

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2021

Programme Name : B. Tech. (Mechanical)

Course Name : Nanotechnology

Course Code : MEMA 4008P

Nos. of page(s) : 02

Semester : VI

Time : 03 hours

Max. Marks : 100

Instructions:

SECTION A

S. No.		Marks	CO
Q 1	Write down any 2 applications of ceramics.	5	CO1
Q 2	Describe any two differences between Frenkel and Shottky defects in respect to ceramics.	5	CO1
Q 3	What are copolymers? Write down their types as well.	5	CO2
Q 4	Mention any two differences between an interface and an interphase.	5	CO3
Q 5	Define Laminar composites and Sandwich Panels.	5	CO3
Q 6	State any three major functions of the matrix phase.	5	CO3

SECTION B

Q 7	Define polymer blends and its various categories.	10	CO1
Q 8	Evaluate the minimum cation-anion radius ratio for a triangular configuration having a coordination number of 3.	10	CO2
Q 9	Write down the steps (with diagram) followed in the polymer infiltration and pyrolysis (PIP) process with respect to ceramic matrix composites (CMC).	10	CO2
Q 10	Consider a NaCl structure with ionic radius of sodium and chlorine being 0.102 and 0.181 nm, respectively. Atomic weight of sodium and chlorine being 22.99 and 35.45 g/mol. Evaluate the theoretical density of this crystalline NaCl ceramic material in grams/cm ³ .	10	CO3
Q 11	Define and plot all the Glass processing points with proper labelled diagram.	10	CO3

SECTION-C

Q 12	<p>Explain in detail about any three glass processing techniques with properly labelled diagrams.</p> <p style="text-align: center;">OR</p> <p>Describe all the techniques used for the processing of metal matrix composites (MMC). Explain any three in detail with neat diagrams.</p>	20	CO4
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