

2072
B.E. (Electronics and Communication Engineering)
Sixth Semester
EC-601: Microwave and Radar Engineering

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section. Use of scientific calculator is allowed.

x-x-x

Q.1 Attempt all questions: -

- (a) List the various properties of Scattering Matrix. (2)
- (b) What is Avalanche Transit time device? (2)
- (c) What is the difference between E-plane tee and H-plane tee? (2)
- (d) What is velocity modulation? (2)
- (e) For a radar, peak transmitted power is 1 MW, pulse width is 1 μ sec and PRF is 1 kHz. Calculate the average transmitted power. (2)

Section- A

Q. 2 (a) What do mean by Microwave also explain the applications of microwave? (5)

(b) What are applications of magic tee and explain any one . (5)

Q.3 (a) What are cross field devices? How does a Magnetron sustain its oscillations using the cross-field principle? Assume the Pie-Mode for explaining the same. (5)

(b) An IMPATT diode has drift length of 10 μ m. Determine the operating frequency of IMPATT diode if drift velocity for Si is 107 cms/sec. (5)

Q.4 (a) Define and derive expression for reflection coefficient, transmission coefficient and voltage standing wave ratio. (5)

(b) Explain the different methods used for measuring microwave frequency. (5)

Section-B

Q.5 Describe principle of operation for a normal cylindrical magnetron and explain how strapping separates the π mode from other possible modes. (10)

Q.6 (a) With block diagram explain the MTI radar system. Give its limitations. (5)

(b) Explain the more commonly used radar displays (5)

Q.7 (a) Explain with block diagram an FM-CW Radar using sideband super heterodyne receiver. (5)

(b) A tunnel diode can realize a negative resistance amplifier. Justify your answer. (5)

x-x-x