

Duration :3hrs

Max.Marks:80

N.B. (1) Question No. 1 is compulsory.

(2) Attempt any three questions out of remaining five.

(3) Figures to the right indicate full marks.

(4) Assume suitable data if required and mention the same in answer sheet

1. Solve any four : 20
 - a) Give the Advantages and Disadvantages of Microstrip Antenna?
 - b) Draw and explain any one indirect feeding technique of MSA with suitable diagrams
 - c) Define the parameters Gain, Directivity, Antenna efficiency, Axial ratio and radiation pattern for a Microstrip antenna.
 - d) Define Circular Polarisation and classify its types?
 - e) Calculate Impedance bandwidth of MSA with input impedance of antenna as 75Ω and characteristic impedance of feed line as 70Ω . Assume quality factor to be 10?
2. (a) Design a rectangular microstrip antenna with FR4 substrate having $\epsilon_r = 4.4$, $h = 1.6$ mm for a fundamental TM_{10} mode at 2GHz. Also, comment on the feed point location of the antenna? 10
- (b) (i) Explain the effect of variation of width of RMSA (W) on its gain? 10
(ii) Differentiate between radiating edge gap coupled RMSA and non-radiating edge gap coupled RMSA?
3. (a) Emphasize the importance of Circular Polarisation in communication systems? How do we achieve dual feed circular polarization in MSA? 10
- (b) With the help of a neat diagram explain U-slot technique? 10
4. (a) Design circular microstrip antenna for 10 GHz frequency application using substrate $\epsilon_r = 2.2$ with the thickness of 0.1588 cm? 10
- (b) Compare CMSA and RMSA? 10
5. (a) Give the need for Compact MSA's? List the various compact MSA configurations? Explain any one RMSA compact technique in detail? 10
- (b) Draw and explain the electromagnetically coupled MSA configuration? 10

6. Write short note on:

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- a) MIMO Patch Antenna
- b) Transmission line model
- c) Reconfigurable antennas for wireless communication
- d) Wearable antennas for wireless communication
