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**ELS 504**

**Third Semester M.Sc. Degree Examination, Dec. 2018/Jan. 2019**  
**ELECTRONICS**  
**Nano Electronics**

Time : 3 Hours

Max. Marks : 70

**PART – A**

Answer **all** questions.

**(5×2=10)**

1. a) What is nanoscience and nanotechnology ?
- b) What is bottom up approach ?
- c) Mention any four applications of nanotechnology.
- d) What are the different types of nanolayers characterization tools ?
- e) What is the tunneling phenomenon ?

**PART – B**

2. a) Explain the working principle of high energy ball mill process.
- b) Explain the working principle of Physical Vapour Deposition (PVD) with neat diagram. **(10+10)**

**OR**

3. a) Explain the working principle of Sol Gel process with neat diagram.
- b) Explain the working principle of Chemical Vapour Deposition (CVD). **(10+10)**
4. a) Explain the working principle of AFM with neat diagram.
- b) Explain the working principle of Profilometer with neat diagram. **(10+10)**

**OR**

5. a) Explain the working principle of Scanning Electron Microscopy (SEM).
- b) With neat diagram explain the working principle of X-Ray Diffraction (XRD). **(10+10)**

**P.T.O.**



6. a) Explain the working of carbon nano transistors with its applications.  
b) Write a short note on Single Electron Transistor (SET). **(10+10)**

OR

7. a) Explain the operating principle of Resonant Tunneling Diode with neat diagram.  
b) Explain operating principle and structure of quantum cascade laser. **(10+10)**
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