Roll No. | | | | | | | | | | | | |

Total No. of Pages : 01

Total No. of Questions : 08

M.Tech (ECE)(Wireless Communication) (Sem.–3)

SEMICONDUCTOR MILLIMETER-WAVE DEVICES

Subject Code : ECE-305

M.Code : 74639

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT question.
2. Each question carries TWELVE marks.

Q1. a) Define Fermi level. How is the Fermi distribution function used to calculate the electron and hole concentration in semiconductor? 06

b) Explain the significance of two valley model in Gunn diode. 06

Q2. Explain the construction and operation of microwave PIN diodes in detail 12

Q3. a) Explain high frequency equivalent circuit in detail. 06

b) Discuss Short-Channel effects in detail. 06

Q4. Describe two valley model of compound semiconductors in detail. 12

Q5. a) Compare the V-I characteristics of p-n junction diode and IMPATT diode. 06

b) What is Schottky barrier? Also explain its applications. 06

Q6. a) Discuss in detail the importance of small signal analysis of IMPATT diodes. 06

b) Explain the high frequency limitations of BJT in detail. 06

Q7. Discuss in detail the design considerations for Millimeter wave amplifiers and oscillators. 12

Q8. a) Write a brief note on the importance of heterojunction bipolar transistors. 06

b) List micro machining techniques for fabrication of micro switches, capacitors and inductors. Also discuss them in detail. 06

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.