

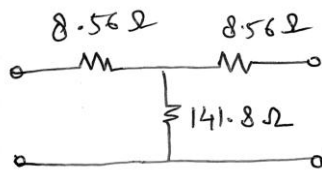
Time : 3 Hrs

Marks : 80

Note:

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

1. a) Design Circulator using Magic Tee. (05)  
 b) Explain Amplification Process in TWT. (05)  
 c) Compare Isolator and Gyrator. (05)  
 d) Calculate S parameters for 3dB Attenuator. Assume  $Z_0 = 50 \Omega$ . (05)



2. a) Explain the significance of RWH theory and explain two valley models in GUNN diode. (10)  
 b) What is the importance of beam coupling coefficient? Derive the expression for velocity modulation in two cavity klystron. (10)
3. a) Derive the expression for various parameters that describe the wave propagation in TE/TM mode in Rectangular Waveguide (10)  
 b) Explain Impedance measurement Technique in microwave. (10)
4. a) Design a two lumped element matching network at frequency 500 MHz frequency to match  $Z_L = 200 - j100$  ohms with a transmission line of  $Z_0 = 100$  ohms using Smith Chart. (10)  
 b) Draw and explain two-hole directional coupler and derive the S-parameter for the same. (10)
5. a) Design two single stub matching network (shunt- short) for a given load of  $60 - j80$  ohms to match with a 50 ohms transmission line using Smith Chart. (10)  
 b) Compare HMICs and MMICs with suitable diagram. (10)
6. Write short note on **any two** (20)
  - a) Magnetron
  - b) Transit time diodes
  - c) HEMT

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