

D 11241



Name.....

Reg. No.....

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

**EC 2K 702—MICROWAVE DEVICES AND COMMUNICATION**

Time : Three Hours

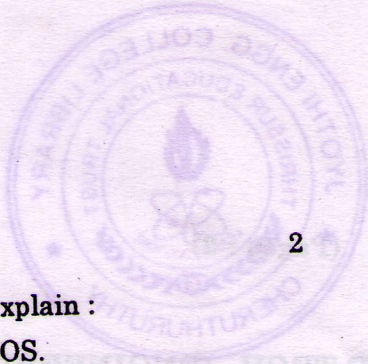
Maximum : 100 Marks

*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  $\mu$ wave BJT from  $\mu$ wave 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  $\times$  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 Tee ; 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. (7 marks)
- 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]