

**D 26530**

Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE  
EXAMINATION, DECEMBER 2006**

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

Time : Three Hours

Maximum : 100 Marks

*Answer all questions.*

1. (a) Draw a neat sketch of E-plane Tee. Explain its characteristics. Derive its S-matrix.  
(b) Explain the characteristics of circular cavity resonators.  
(c) What type of tuning is employed in multicavity Klystron amplifier ? Why ? Explain.  
(d) List and explain the types of magnetrons.  
(e) State and explain Gunn effect. Also explain the high-field domain formation.  
(f) Differentiate Tunnel diode from Zener diode.  
(g) Explain the basic principles of microwave links with a neat sketch.  
(h) What is a transponder ? Explain its principle in detail.  

(8 × 5 = 40 marks)
2. (a) Draw a neat sketch of reflex Klystron oscillator and explain its principle of operation. Describe its velocity and current modulations. Derive equations.  

*Or*

(b) Draw a neat cross-sectional diagram of circular magnetron. Explain its principle of oscillation and formation of “spokes”.
3. (a) Explain the principle of 2 hole directional coupler, with a neat sketch. Explain its types. Derive S-matrix for an ideal 2 hole directional coupler.  

*Or*

(b) Derive TE and TM field equations of rectangular waveguide.
4. (a) State and explain Gunn effect. Explain its construction and fabrication in detail. Derive the condition for its negative resistance.  

*Or*

(b) Explain the principles of following diodes :—  
(i) Inp diode. (7 marks)  
(ii) BARITT diode. (8 marks)
5. (a) Explain the functioning of microwave transmitter and receiver with neat block diagrams.  

*Or*

(b) (i) Derive an expression for pathless. (7 marks)  
(ii) Give a note on “Digital Modulation Schemes”. (8 marks)

[4 × 15 = 60 marks]