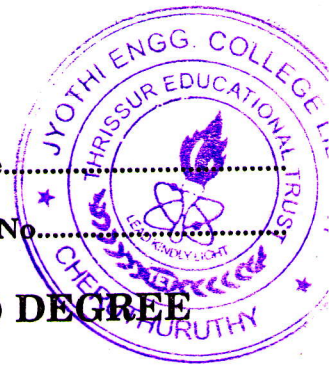D 51302

# SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2008

## EC 2K 702 – MICROWAVE DEVICES AND COMMUNICATION

Time : Three Hours          Maximum : 100 Marks

I. (a) What are reentrant cavities? Explain. Give Examples. Draw the sketches of all the cavities.

   (b) Write the S matric of 2 hole 4 port directional coupler. Explain its characteristics.

   (c) State and derive Floquets theorem for slow wave structures.

   (d) What are the types of Magnetrons? Explain them.

   (e) State and explain GUNN effect. Explain the features of LSA diode.

   (f) What are the domains of GUNN diode? Explain them.

   (g) Define polarization. Explain its types.

   (h) What are transponders? What is their need? Explain.

   (8 × 5 = 40 marks)

II. (a) (i) Derive standard wave equations.

   (ii) Explain in detail about the principle of wavemeters with a neat sketch.

   *Or*

   (b) (i) Differentiate Isolator from circulator.

   (ii) Derive the S matrix of an Ideal, lossless, matched hybrid junction.

III. (a) (i) Differentiate Linear beam tubes from M-type tubes.

   (ii) Derive an expression for velocity modulation of 2 cavity Klyston amplifier.

   *Or*

   (b) (i) Explain the amplification process of HTWT with a neat sketch.

   (ii) Derive the circuit equation of HTWT.

IV. (a) (i) Describe in detail the high frequency applications of Microwave transistors.

   (ii) Explain the RWH theory of GUNN diode.

   *Or*

   (b) (i) Differentiate IMPATT Diode from TRAPATT Diode.

   (ii) Explain in detail the principle of operation of BAR ITT Diode. With a neat sketch.

V. (a) (i) Describe in detail about the choice of frequency fore terrestrial microwave communication system.

   (ii) Obtain an expression for LOS optical distance in terms of heights of transmitting and receiving antennas.

   *Or*

   (b) Write technical notes on : (i) Digital link design ; (ii) Space Division Multiple Access.

   [4 × 15 = 60 marks]