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Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2005

EC 2K 702—MICROWAVE DEVICES AND COMMUNICATION

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

I. (a) Explain how a rectangular waveguide can act as a filter.

(b) What is an Isolator ? Explain. What are its types ? Write the S matrix for Ideal Isolator.

(c) What is tuning in multi cavity Klystron amplifiers ? Explain.

(d) What is gain parameter in HTWT ? Explain its significance.

(e) Differentiate μwave BJT from μwave FET.

(f) State the advantages and applications of TRAPATT diode.

(g) What are the types of Microwave links ? Explain.

(h) What is a multiple spot beam antenna ? Write its features.

(8 × 5 = 40 marks)

II. (a) (i) Explain in detail the principles of rectangular cavity resonators. (7 marks)

(ii) Derive the TM mode field equations of rectangular waveguides. (8 marks)

Or

(b) Explain the characteristics of Magic Toe ; with a neat sketch. Derive the scattering matrix for an Ideal one.

III. (a) Explain in detail the amplification process of HTWT with a neat sketch. Derive an expression for convection current.

Or

(b) Explain the principles of Linear magnetron with a neat sketch. Derive Hull cut off conditional equations and Hartree conditions for linear magnetron.

IV. (a) (i) Explain the advantages of semiconductor microwave devices. (7 marks)

(ii) Explain the principle of operation of Tunnel diode with its energy band diagrams. (8 marks)

Or

(b) Explain in detail the operating mechanism of TRAPATT and BARITT diodes with neat sketches.

Turn over

V. (a) (i) Define and explain :

1 Optical LOS.

2 Skip zone.

3 Fading.

4 Diversity Reception. (8 marks)

(ii) Discuss the effect of polarization in satellite communication. (7 marks)

Or

(b) Describe in detail the features and applications of Digital satellite links.

[4 × 15 = 60 marks]