Printed Pages-1 Roll No. EOE042

B.TECH.

THEORY EXAMINATION (SEM–IV) 2016-17

NANO SCIENCES

Time : 3 Hours *Max. Marks : 100*

Note : *Be precise in your answer.*

SECTION – A

1 **Explain all parts in short.** **[2x10=20]**

a) Nano diamond
b) Quantum dots
c) Fullerenes
d) Luminescence
e) Face cantered cubic nanoparticles
f) Lattice Vibrations
g) Excitons
h) Magic Numbers
i) Fermi Surfaces
j) Trap levels

SECTION-B

2 **Attempt any FIVE questions from this section.** **[10x5=50]**

a) What are the carbon nanotubes and discuss its various properties.
b) Give a detailed account of Quantum dot laser super conductivity.
c) Write the interactions of electron with the materials and discuss the necessity of gold coating prior to SEM analysis for insulating samples,
d) Give a detailed account of Atomic force microscopy and its application in nano-science.
e) Write the various growth techniques of nanomaterials and give a detailed account of thermal evaporation technique.
f) What is Graphene? Discuss its applications in nanotechnology.
g) What are localized particles, Give a detailed account of donors, accepters and deep traps.
h) Write the working principal of Raman Spectroscopy and its various applications in nanoscience.

SECTION-C

Attempt any TWO questions from this section. **[15x2=30]**

3. Deduce the time dependent Schrodinger Wave Equation.
4. Discuss in detail about inert gas and super fluid clusters.
5. Define microscope and give a detailed account of transmission electron microscopy.