

## (REVISED COURSE)

( 3 Hours)

[ Total Marks : 100

N.B.(1) Question No. 1 is compulsory.

(2) Attempt any four questions out of remaining six questions.

(3) Assume suitable data, is necessary.

1. Attempt in brief (any four) :— 20
  - (a) Microstrip and stripline transmission lines
  - (b) PIN diode
  - (c) Microwave Applications
  - (d) Attenuators
  - (e) Helix TWT.
  
2. (a) Explain the need of impedance matching required for microwave circuits. Explain various methods of impedance matching for microwave circuits. 12
- (b) Derive the expression for fields in TE modes of rectangular waveguide. 8
  
3. (a) Describe reflex Klystron and derive the relationship between output power and the repeller voltage. 12
- (b) A two cavity amplifier Klystron has the following characteristics. 8

Voltage gain	= 15 dB
Input power	= 5 mW
Total shunt impedance of input cavity $R_{sh}$	= 30 k $\Omega$
Total shunt impedance of output cavity $R_{sh}$	= 40 k $\Omega$
Load impedance of output cavity $R_L$	= 40 k $\Omega$

Determine :

(i) Input power (ii) Output voltage and (iii) Power delivered to load.
  
4. (a) Draw the schematic diagram of cylindrical mode of magnetron and explain its principle of operation. Explain phase bunching process. 12
- (b) Explain Transmission line resonators in detail. 8
  
5. (a) Why S-parameters are used at microwave frequencies ? List and explain properties of S-parameter matrix. 12
- (b) Explain the working of isolator with neat diagram. 8
  
6. (a) Explain and derive Manley-Rowe power relations. Explain their significance also. 12
- (b) Explain how parametric amplifier can operate as a degenerative negative resistance amplifier. 8
  
7. (a) Explain the operation of Gunn diode using two valley model and explain different modes of Gunn diode. 12
- (b) Explain the dielectric measurement with the help of test bench. 8