

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

Paper ID : 121851

Roll No.

B.TECH.

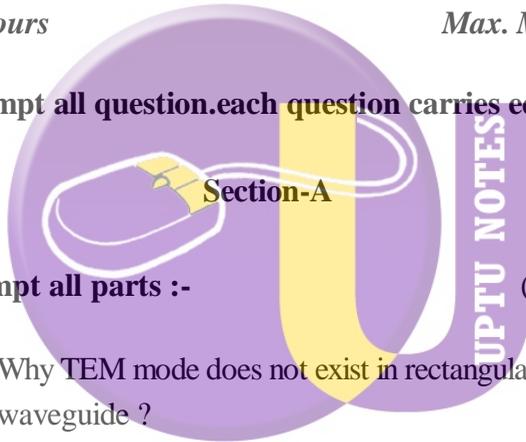
Theory Examination (Semester-VIII) 2015-16

MICROWAVE AND RADAR

Time : 3 Hours

Max. Marks : 100

Note: Attempt all question. each question carries equal marks.



1. Attempt all parts :- (2×10 = 20)

- (a) Why TEM mode does not exist in rectangular and circular waveguide ?
- (b) Define voltage standing wave ratio. Also give its formula in terms of reflection coefficient.
- (c) What are avalanche transit time devices? Also explain impact ionization.
- (d) Define dominant and degenerate modes.

- (e) Why are microwave passive components specified by S-parameters?
- (f) Describe the concept of Doppler frequency shift.
- (g) Define attenuation and insertion loss.
- (h) What is velocity modulation and transit time effect?
- (i) What is basic principle of radar system? Give applications of radar system.
- (j) What do subscripts m & n denotes in rectangular and circular waveguides?

Section-B

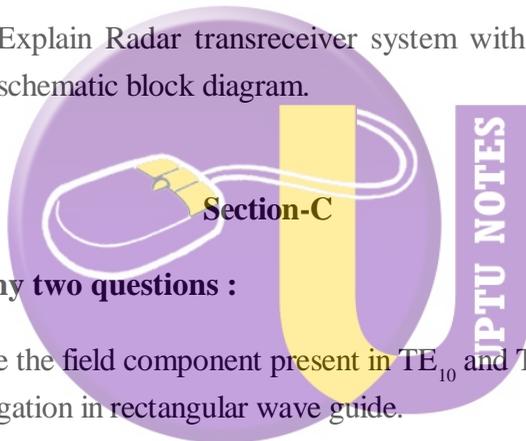
UPTU NOTES

2. Attempt any five questions

[10×5=50]

- (a) Explain MTI radar with suitable block diagram. Give its applications.
- (b) Derive the S-matrix of E-plane Tee when power is fed from auxiliary port. Consider other ports in the matched condition.
- (c) What are the limitations of conventional active devices at microwave frequencies?

- (d) Explain the working of Reflex Klystron with relevant diagram.
- (e) Explain the operating principle and working of FM CW radar.
- (f) Explain the working of PIN diode and Tunnel diode.
- (g) How VSWR of an unknown load can be measured by using reflectometer technique.
- (h) Explain Radar transreceiver system with the help of schematic block diagram.



Attempt any two questions :

(15×2=30)

- 3. Derive the field component present in TE_{10} and TE_{11} mode of propagation in rectangular wave guide.
- 4. Explain the working of travelling wave tube. Explain V-I characteristic of tunnel diode.
- 5. Derive Radar Range Equation. What is Doppler effect and how is it useful in long distance communication?