35073

M.Sc DEGREE EXAMINATION, OCTOBER 2015.

THIRD SEMESTER

Physics

Paper III – PHYSICS OF SEMICONDUCTOR DEVICES

Time : Three hours

Maximum : 75 marks

(No additional sheet will be supplied)

PART A — (5 × 3 = 15 marks)

Answer any FIVE questions.

Each question carries 3 marks

Each Answer should not exceed 1 page

1. Draw the band diagrams in reverse biasing and forward biasing of p-n junction.
2. Write the distinction between Zener break down and Avalanche breakdown.
3. Write the function of Schottky barrier diode.
4. Discuss tunnel diode I-V characteristics.
5. Write the principle and operation of Bipolar junction transistor in brief.
6. Write a note on basic mechanism of charge coupled devices.
7. Explain the formation of p-n junction by solid state diffusion method.
8. Write the principle and operation of light emitting diode.

PART B — (4 × 15 = 60 marks)

Answer ALL questions

Each question carries 15 marks.

Each answer should not exceed 6 pages.

9. (a) Obtain the expression for P-n junction capacitance.

(b) Discuss static I-V characteristics of real diode.

Or

10. (a) Write the applications of break down diodes.

(b) Write a note on Ohmic and Schottky contacts.

11. Write in detail the operation of Varactor and IMPATT diodes.

Or

12. Write the operation and Working of p-i-n and Gunn diode. Where these diodes find applications.

13. Write the principle and operation of JFET. Discuss in detail static I-V characteristics.

Or

14. Explain the inversion layer formation in MOSFET. Draw the energy band diagrams of MOS capacitor and explain.

15. Write a note on masking, lithograpy and Patterning of Semiconductor devices.

Or

16. Write the principle and operation of solar cell . How the photo diode can be used as a detector explain.

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