



B.Tech VII Semester Regular/Supplementary Examinations, November 2022

MICROWAVE ENGINEERING
(Electronics and Communication Engineering)

Maximum Marks: 70

Date: 01.12.2022 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 What are the applications of Microwaves
- 2 Discuss how the microwave spectrum is categorized into different bands.
- 3 What is post? What are the applications?
- 4 Compare probe and loop connectors
- 5 What are the limitations of conventional tubes at microwave frequencies?
- 6 What are the advantages of slow wave structures?
- 7 What is meant by π mode in Magnetron?
- 8 What are the applications of Gunn diode?
- 9 Why Isolator is used in microwave measurements?
- 10 Why Z and Y parameters are not measured at microwave frequencies?

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Derive the expressions for the field components due to TM waves in rectangular wave guide. 10M
- OR
- 12 A. Why TEM wave propagation is not possible in rectangular wave guide 5M
B. Explain the wave impedance of a rectangular waveguide and derive the expression for the wave impedance of TE and TM modes. 5M
 - 13 A. What are the different types of waveguide attenuators? Explain their working with neat diagrams. 5M
B. Draw the structure of Ferrite isolator and explain its working 5M
- OR
- 14 A. Draw the structure of Magic Tee and write its characteristics. 5M
B. Explain how Gyrator gives phase shift and explain it with neat diagram. 5M
 - 15 How the oscillations are generated in reflex klystron and explain bunching process with apple gate diagram and also derive the equation for efficiency. 10M

OR

- 16 What are the different modes of operation of TWT and explain them 10M
- 17 What is meant by transferred electron devices? Explain the principle of operation of GUNN diode and draw its characteristics. 10M
- OR
- 18 How cross-field is used to generate oscillations in Magnetron and derive the Hull cut-off condition? 10M
- 19 How to find Low and high VSWR of a given load at microwave frequencies? Explain. 10M
- OR
- 20 Derive the S matrix of directional coupler and define all the parameters. 10M