BACHELOR OF SCIENCE (CBCS-2018 COURSE)
T. Y. B. Sc. Sem-VI :SUMMER- 2022
SUBJECT : PHYSICS : PHYSICS OF NANO MATERIALS

Day : Thursday
Date : 14-07-2022

S-18503-2022

Time : 11:00 AM-02:00 PM
Max. Marks : 60

N.B.:

1) All questions are **COMPULSORY.**
2) Figures to the **RIGHT** indicate full marks.
3) Draw neat labeled diagrams **WHEREVER** necessary.

Q. 1 Attempt any **Two** of the following. **(12)**

(a) Explain the DC sputtering with diagram to synthesize nanomaterial
(b) State and prove the Bragg's diffraction condition with diagram
(c) Explain with diagram the high energy ball milling method for making the nanomaterials

Q. 2 Attempt any **Two** of the following. **(12)**

(a) Explain the Top-down and Bottom-up approach to synthesize the nanomaterials with diagram.
(b) Describe UV-Vis spectrometer with diagram
(c) Describe with diagram the ultrasonic spray pyrolysis method to synthesize the nanomaterials

Q. 3 Attempt any **Two** of the following. **(12)**

(a) Explain Diamagnetic, Paramagnetic and ferromagnetic materials
(b) Describe Transmission Electron Microscope (TEM) with diagram
(c) Explain the classification of nanomaterials with diagram on the basis of dimension.

Q. 4 Attempt any **Three** of the following. **(12)**

(a) Why the properties of nanomaterials are different as compared to bulk? Explain.
(b) Explain with diagram the physical vapour deposition method to produce the nanomaterials.
(c) Describe with diagram the sol-gel method to synthesize nanomaterials
(d) Explain the I-V characteristic of quantum dot with diagram.

Q. 5 Attempt any **Four** of the following. **(12)**

(a) Explain the variation of energy gap with particle size in case of semiconductor nanoparticles.
(b) Explain the electroluminescence with diagram observed in LED.
(c) Explain the application of nanomaterials in the field of space or defence.
(d) Explain the behaviour of ferromagnetic materials with diagram below 100 nm.
(e) Explain the thermoluminescence with diagram.
(f) What do you mean by nanomaterials? Explain with examples

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