

R09

Code No: 09A70402

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, May/June - 2013

Microwave Engineering

(Electronics and Communication Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any Five Questions

All Questions Carry Equal Marks

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- 1.a) What is a Microwave spectrum bands? Explain briefly the Applications of Microwave waves at various frequency bands.
- b) Explain the TE and TM modes of propagation in waveguides. Why TEM wave does not exist in rectangular wave guide. [5+10]
- 2.a) What are the advantages of Dominant mode of propagation in Rectangular wave guides.
- b) Derive field equation for dominant TE mode of propagation in Rectangular waveguide . [5+10]
- 3.a) Explain the applications of Directional Couplers and Obtain scattering matrix.
- b) Explain the properties of E and H-Plane Tee with neat diagram. [7+8]
- 4.a) What is the application of Circulator ? Derive S Matrix Calculations for Circulator with neat diagram.
- b) What are different compositions and characteristics of Ferrite components? [10+5]
- 5.a) What is Reflex klystron. Explain its operation with a neat diagram.
- b) What are the limitations of conventional vacuum tubes to operate at microwave frequencies. [8+7]
- 6.a) What is Gunn effect. Explain the operation of Gunn diode.
- b) Explain the principle of working for Two - Cavity Klystron with Velocity diagram. [8+7]
- 7.a) What is need of Helix in TWT? Describe the Amplification process for TWT.
- b) What are Microwave Solid State Devices? Explain Operation and Applications of TED's with neat diagram [8+7]
8. Explain the following with neat diagram
  - a) Measurement of Microwave power
  - b) Measurement of VSWR. [15]

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