

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (Old) EXAMINATION – WINTER 2019****Subject Code: 171001****Date: 05/12/2019****Subject Name: Microwave Engineering****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.

- Q.1** (a) Discuss the advantages of microwave frequencies compare with low-frequency waves and list out the various applications of microwaves. **07**
- (b) Draw and explain equivalent circuit of a length Δx of a transmission line at microwave frequencies. **07**
- Q.2** (a) Describe the “Reflex Klystron” with the aid of suitable schematic diagram. Why the Transit Time is so important in this device. **07**
- (b) Write the advantages and disadvantages of rectangular waveguide over circular wave guide .List out the differences between the TE mode and TM mode. **07**
- OR**
- (b) A transmission line has a characteristic impedance of $50 + j 0.01 \Omega$ and is terminated in a load impedance of $73 - j 42.5 \Omega$. Calculate: (a) the reflection coefficient; (b) the standing-wave ratio. **07**
- Q.3** (a) What do you mean by stub? Explain impedance matching by use of stub with necessary circuit, waveforms and derivation. **07**
- (b) With neat sketch, explain the operation of Magnetron. **07**
- OR**
- Q.3** (a) What is magic associated with a Magic Tee ?Draw a neat sketch of a Magic Tee and list out its applications and properties **07**
- (b) Explain construction, characteristic and application of Gunn diode. **07**
- Q.4** (a) Write a note on Directional coupler and its applications. Explain the terms Coupling factor and Directivity. **07**
- (b) What is Tunneling effect? Explain the construction and working of Tunnel diode. What are the applications of Tunnel diode? **07**
- OR**
- Q.4** (a) Explain the construction and working of IMPATT diode. What are its applications? **07**
- (b) With neat sketch, explain the operation of “Traveling Wave Tube”. **07**
- Q.5** (a) What do you mean by Doppler effect? Explain operation of MTI radar. **07**
- (b) Explain Basic Principal of “RADAR” and Derive the basic RADAR Range Equations **07**
- OR**
- Q.5** (a) Describe Microstrip line in detail. **07**
- (b) Explain “Faraday Rotation Circulator” and “Y Circulator” with neat sketch **07**
