Exam.Code:0930
Sub. Code: 6915

1058

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 (Section-A) which is compulsory and selecting two questions each from Section B-C.

x-x-x

	Section-A	
1	a) Define the mode jumping. b) Compare frequency pushing and frequency pulling. c) Write properties of scattering parameter. d) Write down losses in radar equation. e) Write down application of magic Tee. f) What is the use of S.S. tuners? g) Write down four scanning techniques. h) Define staggered PRFs. i) Compare CW and FMCW radar. j) Write four negative resistance devices.	1x10=10
	Section-B	
2	a) In an *H*-plane *T* – junction, compute power delivered to the loads 40 ohm and 60 ohm connected to arms 1 and 2 when 10 mW power is delivered to matched port 3. b) Define Faraday rotation; explain working of precision type variable attenuator.	5 5
3	a) What is a directional couple? Derive the scattering matrix for a directional coupler. b) In a reflectometer set-up two identical directional couplers are used to measure the incident and reflected power. If the power level of the reverse coupler is 12 dB down from the level of the forward coupler, what is the VSWR on the line?	4 6
4	a) Derive the equation to be satisfied by the Gunn diode to produce the negative resistance, also discuss important conditions for RWH theory. b) A waveguide termination having VSWR of 1.1 is used to dissipate 100 watts of power. Find the reflected power.	6 4
	Section-C	
5	a) Starting from the basic principles derive an expression for the efficiency of a two cavity klystron amplifier. b) Explain the basic principles of radar system. Give the limitations and application of radar.	6 4
6	a) A pulsed cylindrical magnetron is operated with the following parameters; anode voltage 25 kV, beam current 25 A, magnetic density 0.34 Wb/m^2, radius of cathode cylinder 5 cm and radius of anode cylinder is 10 cm, calculate the cut-off magnetic flux density. b) Derive a radar equation with a) pulse compression b) including the missile illumination.	5 5
7	a) How do you distinguish stationary and moving target? Explain the principle and working of an MTI radar. b) A helix TWT is operated with a beam current 250 mA, beam voltage 4.5 kV, and characteristics impedance 45 ohm. If a 50 dB gain is required at 9 GHz, calculate the helix length.	5 5

x-x-x