Printed Pages : 2 TOE11

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0911 Roll No.

B.Tech.

(SEM VII) ODD SEMESTER THEORY EXAMINATION 2009-10

NANO TECHNOLOGY

Time : 3 Hours] *[Total Marks : 100*

Note : *(i) Attempt all questions.*
*(ii) All questions carry **equal** marks.*
(iii) Be precise in your answer.
(iv) No second answer book will be provided.

1 Attempt any **four** parts of the following : 5×4=20

(a) Discuss the possibility of observing the negative differential conductivity effect in a bulk semiconductor crystal.

(b) Define Bravais lattice and describe the condition when two Bravais lattice are equivalent.

(c) What will happen when exciton interacts with another excition ?

(d) Enlist the applications of Nano technology.

(e) What are the applications of crystallography in material engineering ?

(f) Write a note on optical spectroscopy.

2 Attempt any **two** parts of the following : 10×2=20

(a) Describe transmission electron microscope. Also write the applications and drawbacks of TEM. What are the differences between SEM and TEM ?

(b) Define and explain the Nano clusters. What is magnetic Nano particles ? Describe its properties and its applications.

(c) Write a note on synthesis of Nano particles.

3 Attempt any **two** parts of the following : 10×2=20

(a) Is a carbon Nano tube a fullerene ? Explain in detail. Enlist the properties of carbon Nano tubes.

(b) What kind of ring structures are present in C_{60} ? Discuss its superconductivity properties.

(c) Give the industrial applications of carbon Nano tubes in detail.

4 Attempt any **two** parts of the following : 10×2=20

(a) What are solid disordered Nano structures ? Also discuss their properites.

(b) Define magnetic Nano particles. Enlist its properties and explain in detail the applications.

(c) (i) What are Ferro-fluids ? Discuss their applications.

(ii) Write a note on Nano devices.

5 Attempt any **two** parts of the following : 10×2=20

(a) Write in detail about NEMS.

(b) Write notes on (i) Excitons (ii) Infrared Detectors.

(c) Write notes on (i) applications of X-ray spectroscopy, (ii) molecular and super-molecular switches.
