DAG-003-0498002 Seat No. _____

B. Sc. / M. Sc. (Applied Physics) (Sem. VIII) (CBCS) Examination

April - 2022

Namomaterials - I : Paper - VI

(Synthesis & Types) (Core - VI) (New Course)

Faculty Code : 003
Subject Code : 0498002

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) All questions are compulsory.
(2) Numbers in the right margin indicate marks.

1 Write answer of short questions (Two marks each) **14**

(1) What is Sol-Gel method?
(2) Give the name of precursors used in synthesis of metal and metal oxide nanoparticles.
(3) Define 0-D and 2-D.
(4) Draw the diagrams for three basic nucleation modes in film growth.
(5) What is meant by homo-epitaxial and hetero-epitaxial film growth?
(6) Define quantum confinement.
(7 Draw the schematic diagram illustrating the homogeneous nucleation and subsequent growth.
(8) Define nanoscience and nanotechnology.
(9) Write the application of CNT.
(10) What are advantages of self assembled monolayer (SAM)?

2 Write the detailed answers of following any two questions : **14**

(1) Write short note on RF-DC sputtering.
(2) Describe the types of CVD.
(3) Describe various advanced nano ceramics and their applications.
(4) Describe various nanomaterials for consumer applications.

3 Write the detailed answers of following any two questions : **14**

(1) Describe the synthesis of metal nanoparticles with suitable example and chemical reactions.

(2) Write the synthesis of TiO_2 nanoparticles using Aerosol synthesis method.

(3) What is kinetically confined in synthesis of Nanoparticles, how can we achieve using micro emulsion method.

4 Write the detailed answers of following any two questions : **14**

(1) Define semiconductor nanoparticles. Describe the synthesis of semiconductor nanoparticles.

(2) Explain the vapour liquid solid growth of Si nanowire using Au catalyst.

(3) Describe the synthesis of SiO_2 nanoparticles using sol-gel method.

5 Write the detailed answers of following any two questions : **14**

(1) Describe the Sol-gel processing of nanostructured film with suitable example.

(2) Describe various lithography techniques for growth of 1-D nanostructures.

(3) Write short note on electrospinning.

(4) Explain the ALD with neat diagram.