

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Supplementary Examination, May 2020

Course: Composite Material
Program: B. Tech ASE
Course Code: MTEG 414

Semester: VIII
Time 03 hrs.
Max. Marks: 100

Instructions: Q.1-Q.5 are of multiple choice type. (5*2 Marks)
Q.6. is True/False with 10 sub questions carry 2 marks each (10*2 Marks)
Q.7-Q.8 are of short answer type with not more than 70 words (2*5 Marks)
Q.9-Q.12 are of long answer type with not more than 150 words (4*10 Marks)
Q.13 is of long answer type with not more than 250 words (20*1 Marks)

SECTION A

S. No.		Marks	CO
Q 1	Mechanical properties of composite material depend on a) Length of fiber b) Orientation of fiber c) Volume fraction of fiber d) All of the above	2	CO2
Q 2	Which of these method is suitable for making PMCs a) Diffusion bonding b) Pultrusion c) Chemical vapor deposition d) Sol-gel technique	2	CO2
Q3	The wettability of matrix is increased by the addition of a) Cobalt b) Magnesium c) Silicon d) Chromium	2	CO2
Q4.	Which of the following material is used as fiber in metal matrix composite a) Titanium b) Aluminum	2	CO2

	c) Silicon Carbide d) Magnesium		
Q5.	The manufacturing technique used for large production of polymer composite a) Hand lay up b) Spray lay up c) Filament winding d) None of the above	2	CO2
Q6.	State True/False for the following questions a) Composite materials are micro-scale combination of fiber and matrix. b) Fiber are weaker than matrix in composite material. c) Both PMCs and MMCs are used for high temperature applications d) In MMC matrix material is ceramic. e) For good impregnation the particle size of matrix must be smaller than fiber f) In composite material volume fraction of fiber must be less than 100% g) Alloys are same as composite material. h) MMC with high hardness suitable for wear resistance application. i) Composite materials are same as alloys. j) Cold isostatic pressing (CIP) uses inert gases as a means of applying pressure	20	CO1
Q 7	State the reason of using thermoset matrix in resin transfer and filament winding process of making composite material	5	CO4
Q 8	Differentiate between Compacting and Sintering process in Powder metallurgy.	5	CO3
Q 9	Difference between pultrusion and filament winding manufacturing process of PMC. How the fibre orientation is controlled in the filament winding process?	10	CO3
Q 10	Difference between hand lay up and spray-lup technique of making polymer matrix composite(do not draw the figure).	10	CO3
Q11	List the main steps in powder metallurgy process (do not explain) also list out the controlling parameters of blending process. OR Explain any two closed mold processing of making PMC and list out its advantage and disadvantages	10	CO2
Q 12	Explain the function of fibre and matrix in the composite. Give one example of each PMC, CMC, and MMC.	10	CO3
Q 13	Explain the hot pressing and sintering process of making CMC without diagram. Clear explains its advantage and disadvantages OR	20	CO4

	Explain the injection molding and resin transfer molding process of making polymer matrix composite. Clearly state the application of each process without diagram.		
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