DII-003-015403 Seat No. _____

M. Sc. (Electronics) (Sem. IV) (CBCS) Examination

May / June – 2015

Microwave Electronics : Paper - 15

(New Course)

Faculty Code : 003

Subject Code : 015403

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

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

1 (a) Answer the following: (Any five) (10)

1. Gives the names of geometries of microwaves transistors.
2. Which three power sources are used in reflex klystron?
3. Gives the difference between TEDs and microwave transistor.
4. Which three cavities are used in multi cavity klystron?
5. Which three characteristics of ordinary vacuum tubes become increasingly important as frequency rises?
6. Why FET is referred as field effect transistor.
7. Give the full forms of IMPATT and HBT.

(b) Answer the following: (04)

1. TE_{10} mode has the longest operating wavelength and as the dominant mode in rectangular waveguide. (T/F)
2. (FET) at microwaves freqs. Are mostly fabricated in GeSi and used as a metal-semiconductor Schottky junction for gate contact. (T/F)
3. GaAs exhibit a negative differential mobility that is a decrease in the carrier velocity with increase in electric field.(T/F)
4. All cavities of a Klystron amplifier tube are tuned to the same frequency; this method of tuning is called synchronous tuning.(T/F)

2 Answer the following. (Any two)

1. Define the term microwaves. Gives its characteristics features and applications. (07)
2. Describe the basic principles of velocity modulation. (07)
3. Explain the basics principles of microwave tubes and describe the limitation of conventional tubes. (07)

3 Answer the following:

1. How two klystron amplifier works? (05)
2. Explain the basic theory of operation of travelling wave tubes with electron beam and slow wave structure. (05)
3. Write notes on Reflex klystron oscillator. (04)

OR

.3 Answer the following:

1. Describe crossed electric and magnetic field in magnetron. (05)
2. Draw and explain the physical structure of MESFET. (05)
3. Write notes on two-valley model theory of TEDs. (04)

.4 Answer the following: (Any two)

1. Describe the principles of operation of TRAPATT mode of diode. (07)
2. Define the terms HMIC & MMIC. List the basic properties required for an ideal MIC materials. (07)
3. Discuss the dominant mode TE_{10} in rectangular wave guide with illustration and also explain current distribution in it. (07)

5 Answer the following: (Any two)

1. Describe the reflection of microwave from a metal surface with illustration. (07)
2. Discuss the dielectric measurement with microwaves. (07)
3. Write notes on Gunn oscillator circuits. (07)
4. Explain PIN diode and discuss Pin diode works as shunt mounted switch and series mounted switch. (07)
