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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)B.Tech III Year II Semester Supplementary Examinations February-2022
ANTENNAS AND WAVE PROPAGATION
(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

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|---|---|--|----|
| 1 | a | Define Radiation Pattern of an antenna | 2M |
| | b | What are the salient features of horn antenna? | 2M |
| | c | What are the advantages of Cassegrain feed system? | 2M |
| | d | What is the difference between BSA and EFA? | 2M |
| | e | What is meant by Multi hop propagation? | 2M |

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

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|---|---|---|----|
| 2 | a | Explain about Antenna Noise Temperature and Radiation Resistance. | 4M |
| | b | An antenna has a radiation resistance is 72Ω and a loss resistance is 8Ω . If the power gain is 16. Calculate the directivity of the antenna. | 6M |

OR

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|---|---|---|----|
| 3 | a | Discuss about Antenna Parameters & its types | 4M |
| | b | Derive expression for Electric and Magnetic Field radiated by Quarter Wave Monopole | 6M |

UNIT-II

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|---|---|---|----|
| 4 | a | Discuss about the helical antenna geometry, Normal mode of radiation and its applications | 5M |
| | b | Calculate the directivity of 20 turn helix with $\alpha = 12$ degrees and circumference equals to one wavelength. | 5M |

OR

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|---|---|--|----|
| 5 | a | Describe Normal mode and axial mode in helical antenna and Pitch angle | 4M |
| | b | Design Yagi-Uda antenna of six elements to provide a gain of 12dB if the operating frequency is 200 MHz. | 6M |

UNIT-III

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| 6 | a | Explain near & far fields with respect to antenna measurements. | 4M |
| | b | Explain Gain measurement by direct comparison method. | 6M |

OR

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| 7 | a | Draw and explain the principle of parabolic reflector. | 6M |
| | b | A parabolic dish provides a power gain of 50 dB at 10 GHz with 70% efficiency. Find out (i)HPBW (ii) BWFN and (iii) Diameter | 4M |

UNIT-IV

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|---|---|---|----|
| 8 | a | What is principle of pattern multiplication? List the advantages and disadvantages. | 4M |
| | b | Show that Directivity of EFA, $L \gg d$ is $D_0 = 4(d/\lambda)$ | 5M |

OR

- 9 a Define and differentiate Broad side array with end fire array 4M
- b Explain End fire array with increase directivity and derive the directivity equation. 6M

UNIT-V

- 10 a Explain the relation between MUF and skip distance. 6M
- b Describe the energy loss in Ionosphere. 4M

OR

- 11 a Discuss about Virtual height and its significance. 4M
- b Explain Maximum usable frequency with its expression 6M

END