

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: Nanomaterials & Applications
Program: B.Sc Physics (H)
Course Code: PHYS 3015D

Semester: VI
Time : 03 hrs.
Max. Marks: 100

Instructions:

SECTION A
(All questions are compulsory)

S. No.	Question	Marks	CO
Q 1	What is the use of Faraday's cup in electron microscopy?	4	CO3
Q 2	"No more Spiderman window cleaner". Explain.	4	CO1
Q 3	Differentiate between Ostwald's ripening and agglomeration.	4	CO2
Q 4	Which material is generally used for the generation of electrons in an electron microscope and why?	4	CO3
Q 5	"Sputtered films have the same concentration as that of the target material". Why?	4	CO2

SECTION B
(All questions are compulsory. Q9 has internal choices.)

Q 6	Discuss in brief the MEMS and NEMS technology.	10	CO1
Q 7	Write a note on the process of thermal evaporation system for the synthesis of thin film with the help of a neat and labelled diagram.	10	CO2
Q 8	Explain the changes in the density of states on going from a bulk crystal to a nanocrystal to molecule with the help of a neat and labeled diagram.	10	CO3
Q 9	Discuss the different processes that are involved in the preparation of a solid sample to be characterized by TEM. OR Write a note on the principle and working of an Atomic Force microscope.	10	CO2

SECTION-C
(All questions are compulsory. Q11 has internal choices.)

Q 10	(i) "The presence of impurities affects the properties of materials". How? (ii) Write a note on the radiative processes that occurs during interaction of matter with energy.	20	CO3
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Q 11	<p>(i) Explain the role on Nanotechnology in food and cosmetics industry.</p> <p>(ii) “Exposure to nanomaterials is dangerous to human health and ecosystem”. Explain.</p> <p style="text-align: center;">OR</p> <p>(i) How the CNTs are revolutionizing the distribution of power in Power Transmission Lines.</p> <p>(ii) How is nanotechnology used in solar cells?</p>	10 + 10	CO4