

T.Y.B.SC. SEM – VI (2014 Course) : SUMMER - 2019
SUBJECT : PHYSICS : ELECTIVE – II : PHYSICS OF NANOMATERIALS

Day : Saturday
Date : 27/04/2019

S-2019-1046

Time : 03.00 PM To 05.00 PM
Max. Marks : 40

N.B.

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the **RIGHT** indicate **FULL** marks.
 - 3) Draw neat diagrams **WHEREVER** necessary.
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Q 1. Attempt any **Two** of the following. **(10)**

- (a) Explain with diagram the physical vapour deposition method to produce the nanomaterials.
- (b) Explain the synthesis of nanocrystalline ZnO with diagram.
- (c) Explain (a) zigzag CNT (b) armchair CNT and c) helical CNT with diagram.

Q 2. Attempt any **Two** of the following. **(10)**

- (a) Explain the variation of energy gap with particle size in case of semiconductor nanoparticles.
- (b) Obtain an expression for the Scherrer formula. Draw the diagram.
- (c) What is photoluminescence? Explain the possibilities of photoluminescence mechanisms with diagram.

Q 3. Attempt any **Two** of the following. **(10)**

- (a) Describe with diagram the sol-gel method to synthesize nanomaterials
- (b) Explain the application of nanomaterials in the field of tissue repair.
- (c) Describe UV-Vis spectrometer with diagram

Q 4. Attempt any **Two** of the following. **(10)**

- (a) Explain the behaviour of ferromagnetic materials with diagram below 100 nm.
- (b) Describe the Cathodoluminescence.
- (c) Why the properties of nanomaterials are different as compared to bulk? Explain.
- (d) Explain the application of nanomaterials in solar cell with diagram.

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