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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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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **12EC211** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **TRANSMISSION LINES AND WAVE GUIDES** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **Marks** |
| **PART-A(10X1=10 MARKS)** | | |
| 1. | Define Characteristic impedance. | (1) |
| 2. | What are the primary and secondary constants in a transmission line? | (1) |
| 3. | Define standing wave ratio. | (1) |
| 4. | Give the relation between reflection coefficient and impedance. | (1) |
| 5. | Give the significance of using one eighth line. | (1) |
| 6. | \_\_\_\_\_\_\_\_\_\_\_ is the center point in a Smith Chart. | (1) |
| 7. | Define dominant mode. | (1) |
| 8. | Give the cut-off frequency of TE wave in a parallel plate waveguide. | (1) |
| 9. | List the modes that exist in a rectangular waveguide. | (1) |
| 10. | Define a cavity resonator. | (1) |

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| **PART B(5 X 3= 15 MARKS)** | | |
| 11 | Discuss about loading and its types. | (3) |
| 12 | Derive the secondary constants of a zero dissipation line. | (3) |
| 13 | Explain about stub matching. | (3) |
| 14 | List the characteristics of TEM waves. | (3) |
| 15 | Why TEM mode does not exist in a rectangular waveguide. | (3) |

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| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. | a. | Explain briefly about the various types of transmission lines. | (10) |
| b. | Discuss about the losses in a transmission line. | (5) |
| (OR) | | | |
| 17. |  | A generator of 10 KHz, and supplies power to a 2 miles open wire line terminated in its characteristic resistance. The line parameters are:  R = 30 Ω/mile, L = 2.2mH/mile, G = 20 ns/mile, C 80 nf/mile  Calculate  a. Characteristic Impedance Z0  b. Propagation Constant γ  c. Phase velocity  e. Delivered power | (15) |
| 18. |  | Discuss about voltages and currents on a dissipation less line and sketch the voltage and current waveforms for a transmission line of length ‘λ’ with the  following resistive loads  a) Short circuited load  b) Open circuited load  c) Matched load | (15) |
| (OR) | | | |
| 19. | a. | Briefly discuss about reflection factor and reflection loss in a transmission line. | (7) |
| b. | Derive the relationship between VSWR and reflection co-efficient. | (8) |
| 20. |  | Derive the input impedance of a λ/4 and λ/2 section transmission line and mention its applications. | (15) |
| (OR) | | | |
| 21. |  | A lossless 100 Ω transmission line is terminated in a load admittance Y = (0.03-j0.02) mhos. Using Smith Chart, determine the distance from the load to the first current minimum and to the first current maximum. Assume the wavelength to be 15 cm. | (15) |
| 22. |  | A pair of perfectly conducting planes is separated by 8 cm in air. For a frequency of 5GHz with TM1 mode excited, find the cut-off frequency, characteristic impedance, Phase velocity and group velocity. | (15) |
| (OR) | | | |
| 23. |  | Derive the attenuation factor of TE waves in a parallel plate waveguide. | (15) |
| 24. |  | Derive the electric and magnetic field configuration of a TE waves in a rectangular waveguide. | (15) |
| (OR) | | | |
| 25. |  | Discuss about:  a) Cavity Resonators  b) Cavity Excitation and tuning | (15) |

ALL THE BEST