MBQ-003-0271005 Seat No. _____

M. Sc. (ECI) (Sem. X) (CBCS) Examination

April / May - 2018

Microwave Electronics : Paper - 40

(New Course)

Faculty Code : 003
Subject Code : 0271005

Time : Hours] [Total Marks : **70**

Instructions : (1) All questions carry equal marks.
(2) Figures on right hand side indicate marks.

1 (a) State whether the following statements are true or false : **6**

(1) Overlay and mesh geometries are used for power transistor.

(2) (FETs) at microwaves freqs. are mostly fabricated in GeSi and used a metal-semiconductor Schottky junction for the gate contact.

(3) GaAs exhibit a negative differential mobility that is a decrease in the carrier velocity with increase in electric field.

(4) TE_{10} mode has the longest operating wavelength and designated as the dominant mode in circular waveguide.

(5) The wave of lowest frequency or the dominant mode in the circular wave-guide is the TE_{11} mode.

(6) All cavities of a klystron amplifier tube are tuned to the same frequency; this method of tuning is called Synchronous tuning.

(b) Answer the following : **8**

(1) Which three power sources are used in reflex klystron ?

(2) Which three cavities are used in multi cavity klystron ?

(3) Give the full forms of BARITT and TRAPPAT.

(4) Which three characteristics of ordinary vacuum tubes become increasingly important as frequency rises ?

2 Answer the following : (Any two)

(1) Explain the basics principles of microwave tubes and describe the limitation of conventional tubes. **7**

(2) Gives the characteristics features and applications of microwaves. **7**

(3) Describe the basic principles of velocity modulation. **7**

3 Answer the following :

(1) How two cavity klystron amplifier works ? **5**

(2) Explain the basic theory of operation of travelling wave tubes with electron beam and slow wave structure. **5**

(3) Write notes on reflex klystron oscillator. **4**

OR

3 Answer the following :

(1) Explain the geometries of microwave transistors. **5**

(2) Describe crossed electric and magnetic field in magnetron. **5**

(3) Draw and explain the physical structure of MESFET. **4**

4 Answer the following : (Any two)

(1) Describe the principles of operation of TRAPATT mode of diode. **7**

(2) Define the terms HMIC & MMIC. List the basic properties required for an ideal MIC materials. **7**

(3) Describe the reflection of microwave from a metal surface with illustration. **7**

5 Answer the following : (Any two)

(1) Explain gunn oscillator circuits. **7**

(2) Discuss the two valley model theory of TEDs. **7**

(3) Draw and discuss the wave guide tee and magic tee. **7**

(4) Discuss the dielectric properties of material determine at microwave frequencies by dielectric measurement. **7**
