Set - 1

UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2019

Course: Composite Material **Semester: VIII**
Program: B. Tech ASE **Time 03 hrs.**
Course Code: MTEG 415 **Max. Marks: 100**
Instructions: All questions compulsory

SECTION A

S. No.		Marks	CO
Q 1	Define composite material? Give an example of polymer matrix composite.	4	CO1
Q 2	Classify the composite on the basis of reinforcement phase, state the aspect ratio of each classification.	4	CO1
Q 3	Give reason for following question a) Alloys are not a composite material. b) Continuous reinforced composite material are not isotropic material.	4	CO3
Q 4	State the reason of causing inhomogeneity in the microstructure during stir casting process.	4	CO3
Q 5	List out the limitation of using carbon as a fibre, and matrix material in composite.	4	CO5
	SECTION B		
Q 6	Define volume fraction and weight fraction of composite, Express the transverse modulus of composite material in the term of volume fraction of fibre and matrix	10	CO4
Q 7	Mention the difference between lamina and laminate, support you answer with figure. Also state the possible failure mode in composites.	10	CO1
Q 8	Discuss the advantages and limitation of MMCs and CMCs.	10	CO4
Q 9	Differentiate between squeeze casting and stir casting manufacturing process of metal matrix composite. **OR** Explain the sol-gel technique of manufacturing carbon composites.	10	CO3
	SECTION-C		
Q 10	Explain the different liquid state process of manufacturing metal matrix composite. Clearly sate the application of each process.	20	CO2
Q 11	Explain the hot pressing and sintering process of making CMC. **OR** Explain the filament winding and pultrusion process of making polymer matrix composite. Clearly sate the application of each process.	20	CO2

Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

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SECTION A

S. No.		Marks	CO
Q 1	Define metal matrix composites (MMCs). Give names of common matrix material and reinforcement material used for making MMCs.	4	CO1
Q 2	Classify the composite on the basis of reinforcement phase, state the aspect ratio of each classification.	4	CO1
Q 3	Discus the advantage and limitation of Ceramic matrix composites	4	CO3
Q 4	State the reason of using thermoset matrix in resin transfer and filament process of making composite material.	4	CO3
Q 5	List out the controlling parameters of blending process of powder metallurgy.	4	CO3
	SECTION B		
Q 6	Define rule of mixture, Express the longitudinal modulus of composite material in the term of volume fraction of fibre and matrix	10	CO4
Q 7	Distinguish between solid state and liquid state processing of making MMCs. Briefly explain any one liquid state process of making MMC.	10	CO3
Q 8	Write down the application of CMC, and MMC composites. Also state the possible failure modes in lamina and laminate.	10	CO4
Q 9	Differentiate between Cold isostatic pressing (CIPing) and Hot isostatic pressing (HIPing) manufacturing process of ceramic matrix composite. **OR** Explain the chemical vapour deposition technique of making carbon fibre composite.	10	CO3
	SECTION-C		
Q 10	Explain the different solid state process of manufacturing metal matrix composite.	20	CO2
Q 11	Explain the hot pressing and sintering process of making CMC. **OR** Explain the injection molding and resin transfer molding process of making polymer matrix composite. Clearly state the application of each process	20	CO2