Roll No. .....

Y–568

M. Tech. (Second Semester)
EXAMINATION, May/June, 2015

OPTOELECTRONICS AND LASER TECHNOLOGY

Paper First (OE—21)

(Physics of Advanced Materials)

Time : Three Hours] [*Maximum Marks : 100*

Note : Attempt *one* question from each Unit. All questions carry equal marks.

Unit—I

1. Describe the size dependent properties of nanoparticles. Explain the methods of synthesis of nanoparticles.

Or

What is Carbon Nanotube ? What are special properties of carbon nanotube ? What are nanostructured crystals ?

Unit—II

2. What is semiconductor quantum dot ? Can a quantum dot be made with a metallic element ? How is a quantum confinement manifested in various measurements ?

Or

Discuss in brief microelectromechanical system and nano-electromechanical system.

Unit—III

3. Describe the criteria for selection of material requirement for light emitting diode.

Or

Describe the classification of Electroluminescence. Draw the inverted structure of ACTFEL device and explain its working with the help energy band diagram.

Unit—IV

4. Describe the working of atomic beam epitaxy method for thin film deposition and list its merits and demerits.

Or

Describe the basic principle of IR spectrometry and explain the correlation of IR spectra with molecular structure.

Unit—V

5. (a) Describe high resolution X-ray diffraction and double crystal diffraction.

(b) How Hall effect is used to determine carrier density and Hall mobility ?

Or

Explain the basic principle of ellipsometer and explain how *n-k* measurement is accomplished.

100