****

**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**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **09EC223** | **Duration :** | **3 hrs** |
| **Sub. Name:** | **MICROWAVE &OPTICAL COMMUNICATION ENGINEERING** | **Max. Marks:** | **100** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Q. No.** | **Questions** | **Course outcome** | **Marks** |
| **PART-A(10X1=10 MARKS)** | | | |
| 1. | What are the cavities present in two cavity klystron | C01 | 1 |
| 2. | Mention any two microwave sources | C01 | 1 |
| 3. | What is waveguide corner | C01 | 1 |
| 4. | What is the frequency of X band in microwave communication | C01 | 1 |
| 5. | What do you mean by Hull cut off in Magnetron | C01 | 1 |
| 6. | Give an example for transfer electron device(TED) | C01 |  |
| 7. | How will you classify fiber based on material | C01 | 1 |
| 8. | State Snell’s law | C01 | 1 |
| 9. | When the angle of incidence is equal to the critical angle, what will happen to a ray of light passing from denser medium to rarer medium? | C01 | 1 |
| 10. | What are the applications of LED | C01 | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| **PART B(5 X 3= 15 MARKS)** | | | |
| 11 | What is the scattering matrix of 4-port circulator | C01 | 3 |  |
| 12 | How velocity modulation is achieved in magnetron | C01 | 3 |  |
| 13 | Explain the energy band diagram of GUNN diode? | C01 | 3 |  |
| 14 | Why do we need photo detectors in optical communication | C01 | 3 |  |
| 15 | What are the causes for dispersion in optical fiber? | C01 | 3 |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PART C(5 X 15= 75 MARKS)** | | | | |
| 16. | a. | Compare the working of E and H plane Tee and derive scattering matrix for each | C01 | 15 |
| b. |  |  |  |
| c. |  |  |  |
| d. |  |  |  |
| e. |  |  |  |
| (OR) | | | | |
| 17. | a. | Construct 2 port isolator and explain its operation? | C01 | 7 |
| b. | What are the methods to excite a waveguide |  | 8 |
| c. |  |  |  |
| d. |  |  |  |
| e. |  |  |  |
| 18. | a. | Explain the principle of operation of two –cavity klystron with neat diagram | C01 | 15 |
| b. |  |  |  |
| c. |  |  |  |
| d. |  |  |  |
| e. |  |  |  |
| (OR) | | | | |
| 19. | a. | Explain the working of reflex klystron with neat diagram. | C01 | 8 |
| b. | With neat diagram, elucidate the working principle of amplifier which is used for satellite applications. | C01 | 7 |
| c. |  |  |  |
| d. |  |  |  |
| e. |  |  |  |
| 20. | a. | Compare READ and TRAPATT diodes with neat diagrams | C01 | 15 |
| b. |  |  |  |
| c. |  |  |  |
| d. |  |  |  |
| e. |  |  |  |
| (OR) | | | | |
| 21. | a. | What are the modes of operation of GUNN diode | C01 | 6 |
| b. | How will you measure the impedance of unknown load | C01 | 9 |
| c. |  |  |  |
| d. |  |  |  |
| e. |  |  |  |
| 22. | a. | Discuss about the disturbance through attenuation in fiber optic communication? | C01 | 10 |
| b. | What are the advantages of optical communication over electrical communication? | C01 | 5 |
| c. |  |  |  |
| d. |  |  |  |
| e. |  |  |  |
| (OR) | | | | |
| 23. | a. | With neat diagram explain about fiber optic communication system. | C01 | 12 |
| b. | Calculate the numerical aperture and acceptance angle for an optical fiber of which the refractive index of core is 1.5 and refractive index of cladding is 1.48. | C01 | 3 |
| c. |  |  |  |
| d. |  |  |  |
| e. |  |  |  |
| 24. | a. | Differentiate spontaneous and stimulated emission | C01 | 6 |
| b. | Explain the three basic operations in LASER through energy level diagram | C01 | 9 |
| c. |  |  |  |
| d. |  |  |  |
| e. |  |  |  |
| (OR) | | | | |
| 25. | a. | Explain the construction and operation of Avalanche photodiode in detail | C01 | 15 |
| b. |  |  |  |
| c. |  |  |  |
| d. |  |  |  |
| e. |  |  |  |

ALL THE BEST