screw dislocation.	8
2	a.	Briefly explain the types of polymerization process.	6
	b.	Derive the longitudinal modulus of a composite considering is strain model.	6
	c.	Explain the factor on which properties of composites depend.	8

UNIT - II

3	a.	With a schematic representation explain squeeze casting process.	6
	b.	With a schematic representation explain fabrication of glass fibers.	6
	c.	With a schematic representation explain pultrusion process.	8
4	a.	Briefly explain in-situ processes for processing of composites.	4
	b.	With a schematic representation explain slurry infiltration process.	8
	c.	With a schematic representation explain different winding process.	8

UNIT - III

5	a.	With a flow chart explain the powder metallurgy process.	8
	b.	Explain characterization of metal powders.	12
6	a.	With a schematic representation explain water atomization process for producing metal powders.	8
	b.	Discuss the applications of powder metallurgy components.	8
	c.	Differentiate between HIP and CIP.	4

UNIT - IV

7	a.	Explain the importance of surfaces in engineering applications.	4
	b.	List the different techniques used in mechanical surface treatments and explain any two.	8
	c.	With a neat sketch explain chemical vapour deposition process.	8
8	a.	With a schematic illustration explain the surfaces structure of a metal.	10
	b.	With a neat sketch explain thermal wire spraying of a metal.	10

UNIT - V

9	a.	List the methods of producing nanomaterials and explain any two.	10
	b.	With a schematic representation explain the working principle of transmission electron microscope.	10
10	a.	With a schematic representation explain the working principle of atomic force microscope.	10
	b.	Explain the applications of nanotechnology.	10

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