| Reg. No. | | | | | | | | | | | | |
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| Question Paper Code | 12366 |
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**M.E. / M.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023**

First Semester

**M.E.-Communication Systems**

**20PCOPC103 - OPTICAL NETWORKS**

(Regulations 2020)

Duration: 3 Hours Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

| | | *Marks, K-Level, CO* |
|---|---|---|
| 1. | Define the function of circulators. | *2,K1,CO1* |
| 2. | List the features and applications of Solitons. | *2,K1,CO1* |
| 3. | What is wavelength stabilization? | *2,K1,CO2* |
| 4. | Name the key design parameters of a transmitter. | *2,K1,CO2* |
| 5. | Label the synchronous and asynchronous multiplexing with the help of a diagram. | *2,K1,CO3* |
| 6. | Show the functionality of generic framing procedure. | *2,K1,CO3* |
| 7. | Find the basic principle behind the WDM. | *2,K1,CO4* |
| 8. | Label the topology of a conventional optical TDM System. | *2,K1,CO4* |
| 9. | What type of complementary method is used to increase the capacity of a DWDM System? | *2,K1,CO5* |
| 10. | Define the role of ADM in an optical Network? | *2,K1,CO5* |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

| | | | |
|---|---|---|---|
| 11. | a) | Illustrate the characteristics of EDFA optical amplifier in detail. Derive its gain expression and mention its potential amplifications. | *13,K2,CO1* |
| | | **OR** | |
| | b) | Summarize the main categories of nonlinear effects that occur in optical communication systems. | *13,K2,CO1* |
| 12. | a) | Explain the power penalty of two systems which has the same peak transmit power. | *13,K2,CO2* |
| | | **OR** | |
| | b) | Compare the limitations due to intermodal dispersion, chromatic dispersion and polarization mode dispersion and explain in detail about the operation of polarization mode dispersion. | *13,K2,CO2* |
| 13. | a) | Outline the idea of digital wrapper with the help of a neat diagram. | *13,K2,CO3* |

**OR**

b) Demonstrate in detail the layered model of SONET/SDH Layered model and explain their function. *13,K2,CO3*

14. a) Summarize about the operation of the WDM in optical network with the help of a neat diagram. *13,K2,CO4*

**OR**

b) Illustrate a general view about WDM Cross connects. *13,K2,CO4*

15. a) Demonstrate how does wavelength add-drop multiplexer supports the management of fiber capacity ? *13,K2,CO5*

**OR**

b) Explain the higher dispersion for DWDM. *13,K2,CO5*

## PART - C (1 × 15 = 15 Marks)

16. a) Organize the scope of Optical Ethernets and Ethernet PONs. *15,K3,CO6*

**OR**

b) Construct & Show how does the MPLS nodes perform with a neat diagram. *15,K3,CO6*