



- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.

1. a) Discuss scanning electron microscope with proper diagram. 7
- b) Write short notes on. 6
- i) Nano CAD
- ii) Nano building blocks.

OR

2. a) Write short note on RASTER SCAN in scanning probe microscopes. 5
- b) Explain DIP PEN Lithography. 8
3. a) Write short notes on Semiconductor memories. Explain flash memory. 7
- b) Define Ferroelectric materials. Why high-K-dielectric materials suitable for future transistors 7

OR

4. a) Write short note on Si-Nano-crystal memory. 7
- b) What are the types of non-volatile memory? What is the role of floating gate in MOSFET? 7
5. a) Write short note on Carbon nanotubes & applications with diagram. 7
- b) Explain Quantum wells, Quantum wires and Quantum dots with diagram. 6

OR

6. a) Explain probability clouds for electrons in small transistors with diagram. 6
- b) Explain HOMO & LUMO with energy level diagrams. 7

7. a) Explain optical lithography with diagram. 7
b) Discuss the modelling of a QUANTUM DOT in terms of a molecule between two contacts. 6

OR

8. a) Discuss molecular switch using GOLD electrodes. 6
b) Discuss Different NANO SENSORS with suitable diagram. 7
9. a) Write short note on NANOBOT. 6
b) Explain chemical SENSOR with diagram. 7

OR

10. a) Explain how a molecule can exist in two different states, 0'S and 1'S acting as switch. 5
b) Explain electrochemical SENSORS with diagram. 8
11. a) Write short notes on **any three**. 14
i) Photofragmentation.
ii) Electronic NOSE.
iii) 'PARTICLE in a BOX' model.
iv) Nanoelectronics Applications.

OR

12. Write short notes on **any three**. 14
i) Cross BARS & Addressing in NANO.
ii) SINGLE ELECTRON Transistor.
iii) Different NANOTECH Applications.
iv) C₆₀ & Applications.
