C 20272 (Pages : 2) Name.....

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2006

EC 2K 802—OPTICAL COMMUNICATION

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

I. (a) What is normalized frequency ? Explain its significance.

(b) Explain the features of DSF.

(c) Explain the concept of line width in LASER spectrum.

(d) Explain the need for pre-amplifiers in detail.

(e) What are Coherent and non-Coherent fiber bundles ? Explain. Give their applications.

(f) Justify the statement : "Dispersion limits the Information carrying capacity of the fiber".

(g) What is an optical repeater ? Explain in detail its features.

(h) What is WDM ? Explain its types.

(8 × 5 = 40 marks)

II. (a) (i) Explain in detail the following :—

1 Numerical Aperture.

2 Acceptance cone.

3 Mode field diameter.

(7 marks)

(ii) Compare the parameters of single mode and multi-mode glass fibers. (8 marks)

Or

(b) (i) Explain how attenuation limits the information carrying capacity of optical fibers with equations.

(7 marks)

(ii) Explain the non-linear self phase modulation effect in single mode fibers. (8 marks)

III. (a) (i) Explain the principle of operation of semiconductor LASER diode with a neat sketch.

(7 marks)

(ii) Explain the requirements of an ideal optical source and an ideal optical detector.

(8 marks)

Or

(b) Draw neat sketches of pin photodetector and APD. Explain their detection principle in detail. (15 marks)

IV. (a) (i) Explain :

1 Meridional Ray.

2 Skew Ray. (7 marks)

(ii) Explain the need for equalization in optical fibers. (8 marks)

Or

(b) (i) Differentiate :

1 Coherent from non-coherent optical bundles. (7 marks)

2 Homodyne from heterodyne systems. (8 marks)

V. (a) Draw a neat diagram of EDFA. Explain its principle of operation. (15 marks)

Or

(b) Write short notes on :

1 Intermodulation effects in optical amplifiers. (7 marks)

2 Wavelength range of operation of optical amplifiers. (8 marks)

[4 × 15 = 60 marks]