Name:

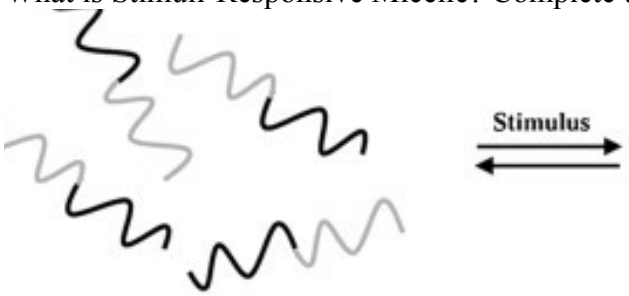
Enrolment No:

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

Course: Biomaterials/MTEG 303 **Semester: 6th**
Program: B.Tech – Material Science and Nanotechnology
Time: 03 hrs. **Max. Marks: 100**

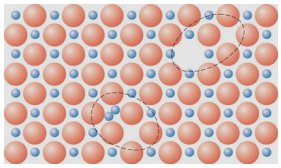
Instructions: Internal choices available for Q10 or Q11

SECTION A

S. No.		Marks	CO
Q 1	A brittle material need some flexibility for application in biomedical areas. How will you insert the flexibility?	5	CO1
Q 2	What is Stimuli-Responsive Micelle? Complete the figure: 	5	CO2
Q 3	How will you track the flow of blood by using Nano particle, explain briefly with example?	5	CO2
Q 4	How dendrimers direct the drug into target cell. Complete the following.	5	CO1

SECTION B

Q 5	Can you detect the virus through Silicon Nanowires? Provide Brief explanation with figure.	10	CO3

Q 6	Define the mechanism of Hydrogen Embrittlement on Titanium and how its effect the overall application as biomaterial?	**10**	**CO2**
Q 7	What are the names of defects of encircled areas? How they affect the overall property of biomaterial? 	**10**	**CO4**
Q 8	Discuss the unique characteristics of polymeric micelles. Explain diagrammatically the mechanism of micelles for drug delivery.	**10**	**CO1**
	SECTION-C		
Q 9	Define the challenges associate with the following polymers to be used as biomaterial: i. Chitosan ii. Cellulose iii. Collagen iv. Poly Caprolactone v. Polylactic Acid	**20**	**CO5**
Q 10	Describe the nature of metals and alloys use for Total Knee Replacement? What types of the material can be used for : i. Stress Shielding ii. Wear Reduction iii. Femoral component iv. Patellar Component v. Plastic Insert	**20**	**CO3**
	OR		
Q 11	Explain the following with example and application. i. Bio inert Ceramics ii. Bioactive Ceramics iii. Bioreabsorbable Ceramics		**CO4**