Code: ECMC2T1

I M.Tech-II Semester-Regular Examinations-August 2014

SOLID STATE MICROWAVE DEVICES & CIRCUITS
(MICROWAVE & COMMUNICATION ENGINEERING)

Duration: 3 hours   Marks: 5x14=70

Answer any FIVE questions.   All questions carry equal marks

1 a) Explain the principal of extended interaction between electron beam and signal to be amplified using a TWT. Explain the construction, working of TWT also derive the expression for gain.   8 M

   b) Draw the circuit diagram of Two Cavity Klystron and explain its principal of operation.   3 M

   c) What is the bunching effect?   3 M

2 a) What is the phenomenon that gives rise to the negative charge accumulation at the metal side of the Schottky junction.   6 M

   b) Explain the working of PIN diode and draw its equivalent circuit.   8 M

3 a) Explain principle of operation of TRAPATT with neat
      sketch.   6 M

   b) Derive the IMPATT diode impedance, power conversion
      and efficiency.   8 M

4 a) Discuss the differences between avalanche transit time
      devices and transferred electron devices.   5 M

   b) Give the RWH theory.   6 M

   c) What are the disadvantages of application of solid state
      devices in microwave?   3 M

5 a) Draw the schematic of a GaAs MESFET and explain
      principle of operation.   8 M

   b) Draw the V-I characteristics of JFET.   3 M

   c) What are the applications of JFET.   3 M

6 a) Explain principle of operation and V-I characteristics of
      HBT's with circuit diagram.   7 M

   b) Explain power frequency limitation of silicon bipolar
      transistor.   7 M

7 a) Distinguish between MESFET and MOSFET.   4 M

  b) Explain about non-linear behavior of amplifier.   5 M

  c) Write bout Optimum noise match with reference to
     amplifier characterization.   5 M

8 a) Explain the significance of negative resistance in
     oscillators.   5 M

  b) What is the concept of negative resistance?   4 M

  c) Explain three-port S-parameter characterization of
     transistors.   5 M