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Question Paper Code: 47403

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Seventh Semester

Electronics and Communication Engineering

14UEC703 - MICROWAVE ENGINEERING

(Regulation 2014)

Duration: One hour   Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. To couple two waveguides a choke flange may be used

    (a) As it is simpler than any other method of joining

    (b) To help the alignment of the waveguides

    (c) To compensate for discontinuities at the joint

    (d) T increase the bandwidth of the system

2. The waveguide tuning component, which is not easily adjustable is,

    (a) Screw   (b) Iris   (c) Stub   (d) Plunger

3. TRAPATT diode is preferred over IMPATT diode because of

    (a) High η   (b) Less sensitivity to harmonics

    (c) Lower noise   (d) Ability to operate at higher frequencies

4. Two entities that are combined to form a Magic Tee are

    (a) One H and one E plane tee   (b) One Hand two E plane tees

    (c) Two Hand two plane tees   (d) Two H and one E plane tee

5. The efficiency (η) of the klystron can be calculated as

    (a) $\eta = P_{ac} + P_{dc}$ (b) $\eta = P_{ac} + P_{dc}$ (c) $\eta = P_{ac} - P_{dc}$ (d) $\eta = P_{ac} / P_{dc}$

6. The microwave tube amplifier that uses an axial magnetic field and radial electric field is
   - (a) Reflex klystron
   - (b) CFA
   - (c) Coaxial magnetron
   - (d) Travelling wave magnetron

7. The fabrication of microstrip line is done by
   - (a) Photo etching
   - (b) Printed circuit technique
   - (c) Oxidation
   - (d) Cladding

8. Processing in MMICs is done by
   - (a) Ion implantation
   - (b) Net list generation
   - (c) Floor planning
   - (d) None of the above

9. A loss less line of characteristics impedance Z_0 is terminated in pure reactance of $-jZ_0$ value. VSWR is
   - (a) 10
   - (b) 2
   - (c) Infinity
   - (d) 1

10. The reflection coefficient on a line is $0.2\angle 45^0$. The SWR is
    - (a) 0.8
    - (b) 1.1
    - (c) 1.2
    - (d) 1.5

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. The S-parameters of a two-port network are given by

    $S_{11} = 0.2\angle 90°$ $S_{22} = 0.2 \angle 90°$
    $S_{12} = 0.5 \angle 90°$ $S_{21} = 0.5 \angle 0°$

    (i) Determine whether the network is lossy or not.

    (ii) Is the network symmetrical and reciprocal? Find the insertion loss of network. (8)

12. Explain the operating principle of a Gunn diode. Describe its domain formation and various modes of operations. (8)

13. Explain the π mode of Oscillations in a Magnetron and derive the Hull cut-off equations of a Magnetron. (8)

14. Explain the various stages involved in Monolithic Microwave Integrated Circuits technology. (8)

15. Explain the impedance measurement technique using slotted line and reflectometer. (8)

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