Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Course: Composites & Nanocomposites **Semester: VII**
Programme: B. Tech (MSENT)
Course Code: MTEG 413
Time: 03 hrs. **Max. Marks: 100**
Instructions:

SECTION A

S. No.		Marks	CO
Q 1	Provide four examples of modern composites and give usage of each	**4**	**CO1**
Q 2	Explain the relationships between the three classes of engineering materials showing the evolution of composites in a venn diagram format	**4**	**CO2**
Q 3	What do you mean by nano range and 2D nanomaterials? Provide two interesting examples of 2D nanomaterials	**4**	**CO1**
Q 4	Briefly explain the importance of 'interface' and 'interphase' with respect to composite materials	**4**	**CO1**
Q 5	Provide three applications of nanocomposites in oil and gas pipeline, and automobile industry	**4**	**CO1**

SECTION B

Q 6	Discuss and provide examples for the various classification of nanomaterials	**10**	**CO3**
Q 7	Discuss thoroughly and list various possible advantages of nanocomposite materials	**10**	**CO2**
Q 8	Explain the importance of "composites have very good environmental durability", in terms of building and construction applications	**10**	**CO4**
Q 9	Explain the importance of 'reinforcements' and 'matrices' of a composite material. What could be the potential applications of nanocomposites in the future (OR) Provide good notes on 'carbon black', 'fullerenes' and CNTs' along with applications.	**10**	**CO3**

SECTION-C			
Q 10	Discuss thoroughly about polymer matrix nanocomposites. Mention few important properties of polymer matrix nanocomposites. Provide examples as and when necessary	**20**	**CO4**
Q 11	Discuss thoroughly about metal matrix composites. Also, provide notes on 'thermosets' and 'thermoplastics' along with examples **OR** What are quantum dots? Discuss thoroughly about the Sol Gel technique	**20**	**CO4**