

Code No: 137EK

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, October/November - 2020

MICROWAVE ENGINEERING

(Electronics and Communication Engineering)

Time: 2 Hours

Max. Marks: 75

Answer any Five Questions

All Questions Carry Equal Marks

- 1.a) Adapt the solutions of wave equations in rectangular waveguide coordinates.
- b) Examine the losses in Micro strip lines. [8+7]
- 2.a) Evaluate Cut off wave length, guided wave length and free space wave length for the dominant mode of operation in an air filled rectangular waveguide with dimensions of 4×3 cms and operates 5GHz frequency.
- b) Analyze the Characteristic Impedance of Micro strip lines. [8+7]
- 3.a) Justify and explain about rectangular cavity resonator and calculate its resonant frequency.
- b) Discuss the operation and principle of Isolators and circulators. [8+7]
- 4.a) Discuss about directional coupler with neat diagram.
- b) Examine about waveguide phase shifters with neat diagrams. [7+8]
- 5.a) Compose and explain about two cavity Klystron amplifier and derive its Bunching process.
- b) Formulate Power Output and Efficiency in Reflex Klystron amplifier. [8+7]
- 6.a) Discuss the significance and types of Helix TWTs.
- b) Design the input voltage and electronic efficiency when the beam voltage $V_0 = 250$ v, beam current $I_0 = 10$ mA, and the signal voltage $V_{in} = 25$ v are the parameters of a reflex klystron which operates at the mode $n = 2$. [7+8]
- 7.a) Interview about PI- mode operation and separation, and write its characteristics.
- b) Discuss about the principle and operation of TEDs, and write its applications. [8+7]
- 8.a) Construct and explain about Magic Tee and calculate its S- parameters.
- b) Dissect the measurement of Power by using of Bolometer. [8+7]

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