

328755(28)

**B. E. (Seventh Semester) Examination,
April-May 2020**

(Old Scheme)

(EEE, Et & T Engg. Branch)

ADVANCED SOLID STATE DEVICES

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) of each question is compulsory and carries 2 marks and attempt two parts from (b), (c) and (d) and carry 7 marks each.

Unit-I

1. (a) What is semiconductors. 2
(b) Explain band gaps & lattice constants with diagram. 7

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PTO

- (c) Write short notes on : 7
(i) Velocity overshoot
(ii) Electron mobility
(iii) Critical thickness.
(d) What is band gap discontinuity and band gap narrowing explain briefly. 7

Unit-II

2. (a) What is HBTs. 2
(b) Explain the operation of High Electron Mobility transistors with neat diagram. (HEMTs). 7
(c) What are the difference between single electron transistor & velocity modulated transistor. 7
(d) Write short notes on : 7
(i) Resonant Tunneling Diodes
(ii) Heterostructure FET. (HFETs)

Unit-III

3. (a) What is Schottky barrier. 2
(b) Describe the NMOS fabrication process with suitable diagram. 7

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- (c) Explain the operation of CMOS with its VTC. 7
- (d) Draw and explain small signal parameters and equivalent circuit of MOSFET. 7

Unit-IV

- 4. (a) What is Lasers. 2
- (b) Explain Absorption Losses mechanism associated with optical fiber. 7
- (c) What are different types of Lasers? Explain their briefly. 7
- (d) Explain the operation of PIN photo diode with neat diagram. 7

Unit-V

- 5. (a) What is the use of switched capacitor filters. 2
- (b) Compare different types of OTA. 7
- (c) Explain the operation of LMF100 switched capacitor filter. 7
- (d) Explain briefly the operation of the operational trans-conductance Amplifier (OTA). 7