

(041130302)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2017.

THIRD SEMESTER

Branch — Physics

Paper III — PHYSICS OF SEMI - CONDUCTOR DEVICES

Time : 3 Hours

Max. Marks : 70

PART - A

Answer any FIVE of the following questions.

All question carry 4 marks.

(Marks : 5×4 marks = 20 marks)

1. Explain the static I - V characteristics of p-n junction diode.
2. Mention some special thyristors structures.
3. Write a note on Varactor diode.
4. Write a note on Photodiode.
5. Write the DC parameters of BJT.
6. Draw the C - V Characteristics of MOS capacitor.
7. Briefly explain Field - controlled thyristor.
8. Write a short note on Planar technology.

PART - B

Answer FOUR of the following. Each question carries 12.5 marks.

(Marks : 4×12.5 marks = 50 marks)

UNIT - I

9. (a) Calculate the built-in voltage, electric field and potential distribution in p-n junction Diodes.
(b) Derive the expression for Depletion layer capacitance.

Or

10. (a) Write a note on real diodes.
(b) Explain metal-Semiconductor interfaces.

UNIT - II

11. (a) Explain the tunnel diode and its I - V characteristics.
(b) Mention some applications of microwave devices.

Or

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12. (a) Distinguish between IMPATT and TRAPATT diode.
(b) Write a note on Semiconductor lasers.

UNIT - III

13. Explain the principle of operation and static I-V characteristics of an idealized mode JFET with a neat circuit.

Or

14. (a) Write the structure and operating principle of MOSFET.
(b) Give a note on Charge Coupled devices.

UNIT - IV

15. (a) Explain the working of power rectifiers.
(b) Discuss the properties of thyristors.

Or

16. (a) Describe the wafer preparation methods.
(b) Explain metal deposition techniques.
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