SEMESTER - III

Paper - II : **Microwave Devices**

Max. Marks: 55
Time: 3 Hrs.

Note: Nine questions will be set and students will attempt 5 questions. Question No. 1 will be compulsory consisting of 4 parts based on the conceptual aspects of the whole syllabus. The answers should not be in yes/no. In addition to Question No. 1 there will be four Units in the question-paper each containing two questions belonging to four Units in the syllabus. Students will select one question from each unit.

UNIT - I

Wave equation and boundary conditions, Plane monochromatic wave in non-conducting media, Reflection and refraction at the boundary of two non-conducting media, oblique Incidence, reflection from a conducting plane, total internal reflection propagation between parallel conducting plane.

UNIT - II

Wave-guides, Rectangular and Coaxial wave guides, Resonant cavities, Q of a cavity resonator. Transmission lines: Transmission lines equation and solutions, Quarter and Half wavelength lines, Impedence matching using smithchart.

UNIT - III

Klystron-operation, velocity modulation, bunching, output power, beam loading, Reflex Kylstron-operation velocity modulation, power output. Travelling wave tube, backward wave amplifier and oscillator. Microwave switching devices - Krytron.

UNIT - IV

Transferred Electron devices, Gunn Effect diode-operation, Modes of operation. Microwave generation, amplification, LSA, InP and CdTe diodes Avalanche Transit time Devices, (ATD) READ diode, IMPATT diode, TRAPATT diode, BARITT diode. Detector diodes and mounts, measurements of wavelengths, frequency, impedence, power scattering

parameters, Theory and property of scattering parameters, directional couplers, Faraday rotation in ferrites.

Reference

1. Foundations of Electromagnetic theory - J.R. Reitz and Milford, Addition Wesley.

2. Microwave Devices and Circuits - Samuel Y. Liao. PHI Pvt. Ltd.

3. Electronic Communication - Roody and Coolen.

4. Electronic Communication - George Kennedy