Name: **Enrolment No:**	UPES

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

Programme Name: B.Tech (GIE, Mechanical, APE Gas, Civil, CE+RP, FSE) **Semester : V**
Course Name : Nanotechnology – A Maker's Course **Time : 03 hrs**
Course Code : PHYS 3203 **Max. Marks: 100**
No. of page(s) : 01

Instructions: Your answer should be concise and to the point.

SECTION A (All questions are compulsory)			
Q1	What do you understand by the term self-cleaning windows?	**[4]**	**CO4**
Q2	What is the use of Faraday's cup in electron microscopy?	**[4]**	**CO3**
Q3	How nanomaterials can be used in drug delivery?	**[4]**	**CO4**
Q4	What is Magnetron sputtering?	**[4]**	**CO2**
Q5	Explain in brief the Photovoltaic effect.	**[4]**	**CO1**
SECTION B (Question 9 has internal choices.)			
Q6	"The properties of materials undergo drastic change when we go from bulk to nano". Explain with the help of some examples.	**[10]**	**CO1**
Q7	Discuss the working of Scanning Tunneling Microscope (STM).	**[10]**	**CO3**
Q8	Write a note on the construction and working of Scanning Electron Microscope.	**[10]**	**CO3**
Q9	Discuss in detail sol-gel method for the synthesis of nanomaterials. **OR** Discuss in detail the co-precipitation method for the synthesis of nanomaterials.	**[10]**	**CO2**
SECTION-C (Question 11 has internal choices.)			
Q10	(a) Write in brief on the properties and synthesis of small carbon clusters. (b) Compare the various Physical and Chemical routes for the synthesis of nanomaterials.	**[10]** **[10]**	**CO1** **CO2**

Q11 (a)	(i) Explain the role on Nanotechnology in food and cosmetics industry. (ii) "Exposure to nanomaterials is dangerous to human health and ecosystem". Explain.	**[10]**	**CO4**
	OR	**[10]**	**CO4**
Q11 (b)	(i) How the CNTs are revolutionizing the distribution of power in Power Transmission Lines.	**[10]**	**CO4**
	(ii) Discuss any two methods to split water with sunlight for hydrogen production.	**[10]**	**CO4**