

6E3085

Roll No. \_\_\_\_\_

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**6E3085**

**B. Tech. VI-Sem. (Old Back) Exam., April/May-2016**  
**Electronics & Communication Engineering**  
**6EC1 (O) Microwave Engineering – II**

**Time: 3 Hours**

**Maximum Marks: 80**

**Min. Passing Marks (Old Back): 24**

**Instructions to Candidates:-**

*Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly.*

*Units of quantities used/ calculated must be stated clearly.*

*Use of following supporting material is permitted during examination. (Mentioned in form No. 205)*

1. NIL \_\_\_\_\_

2. NIL \_\_\_\_\_

**UNIT-I**

- Q.1 (a) What is double minimum method of VSWR measurement? Explain it for VSWR measurement. [8]
- (b) Explain one method of Power Measurement at microwave frequencies. Also compare the Power Measurement Methods according to power level. [8]

**OR**

- Q.1 (a) Calculate the VSWR of a transmission system operating at 200 GHz. TE<sub>10</sub> Mode is propagating through the waveguide of dimension (6.4 × 3.2) cm<sup>2</sup>. The distance between two successive minima is 1.6mm. [8]

- (b) What is Scattering Parameter? Write the general value of S – parameter for a 3 – port network (with two port matched). Also discuss the method of S – parameter measurement. [8]

## UNIT-II

- Q.2 (a) Draw the field lines in following - [4×3=12]
- (i) Parallel strip line
  - (ii) Shielded strip line
  - (iii) Micro strip line.
- (b) Discuss the dominant and higher order modes in strip line structure. [4]

### OR

- Q.2 (a) Write the selection criteria of dielectric constant of the substrate in planar transmission line. Also write the name of different substrates used in microwave planar transmission lines, and compare their dielectric constants and loss tangent. [12]
- (b) What is non radiative guide? What is condition of non radiation? Write the example of such guide used. [4]

## UNIT-III

- Q.3 (a) A two port network has S – parameter

$$[S] = \begin{bmatrix} 0.1 \angle 0^\circ & 0.5 \angle 90^\circ \\ 0.2 \angle 90^\circ & 0.5 \angle 0^\circ \end{bmatrix}$$

Determine whether the network is loss less. If the output port is open circuit then find the return loss. [10]

- (b) Write the conversion expression of ABCD Parameter in S – parameter. [6]

**OR**

Q.3 (a) What is signal flow graph? Draw the signal flow graph for a network whose Z – parameter are - [8]

$$Z_{11} = 0.05 \quad Z_{12} = 1.5$$

$$Z_{21} = 1.5 \quad \text{and} \quad Z_{22} = 1.0$$

(b) State and find the reciprocal condition in terms of S – Parameter for a two port network. [8]

**UNIT-IV**

Q.4 Draw the construction and explain the operation of - [8×2=16]

(a) IMPATT

(b) TRAPTT

**OR**

Q.4 (a) Draw the construction of a Gunn diode and discuss its different modes of operation. [8]

(b) What is difference between MASER and LASER? Explain the working of a semi conductor LASER. [8]

**UNIT-V**

Q.5 Discuss the Method of (any two) - [8+8=16]

(a) Thin film formation

(b) Inductor realization in MIC<sub>S</sub>

(c) Different materials used in MMIC

(d) Difficulties of MIC<sub>S</sub>.