

**B.TECH. IN ELECTRONICS AND
COMMUNICATION ENGINEERING (BTECVI)**

Term-End Examination

June, 2013

BIELE-007 : NANO - ELECTRONICS

Time : 3 hours

Maximum Marks : 70

Note : (i) *Attempt any seven questions.*
(ii) *All questions carry equal marks.*

1. Discuss the challenges in nano-electronics for fabrication of nano devices. 10

2. (a) What is nanolithography ? And discuss the difficulties in nanolithography for practical implementation. 2x5=10
(b) Describe resonant tunneling devices.

3. (a) Explain different types of deposition techniques for nano scale devices. 2x5=10
(b) Explain 'hot electron effect'.

4. Discuss the working principle of single electron transistor with suitable diagram and also its input and output characteristics. 10

5. (a) Discuss the difference between Fin FET and vertical MOSFET. $2 \times 5 = 10$
(b) Describe the principle of strained devices.
6. (a) Explain the phenomenon of energy quantization. $2 \times 5 = 10$
(b) What is coulomb blockade ?
7. Discuss the effect of down scaling the MOSFET dimensions up to few nm. 10
8. (a) Discuss the properties of heterostructure based devices. $2 \times 5 = 10$
(b) Explain the principle of resonant diode and its application.
9. (a) Discuss the electrical properties of carbon nano tubes. $2 \times 5 = 10$
(b) Explain the input output characteristics of CNFET.
10. (a) What is spin relaxation mechanisms ? $2 \times 5 = 10$
(b) Discuss the working principle of spin FET.
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