

III B. Tech II Semester Supplementary Examinations, April - 2021

MICROWAVE ENGINEERING

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **FOUR** Questions from **Part-B**

PART -A**(14 Marks)**

1. a) Define degenerate mode in a waveguide. [2M]
- b) What are the applications of circular waveguide? [2M]
- c) Write the performance characteristics of two cavity klystron amplifier. [3M]
- d) Write the performance characteristics of Magnetron. [2M]
- e) What is Faraday rotation? [3M]
- f) What are the differences between microwave transistors and TEDs? [2M]

PART -B**(56 Marks)**

2. a) Discuss about impossibility of TEM mode in waveguides. [7M]
- b) What is meant TM mode in waveguide? Write the expression for cutoff wave number, cutoff frequency, phase constant, phase velocity and characteristic impedance for TM mode rectangular waveguide. [7M]
3. a) What is meant by cavity resonator? Discuss about rectangular cavity resonator. [7M]
- b) Discuss about quality factor of a microstrip line. [7M]
4. a) Explain the bunching process in two-cavity klystron amplifier. [7M]
- b) Draw the applegate diagram of reflex klystron and explain it. [7M]
5. a) Explain the nature of four propagation constants in helix travelling wave tube. [7M]
- b) Derive the Hull cutoff voltage equation of a cylindrical magnetron. [7M]
6. a) What is H-Plane Tee? Derive the S-matrix of an H-plane Tee. [7M]
- b) Explain about Rotary vane type waveguide phase shifter. [7M]
7. a) Explain the working principle of IMPATT diode. [7M]
- b) Explain the procedure of attenuation measurement using RF substitution method. [7M]

