

M.Sc. Fourth Semester (Applied Electronics) (New) (CBS)

15057 : Microwave Engineering : 4 AE 1

P. Pages : 2

Time : Three Hours



AV - 3315

Max. Marks : 80

- Notes :
1. Due credit will be given to neatness and adequate dimensions.
 2. Assume suitable data wherever necessary.
 3. Illustrate your answer necessary with the help of neat sketches.
 4. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) Explain the source of noise in conventional tubes, also enlist the different electromagnetic frequency spectrum region. 7

b) With the help of Applegate diagram explain the operation of reflex Klystron. 7

OR

2. a) Explain mode jumping in magnetron. How it can be avoided? 7

b) Explain construction and working of TWT. 7

3. a) Explain Construction, Equivalent Circuit and resistance variation with bias of PIN diode. 6

b) Explain Volt-amp characteristics of tunnel diode using energy level diagram. 7

OR

4. a) Explain V and I Vs time characteristics of IMPATT diode. 6

b) Explain construction and working of Gunn diode. 7

5. a) Derive the expression for electric fields for TM mode in rectangular waveguide. 6

b) The TE₁₀ mode is propagating in a rectangular wave guide with dimensions 6cm × 4cm . By means of travelling detector distance between maxima and minima is found out to be 4.55cm find frequency of propagating wave in guide. 7

6. a) Show that TM₀₁ and TM₁₀ mode in rectangular wave guide do not exist. 6

b) Explain different types of strip line in detail. 7

7. a) Explain working of circulator on the basis of faraday rotation. 6

b) Explain coupling factor, directivity and isolation of directional coupler. 7

OR

8. a) Derive the scattering matrix of N-port junction and write its properties. 6

b) Explain the working of microwave phase shifter. 7

9. Derive the electric field expression for rectangular cavity resonator in TM_{mnp} mode. 7

OR

10. a) Explain Re-entrant cavity and quality factor of cavity resonator. 7
b) Compare the circular cavity resonator and rectangular cavity resonator. 14
11. a) Explain noise in microwave communication system. 6
b) Derive the expression for LOS (Line of Sight) communication range. 7

OR

12. a) Explain troposphere link using frequency diversity. 6
b) Explain different type of fading at microwave frequency. 7
