



BBD-003-1154007

Seat No. _____

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

July - 2021

Electronics

(Microwave Electronics)

(New Course)

Faculty Code : 003

Subject Code : 1154007

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) All question carry equal marks.
(2) Figures on right hand side indicate marks.
(3) Write any Five questions.

- 1 Answer the following: 14
- (1) Gives the names of geometries of microwaves transistors.
(2) The microwave solid-state devices can be broken down into
_____, _____, _____, _____
 - (3) A bipolar transistor can be operate in four different modes
_____, _____, _____, _____
 - (4) Which three characteristics of ordinary vacuum tubes become increasingly important as frequency rises?
 - (5) Define the term transferred electron effect.
 - (6) Give the full forms of BARITT and IMPATT.
 - (7) Why FET is referred as field effect transistor?
 - (8) Define the term pinch-off condition (in FET).

- 2** Answer the following: **14**
- (1) Which three power sources are used in reflex klystron?
 - (2) Which three cavities are used in multi cavity klystron?
 - (3) Which three characteristics of ordinary vacuum tubes become increasingly important as frequency rises?
 - (4) Give the definition of cavity resonator. Draw the shapes of coaxial and radial cavities.
 - (5) Define the term transit time in vacuum tubes.
 - (6) Why we are using multicavity power Klystron instead of two cavity Klystron?
 - (7) Define the term STAGGERED TUNING.
- 3** Answer the following:
- (1) Explain the basics principles of microwave tubes and describe the limitations of conventional tubes. **7**
 - (2) Give the characteristics features and applications of microwaves. **7**
- 4** Answer the following:
- (1) Explain the basic theory of operation of travelling wave tubes with electron beam and slow wave structure. **7**
 - (2) How two cavity klystron amplifier works? **7**
- 5** Answer the following:
- (1) Discuss two valley model theory. **7**
 - (2) Write short notes on Reflex klystron. **7**
- 6** Answer the following:
- (1) Describe crossed electric and magnetic field in magnetron. **7**
 - (2) Draw and explain the physical structure of MESFET. **7**

- 7 Answer the following:
- (1) Write notes on Backward wave oscillator. 7
 - (2) Describe the reflection of microwave from a metal surface with illustration. 7
- 8 Answer the following:
- (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
- 9 Answer the following:
- (1) Discuss the dominant mode TE₁₀ in rectangular wave guide with illustration and also explain current distribution in it. 7
 - (2) Explain PIN diode and discuss PIN diode works as shunt mounted switch and series mounted switch. 7
- 10 Answer the following:
- (1) Write notes on magic tees. 7
 - (2) Discuss the dielectric properties of material determine at microwave frequencies by dielectric measurement. 7
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