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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 centered 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.