

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2021****Subject Code:3171001****Date:15/12/2021****Subject Name: Microwave Theory and Techniques****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Write the applications of microwave. **03**
 (b) Discuss the merit and demerits of microwave signals. **04**
 (c) Explain the smith chart in detail. **07**
- Q.2** (a) Define: (i) VSWR (ii) Characteristics Impedance (iii) Return Loss. **03**
 (b) Explain the losses associated with microwave transmission. **04**
 (c) Explain in detail working of IMPATT diode. **07**
- OR**
- (c) Derive transmission line equations and also derive solution of transmission line equation. **07**
- Q.3** (a) Discuss the characteristics of TEM, TE and TM Mode. **03**
 (b) Write short note on Circular waveguide. **04**
 (c) Discuss reflex klystron with suitable diagrams. **07**
- OR**
- Q.3** (a) Explain in brief microwave oscillator design. **03**
 (b) What is S- parameter? Discuss the Properties of S- parameter. **04**
 (c) Draw the micro strip lines and parallel strip lines. Also derive their characteristic impedance equation. **07**
- Q.4** (a) List the performance parameters of directional couplers. **03**
 (b) Explain the working of PIN diodes and its applications. **04**
 (c) Explain briefly different method of Impedance measurement at microwave frequency. **07**
- OR**
- Q.4** (a) Discuss in brief different type of microwave attenuators. **03**
 (b) Explain Magic Tee with its applications. **04**
 (c) Explain RF and microwave amplifier design. **07**
- Q.5** (a) Discuss the effects of microwave on human body. **03**
 (b) Write short note on Microwave Antenna. **04**
 (c) Explain Basic Principal of “RADAR” draw and explain the block diagram of RADAR. **07**
- OR**
- Q.5** (a) Explain in brief EMI and EMC issue. **03**
 (b) Discuss RF MEMS for microwave components. **04**
 (c) Explain Network Analyzer and how different scattering parameters are measured? **07**
