

Register Number :

Name of the Candidate :

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B.Sc. DEGREE EXAMINATION, 2008

(ELECTRONIC SCIENCE)

(SECOND YEAR)

(PART - III)

(GROUP -A-MAIN)

(PAPER - III)

**640. MATERIAL PHYSICS AND
SEMICONDUCTOR DEVICES**

(Including Lateral Entry)

December]

[Time : 3 Hours

Maximum : 100 Marks

PART - A (5 × 4 = 20)

Answer any FIVE questions

All questions carry equal marks.

1. Explain recombination and trapping process.
2. Discuss the properties of n - type and p - type semiconductors.

Turn over

B

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3. Write a note on thermistor and its application.
4. Sketch the input characteristics of a transistor operating in the CE modes and explain the nature of the curves.
5. Explain static characteristics of MOSFET.
6. Define the terms for FET:
 - (a) Shorted-gate drain current.
 - (b) Pinch-off voltage.and (c) Gate-source cut - off voltage.
7. Write short notes on photo - transistor.
8. Plot the characteristic curve of tunnel diode and also explain it.

PART - B (5 × 16 = 80)

Answer any FIVE questions

All questions carry equal marks.

9. (a) Explain the band formation in metals, semiconductors and insulators.

(b) Explain Hall effect and mobility.

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10. (a) Define the terms:
 - (i) Depletion region.
 - (ii) Barrier potential.
 - (iii) Break-down voltage.(b) What are Vanderwaal's forces ?
11. Discuss the V – I characteristics and its nature of a junction diode.
12. Explain the input and output characteristics of CB configuration.
13. Describe the classification and fabrication of JFET.
14. Explain common – drain FET amplifier with a neat diagram.
15. Explain the construction and working of SCR.
16. Explain the construction and working and application of a Laser diode.