





v) Why a CNT does not fracture even if they are bent severely ? 3

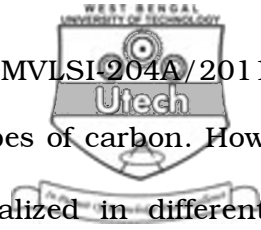
vi) Give a concept of a nano-computer made out of CNT. 3

vii) What is Jellium model of nano-cluster ? 3

2. What is quantum size effect ? How is the electron energy modified in a system where the electron is confined in one direction ? Write down the expressions for the electron densities and density of states in bulk, 2D, 1D and 0D systems. 3 + 3 + 8

3. a) Describe single electron tunneling process with the help of appropriate QD circuit arrangement. Hence explain Coulomb blockade.

b) What is magnetoresistance ? Describe the physical reasoning of fall of resistance of CNT in dc magnetic field. 6 + 4 + 4



4. a) What is allotropy ? Name the allotropes of carbon. How a carbon nanowire is physically realized in different configurations with reference to its chirality ?
- b) What is bulk nanostructured material ? How such a disorderd structure can be fabricated by electrodeposition process ? 2 + 1 + 6 + 5
5. Write short notes on the following : 7 + 7
- a) Separation of metallic and semiconducting CNTs from a cluster of synthesized Nanotubes.
- b) Electrophoresis.

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