CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐ **17EC551**

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022
Nano-Electronics

Time: 3 hrs.   Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. State Moore's Law. Apply Moore's law to explain continued miniaturization in field of electronics. **(10 Marks)**
     b. Explain in detail about plasma assisted deposition processes. **(10 Marks)**

OR

2 a. Discuss in brief about lithographic processes related to Top-down processes. **(10 Marks)**
     b. Classify conductors, insulators and semiconductors based on electronic properties. **(10 Marks)**

Module-2

3 a. Discuss the principle of quantum confinement in semiconductor Nanostructures. **(10 Marks)**
     b. Explain about Field Ion Microscopy (FIM) **(10 Marks)**

OR

4 a. Explain the working principle of Bragg's law of x-ray difractometer with a neat sketch. **(10 Marks)**
     b. Describe about super lattices related to Quantum confinement. **(10 Marks)**

Module-3

5 a. Explain about quantum Hall effect. **(10 Marks)**
     b. Explain the fabrication technique of
        i) Cleaved edge overgrowth **(05 Marks)**
        ii) Growth on vicinal substrate. **(05 Marks)**

OR

6 a. Discuss in brief about resonant tunneling. **(10 Marks)**
     b. Write a short note on :
        i) Electrostatically Induced dots and wires **(05 Marks)**
        ii) Strain induced dots and wires. **(05 Marks)**

Module-4

7 a. Classify and describe different types of Carbon Nanotubes. **(10 Marks)**
     b. Design Carbon nanotubes using chemical vapour deposition method. **(10 Marks)**

OR

8 a. Explain about field effect transistor made from carbon nanotubes. **(10 Marks)**
     b. Discuss in brief about electrical properties of carbon nanotubes. **(10 Marks)**

Module-5

9 a. Explain about the working principle of injection lasers. **(10 Marks)**
     b. Explain the nanosensous based on quantum size effects. **(10 Marks)**

OR

10 a. Explain the working principle of quantum cascade lasers. **(10 Marks)**
      b. Explain the nanosensors based on physical properties. **(10 Marks)**

* * * * *