TIME-3HOUR
MARK-80

ANSWER ANY FIVE QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS

1. a. Derive equations for voltage and current at any point on a transmission line.

b. A transmission line has the following primary constants per km of the line, R= 8O, G= 0.1 , L=3.5mH and C = 9nF. Calculate Zo, a ,ß, Vp and l at W=5000 rad/sec.

c. What are standing waves and SWR?

2. a.Explain in brief single stub matching. State the important expressions related to it?

b.A load impedance of ZR =(60-j80)O is required to be matched to a 50 O Coaxial line by using a short circuited stub of length L located at a Distance 'd' from the load. The wave length of operation is 1 meter. Using smith chart find d and L.

c. Explain the working of four port circulator.

3. a. Explain TM mode of excitation of a rectangular wave guide and derive equations.

b. Explain the construction , working and application of Isolator based on Faraday rotation.

c. Incident power to a directional coupler is 90W. The directional coupler has a coupling factor of 20 dB directivity of 35 dB and insertion loss of 0.5 dB. Find the o/p power at main arm, coupled and isolated parts.

4. a. Explain the construction and working of PIN diode and IMPATT diode.

b. Explain S-matrix representation of multipart network.

c. State and explain the properties of S-parameters.

5. a. Explain with a neat sketch a precision type variable attenuator.

b. Explain magic tree and its application.

c. Explain with sketches different coaxial connectors used for microwave applications.

6. a. Explain the construction and field pattern for microstrip line.

b. What are the different losses taking place in microstrip line?

c. Compare Strip line and microstrip line.

7. a. With the help of a block diagram , explain the operation of a Radar System.

b. What are the applications of Radars?

c. Derive Radar range and equation.

8. a. Explain the principle and working of MTI radar with the help of a Block Diagram.

b. A radar system operates at 6Ghz, 3 MW power out put. If the antenna diameter is 5m and the received band

width is 1.5MHz and has a 12 dB
noise figure, what is the maximum detection range for 1m² target?
c. Write brief notes on:
i) Blind Speeds ii) Delay line cancellers