Exam.Code:0932
Sub. Code: 33699

2015

B.E. (Electronics and Communication Engineering)

Eighth Semester

EC-803: Optical Networks

Time allowed: 3 Hours Max. Marks: 50

***NOTE:*** *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit. Unless stated otherwise, the symbols have their usual meaning in context with subject. Assume suitably and state additional data required, if any.*

x-x-x

I. Attempt the following:-

a) State any two challenges faced by optical WDM networks.

b) Summarize the effects of crosstalk in SOA.

c) Outline the features of an optical switch.

d) Define laser relative intensity noise.

e) List the layers of SONET protocol. (5x2)

**UNIT - I**

II. a) Explain the use of WDM in optical networks for increasing the capacity. Mention the difference between frequency division and wavelength division multiplexing and why WDM is preferred in optical communication over FDM?

b) Discuss the operation of DWDM in optical networks with the help of a neat diagram. (2x5)

III. a) Discuss the characteristics of an EDFA in detail. Derive its gain expression and mention its potential applications. (2+3)

b) Why Erbium is used for amplifier design? Analyze how stimulation emission occurs in an EDFA. (2+3)

IV. a) Discuss the advantages of a laser over an LED. Determine the modes of operation of a laser and mention the range of its drive current. (3+4)

b) How a vertical-cavity surface-emitting laser (VCSEL) better than other type of lasers? (3)

**UNIT - II**

V. a) Summarize the key elements of PON technology.

b) Discuss the scope of Optical Ethernets and Ethernet PONs. (2x5)

P.T.O.

VI. a) Demonstrate an OXC with the help of a functional diagram. (3)

b) State the advantages of using a multi-hop network over single-hop networks. (2)

c) Frame the architecture of a wavelength routing network and explain its key elements. Classify the Routing Wavelength Assignment (RWA) algorithms on the basis of their functioning. (3+2)

VII. a) Discuss the major functional components of a SONET link.

b) Illustrate the rules and actions used for detection of problems and failure on a link through SONET. (2x5)

*x-x-x*