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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_

**End Semester Examination – Nov/Dec - 2016**

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| **Code :** | **12EC217** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **Antennas and Wave Propagation** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Marks** | |
| **PART-A(10X1=10 MARKS)** | | | |
| 1. | Define Radiation Pattern. | (1) | |
| 2. | State Maximum Power transfer Condition. | (1) | |
| 3. | What is Array Factor? | (1) | |
| 4. | What are Collinear arrays? | (1) | |
| 5. | Give an example for resonant and non resonant antenna. | (1) | |
| 6. | The Gain (dB) of Yagi-Uda Antenna is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | (1) | |
| 7. | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an antenna used in smart-phone applications. | (1) | |
| 8. | The horn antenna is an analogy of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ transmission line. | (1) | |
| 9. | Give the Ku and C band frequency of Communication. | (1) | |
| 10. | Doordarshan TV channel reception is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Propagation. | (1) | |
| **PART B(5 X 3= 15 MARKS)** | | |
| 11. | What is retarded vector potential? | (3) |
| 12. | Obtain the relation between effective aperture and directivity. | (3) |
| 13. | Why log periodic antenna is said to be frequency independent? | (3) |
| 14. | Find the terminal impedance of a thin slot antenna when the impedance of a thin dipole antenna is 73 + j 42.5 ohms. | (3) |
| 15. | Define critical frequency of an ionized layer of ionosphere. | (3) |

**PART C(5 X 15= 75 MARKS)**

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| 16. | Derive the power radiated and radiation resistance of half-wave dipole antenna. | (15) |
|  | (OR) |  |
| 17. | State and prove reciprocity theorem. | (15) |
| 18. | Illustrate the significance of binomial arrays with necessary design equations. | (15) |
|  | (OR) |  |
| 19. | Describe the principles of End fire arrays. Find array factor, maxima and minima for 4 element array? | (15) |
| 20. | Describe the radiated fields of Helical antenna and its modes of operation with neat diagram. | (15) |
|  | (OR) |  |
| 21. | Describe a Rhombic antenna starting from the expression    For the relative field strength in the vertical plane passing through rhombic axis, derive the maximum E design for the rhombic antenna | (15) |
| 22. | Enumerate the radiation and directivity from a rectangular aperture treated as a array of Huygens’s source. | (15) |
|  | (OR) |  |
| 23. | With necessary design equation, explain the radiations from a Microstrip antenna. | (15) |
| 24. | Discuss the layers of ionosphere with its characteristics and diagram for wave propagation in detail. | (15) |
|  | (OR) |  |
| 25. | Explain Ground wave Propagation in detail. | (15) |