



(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 121851

Roll No.

--	--	--	--	--	--	--	--	--	--

B. Tech.

(SEM. VIII) THEORY EXAMINATION, 2014-15
MICROWAVE & RADAR

Time : 3 Hours]

[Total Marks : 100

Note : Attempt all problems.

- 1 Justify the validity of following statements **5×4=20**
with reasons : (any four)
- (a) "TEM modes cannot exist in Rectangular Waveguide".
 - (b) "Electrical field, magnetic field and propagation vectors cannot lie in same plane simultaneously."
 - (c) "It is impossible to match all the ports of rat race perfectly".
 - (d) "Spherical waveguide can sustain infinite modes".
 - (e) "Waveguide is a high pass filter.
 - (f) Range and frequency ambiguity cannot be avoided simultaneously.
 - (g) "Directional Coupler is a reciprocal device."

- 2 Answer any two parts of the following : **10×2=20**
- (a) Discuss the properties of scattering matrix. Calculate s matrix for T.
 - (b) Calculate the ratio of effective area of rectangular to circular waves guide if both are working in dominant mode and having same cut off frequency.
 - (c) Discuss :
 - (i) Degenerative Modes
 - (ii) Cavities
 - (iii) Dominant mode
 - (iv) Power capability of waveguide.
- 3 Answer any two parts of the following : **10×2=20**
- (a) Discuss Gunn effect in detail. How domain use to form in it ? What are different modes ? What are the advantages and disadvantages of Cd Te and In P diode.
 - (b) Differentiate :
 - (i) IMPATT and TRAPTT
 - (ii) PIN and AVALANCHE diode
 - (c) Discuss the operation of Reflex Klystron. Prove that its efficiency as 22.7%.
- 4 Answer any two parts of the following : **10×2=20**
- (a) Discuss Radar range equation. What are radar bonds ? Explain the operation of Pulse radar. What use to happen if pulses are tilted and not flat top.

- (b) Discuss the operation of MTI with its block diagram. What are Blinds speeds ? How they are removed ?
- (c) Discuss :
- (i) PPI
 - (ii) Altimeter
 - (iii) A-scope
 - (iv) R-scope
 - (v) Radar cross sectional area (RCS)

5 Write short notes on any four :

5×4=20

- (a) TWT
 - (b) Reflectometer
 - (c) Bolometer
 - (d) Slotted line
 - (e) Magnetron
 - (f) Buncher and Catcher
 - (g) Delay line cancelors.
-