Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth semester B.Tech degree examinations (S) September 2020

Course Code: ME363

Course Name: COMPOSITE MATERIALS AND MECHANICS

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any three full questions, each carries 10 marks.

Marks

1	a)	What are the salient features required for matrix materials?	(4)
	b)	Explain about 1) Fibre pull out 2) Delamination 3) Fibre bridging 4) Debonding	(6)
2	a)	Compare between properties of metals and composites.	(4)
	b)	Write a short note about wettability. Explain about three different conditions of wetting.	(6)
3	a)	Explain about Ex-Pitch carbon fiber fabrication	(7)
	b)	List three advantages and three disadvantages of natural fibers	(3)
4	a)	Write a short note on wet jet spinning process for producing aramid fibers	(6)
	b)	What are the important application of aramid Fibers	(4)

PART B
Answer any three full questions, each carries 10 marks.

5	a)	Write a short note on common thermoset polymeric matrix materials.	(4)
	b)	With neat sketches explain manufacturing of laminated composite using prepreg	(6)
6	a)	Explain processing of thermoset matrix composites using spray technique.	(6)
	b)	List any four applications of polymer matrix composites	(4)
7	a)	What are the modifications required in casting process for improving the properties of metal matrix composites.	(4)
	b)	With neat sketches explain about In situ process by unidirectional solidification	(6)
8	a)	"Precipitation-hardenable alloy materials are used in the manufacture of metal matrix composites" Comment with proper examples.	(4)
	b)	Write a short note about diffusion bonding.	(6)

PART C
Answer any four full questions, each carries 10 marks.

9	a)	State and explain Tsai–Wu Failure Theory	(6)

	b)	State and explain the maximum strain theory for predicting the composite failure	(4)
10	a)	With neat sketches explain liquid infiltration process in ceramic matrix composites	(6)
	b)	Write short note about common ceramic matrix materials	(4)
11	a)	Calculate the fraction of the load carried by the fibres in two composites of glass fibres and epoxy matrix one of them containing 20% fibres by volume and the other one 60 %. Given that Elastic moduli of glass fibres and epoxy resin are 72 GN/m^2 and 3.6 GN/m^2 respectively.	(5)
	b)	Write short note about laser machining	(5)
12	a)	With the aid of neat sketch explain lanxide process	(5)
	b)	Describe the process of Hot Isostatic Pressing for making ceramic matrix composites.	(5)
13	a)	Explain about manufacture of ceramic matrix composites by reaction bonding method	(5)
	b)	Explain about pultrusion process for fabrication of ceramic matrix composites	(5)
14	a)	State and explain Tsai–Hill Theory	(6)
	b)	What are the assumptions in micromechanics studies of composites	(4)

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