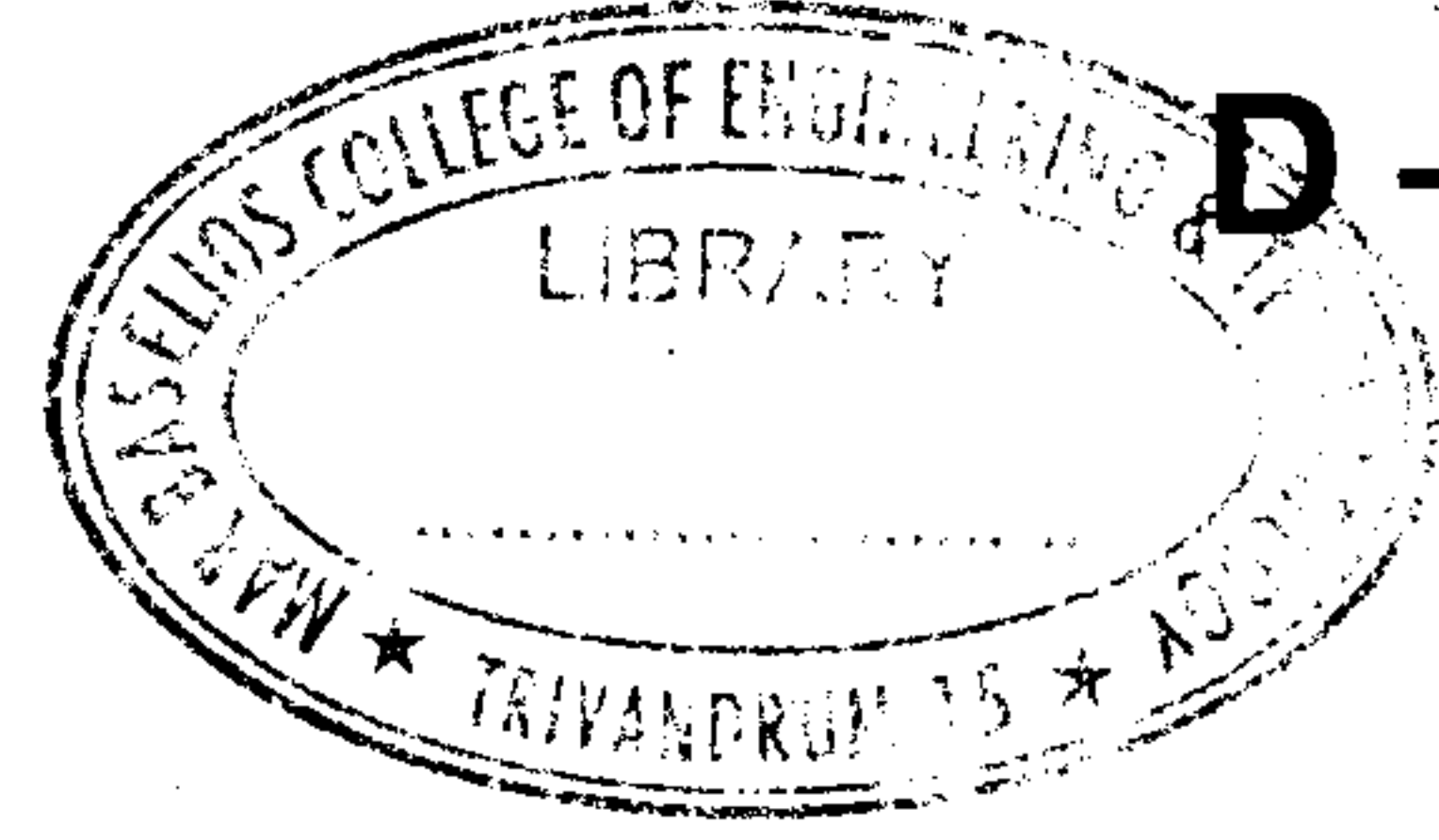




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D – 3522

Reg. No. :

Name :

Eighth Semester B.Tech. Degree Examination, December 2017
08.801 : NANOELECTRONICS (TA)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **4** marks.

1. Explain how the various specimen interactions are used in TEM.
2. Explain the advantages of laser ablation.
3. Explain how RF sputtering is different from DC sputtering.
4. Briefly explain the two different basic approaches in nano layer fabrication. Give examples.
5. A 2.5 eV electron is to be confined in a square quantum dot of side L. What should L be in order for the electron's energy level to be well quantized ?
6. Prove DOS function in 2D semiconductor is constant.
7. Explain briefly hot electron transistor.
8. List some advantages of Multiple Quantum well lasers.
9. Obtain Current – Voltage characteristic of RTD.
10. Explain Coulomb blockade effect.

P.T.O.



PART – B

Answer **any 2** questions from **each** Module. **Each** question carries **10** marks.

Module – 1

11. Briefly describe the process of Ion implantation.
12. Explain the operating principle of AFM.
13. Briefly explain the operation of SEM with appropriate diagrams and specimen interactions.

Module – 2

14. Prove density of state function, $\rho_{3D}(E) = (V(2m / \hbar^2)^{3/2} E^{1/2}) / 2\pi^2$.
15. Write notes on :
 - a) Super lattice
 - b) Energy band transitions in quantum wells.
16. List and explain the commonly used characteristics lengths in mesoscopic systems.

Module – 3

17. List the desirable properties of bipolar junction transistor and hence explain how this is achieved in heterojunction bipolar transistors.
 18. a) Compare homo junction and DH lasers.
b) List the advantages of GRINSCH lasers.
 19. Write notes on :
 - a) NEMS
 - b) Quantum dot lasers.
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