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Pages: 2

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Regular Examination June 2023 (2019 Scheme)

Course Code: MET416

Course Name: COMPOSITE MATERIALS

Max. Marks: 100 **Duration: 3 Hours**

PART A

Answer all questions, each question carries 3 marks. Marks

1 What are composite materials? Give an example each of engineered and natural composite. (3)

2 What are the characteristic features of particulate composites? (3)

3 What is the role of coupling agents in composite fabrication? (3)

4 What are the limitations of using glass fibres as reinforcements in the fabrication of composite materials? (3)

5 Explain the difference between thermosetting and thermoplastic matrix materials. (3)

6 What is the difference between glass transition temperature and melting temperature for a semi-crystalline polymer? (3)

7 What are metal matrix composites? Give examples. (3)

8 What are the metal matrices mostly used in aerospace fields? Give reasons. (3)

9 What are the advantages of reaction bonding processes in the fabrication of ceramic matrix composites? (3)

10 Explain reaction bonding process. (3)

PART B

Answer any one full question from each module, each question carries 14 marks.

Module I

11 Explain the different types of bonding at the interface of engineered composites. (14)

OR

12 Explain the advantages and limitations of using composite materials in engineering applications. (14)

Module II

13 a) Discuss the fabrication process and characteristics of the following fibres (14)

i. Glass Fiber

ii. Carbon Fiber

OR

14 a) For any given engineering material being used as fibre reinforcement, how does the strength vary when we use it as the bulk material and when that material is used as fibres and whiskers? (7)

b) Explain why the fibres of polymeric and non-polymeric materials work as reinforcements in the fabrication of engineered composites. (7)

Module III

15 Explain the following of composite fabrication in detail (14)

i. Autoclave moulding

ii. Filament Winding

OR

16 With a neat sketch explain the Pultrusion process of polymer matrix composite fabrication. (14)

Module IV

17 Discuss the characteristics of metals used in the fabrication of engineered composites and their applications in engineering. (14)

OR

18 With a neat sketch explain the squeeze casting process. (14)

Module V

19 With a neat sketch explain the melt infiltration technique of ceramic matric composite fabrication. (14)

OR

20 With neat sketches explain the slurry impregnation process of composite fabrication. (14)

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