02/06/2025 BE EXTC SEM-VII C-SCHEME MICROWAVE ENGG. QP CODE: 10083719

Time: 3 Hours **Marks: 80**

Note:

1. Question No.1 is compulsory.
2. Attempt any three from the remaining questions.
3. Assume suitable data if applicable.
4. Figures on the right hand side indicate full marks.

Q1: Solve any four

a) Explain working principal of PIN diode 5

b) Describe characteristics of E plane tee 5

c) Compare Stripline and Microstrip line 5

d) List the microwave frequency bands with frequency range and applications 5

e) Explain pi mode oscillations in Magnetron 5

Q2: A) Design a single stub matching network using short circuited shunt stub to **10**

Match the terminating load $Z_L = (200 + j300)\ \Omega$ to the characteristics impedance

$Zo = 300\Omega$.

B) A rectangular waveguide is filled by dielectric material of $\epsilon r = 9$ and has inside **10**

Dimensions of 7x3.5 cm. It operates in dominant TE_{10} mode.

i) Determine the cut-off frequency

ii) Find the phase velocity in the guide at a frequency of 2 GHz

iii) Find the guided wavelength at the same frequency

Q3: A) Explain characteristics of Magic Tee **10**

B) List various modes of oscillation of Gunn diode. Explain working of any One mode. **10**

Q4: A) What are ferrite devices? Explain any two in detail. **10**

B) Explain method to measure low and high VSWR at microwave frequency. **10**

Q5: A) Derive the expression for input impedance for a lossless transmission line. **10**

B) Explain working of Reflex Klystron with appropriate schematic diagram and Applegate diagram with gap voltage. **10**

Q6: A) Derive the field equations for a wave propagation in TM mode inside A rectangular waveguide. **10**

B) Explain principal of operation of TRAPATT diode with the help of voltage and Current waveform. **10**

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