No. of Printed Pages : 2

BIELE-007

00565

B.Tech.-VIEP-ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

June, 2019

BIELE-007 : NANO-ELECTRONICS

Time : 3 hours *Maximum Marks : 70*

*Note : (i) Attempt **any seven** questions.*

*(ii) **All** questions carry **equal** marks.*

(iii) Assume suitable missing data if any.

---

1. (a) Explain the concept of multiple gates in multiple gates MOSFET, mentioning their significance. 6

   (b) Explain working of FinFETs with diagrams. 4

2. Explain construction and working of vertical MOSFET's in detail. 10

3. Explain the basic principle of operation of single electron devices . Discuss quantum wells in quantum structures. 10

4. Explain Coulomb blockade and coulomb staircase. 10

5. Define tunneling, power density and hot electron effects in detail. 10

6. Explain short channel devices and short channel effects in context with MOS based devices. 10

7. Draw the internal structure of MOSFET and show oxide layer thickness and its role in threshold voltage. 10

8. (a) What are the interconnect issues ? How do interconnects play an important role in parasitics offered by device ? 5

   (b) Discuss Si-Ge heterostructure based devices 5

9. (a) Define type III - V and II - VI compounds and heterostructures based on it. 5

   (b) Explain resonant tunneling devices. 5

10. Discuss spintronics and its role in nano electronics. Explain the characteristics of spin based devices. 10