

Code: 5G375

IV B.Tech. I Semester Supplementary Examinations January 2022

Nano Electronics

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. a) Explain the historical milestones in the saga of nano. 7M
- b) If nature is full of nano, what limits us from making nano material or nano devices? 7M

OR

2. a) Every property possessed by bulk materials is also possessed by nano objects. So, how can one study nano objects uniquely? 7M
- b) How will nano technology work if positioned atoms and molecules do not stay at the specific location? 7M

UNIT-II

3. a) How is quantum confinement manifested in various measurements? 7M
- b) How do you correlate absorption spectra with size of quantum dot? 7M

OR

4. a) What are the different types of quantum dots investigated? 7M
- b) How do you make biocompatible quantum dots? 7M

UNIT-III

5. Write short notes on:
 - a. Short channel MOS Transistor?
 - b. Split gate transistor?
 - c. Electron wave transistor?
 - d. Quantum cell Automata (QCA)?
 14M

OR

6. a) Explain the principle operation of Electron Spin Transistor. 7M
- b) Outline the device applications of quantum dot arrays 7M

UNIT-IV

7. Draw and explain the basic configurations of RTBT, FET-RTD and SET. 14M

OR

8. a) Explain the Principle of the Single - Electron Transistor(SET) 7M
- b) Draw and explain the Inverter and OR gates based on RTDs. 7M

UNIT-V

9. a) What does a nanoelectronic interface look like? And explain each of interface. 8M
- b) Explain how reliability as limiting factor in integrated electronics. 6M

OR

10. a) How parameter spread as limiting effect in ICs 6M
- b) Explain the degree of parallelism performance and complexity of Information cube of information processing systems. 8M
