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Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, DECEMBER 2007**

EC 04 702—MICROWAVE DEVICES AND COMMUNICATION

(2004 admissions)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

1. (a) What are cavity resonators ? Explain the dominant modes of them.
(b) Explain the characteristics of Hybrid junction.
(c) What type of tuning is employed in multicavity Klystron amplifiers ? Explain. Why ?
(d) Explain the types of slow wave structure for TWT with neat sketches.
(e) Differentiate tunnel diode from PN junction diodes.
(f) Explain the three cavity model of LSA diode with neat sketches.
(g) Define 'LOS' distance. Derive an expression for optical LOS distance.
(h) Give an account on Antennas for satellite communication systems.

(8 × 5 = 40 marks)

2. (a) Derive TE mode and TM mode field equations of circular waveguide. Differentiate circular waveguide from rectangular waveguide.

(15 marks)

Or

- (b) Explain the principle of following and derive S matrix for them under matched conditions :
 - (i) Directional coupler.
 - (ii) Isolator.

(7 + 8 = 15 marks)

3. (a) Derive an expression for exit velocity of Reflex Klystron oscillator. Explain the mode characteristics of Reflex Klystron.

Or

- (b) Derive Hartree and Hull Wtloff conditional equations of Linear magnetron.
4. (a) Explain the various modes of oscillation of GUNN diode. Derive the condition for negative resistance of GUNN diode.

Or

- (b) Explain the operating principles of :
 - (i) IMPATT diode.
 - (ii) INP diode.

(7 marks)

(8 marks)

Turn over

5. (a) (i) Derive Friis transmission formula to calculate pathloss.
(ii) Explain various digital modulation schemes.

(7 marks)

(8 marks)

Or

- (b) Write technical notes on :

(i) Satellite construction.

(7 marks)

(ii) Basic principles of microwave links.

(8 marks)

(4 × 15 = 60 marks)