Total No. of Questions : 12]

SEAT No. :

P1414

[Total No. of Pages : 2

[4759]-130

B.E. (Electronics)

NANOTECHNOLOGY IN ELECTRONICS

(2008Course) (Elective-IV) (Semester-II)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q,7 or Q.8, Q.9 or Q.10 and Q.11 or Q.12.***
5) ***Assume Suitable data if necessary.***

SECTION-I

Q1) a) Explain any four tools used for making Nanostructures. **[8]**

b) List out the limitations of semiconductor technology in the context of nanostructures. **[8]**

OR

Q2) a) Explain optical properties of semiconducting nanoparticles. **[8]**

b) Explain molecular modeling of Nanoparticles. **[8]**

Q3) a) Explain the principle of single electron transistor device. **[8]**

b) Explain silicon Nanocrystal Non-volatile memory bit cell. **[8]**

OR

Q4) a) Draw and explain the process flow for integrating nanocrystal memory with standard CMOS technology. **[8]**

b) Explain different nano CMOS devices with their application. **[8]**

Q5) a) Explain with schematic apparatus to make metal nanoparticles. **[9]**

b) Explain applications and properties of carbon Nanotube. **[9]**

OR

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Q6) a) Write short notes on the following. **[9]**

i) Nature of Carbon Bond.

ii) Nanoclusters.

b) Explain Structure and superconductivity of C_{60}. **[9]**

SECTION II

Q7) a) What are different types of molecular switches? Explain the application of any one. **[8]**

b) Explain any two applications of a Cantilever device under MEMS. **[10]**

OR

Q8) a) What are the differences between mechanical behavior of micro-machines and macro-machines? What are the challenges and remedies,while design such systems? **[10]**

b) Explain the challenges while designing NEMS. **[8]**

Q9) a) Explain Atomic Lithography while fabricating NEMS. **[8]**

b) Describe the functioning of Transmission Electron Microscope. **[8]**

OR

*Q10)*a) Explain briefly the any one of the novel dielectric nano-material for future transistors. **[8]**

b) Explain how it is possible to control and manipulate light in nano- materials used as communication channel. **[8]**

Q11) Write Short notes on the following. **[16]**

a) Generation of current in photovoltaic cell.

b) Molecular motors

OR

*Q12)*a) Explain the construction and application of any one sensor using nano-structured material. **[8]**

b) Explain the role of Nano material in Biomedical applications. **[8]**