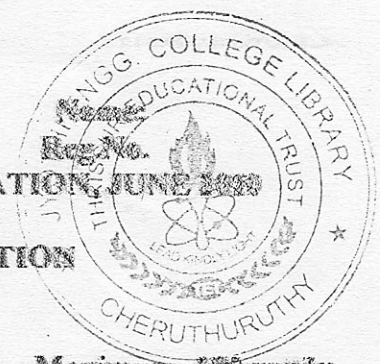


EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, JUNE 2008

EC.2K.802 - OPTICAL COMMUNICATION



Time: Three hours

Maximum: 100 marks

- I. (a) Give the Maxwells equations that give the relationships between electric and magnetic fields.
 (b) what are the loss or signal attenuation mechanisms in a fiber?
 © explain the temperature dependent behavior of the optical output power as a function of the bias current for a particular laser diode?
 (d) Briefly explain any one trans-impedance optical receiver?
 (e) Write a note on Inter Symbol Interference (ISI)?
 (f) Explain the degradation due to fiber dispersion.
 (g) Briefly explain about erbium doped fibers.
 (h) What is saturation induced crosstalk? Explain.

- II. (a) (i) State Snell's Law for refraction and outline its significance in fiber optic cables.
 (ii) explain the propagation modes in single-mode fibers.

(or)

- (b) (i) Why and to what degree do optical signals get distorted as they propagate along a fiber?
 (ii) Write a note on dispersion shifted and dispersion flattened fibers.

- III. (a) (i) With neat sketch explain the operation of a Laser diode.
 (ii) Briefly explain the principle of operation of a Light Emitting diode.

(or)

- (b) Explain in detail about the operation of a
 (i) PIN Diode
 (ii) Avalanche Diode

- IV. (a) (i) Compare Homodyne and Heterodyne detection
 (ii) explain in detail about OOK and PSK homodyne systems.

(or)

- (b) explain in detail about degradation induced by nonlinear effects in fiber propagation.

- V. (a) Explain the principle of operation of a
 (i) Raman Amplifier
 (ii) Brillouin Amplifier

(or)

(b) Explain in detail about

- (i) Amplifier Noise
- (ii) Signal to Noise ratio
- (iii) Gain Bandwidth.

(15x1=60 marks)

(or)

II. (a) State Snell's Law for reflection and outline its significance in fiber optics.
 (b) Explain the propagation modes in single mode fiber.

(or)

(b) (i) Why and to what degree do optical signals get distorted as they propagate along a fiber?
 (ii) Write a note on dispersion shifted and dispersion flattened fibers.

III. (a) (i) With neat sketch explain the operation of a laser diode.
 (ii) Briefly explain the principle of operation of a laser emitting diode.

(or)

(b) Explain in detail about the operation of a
 (i) PIN Diode
 (ii) Avalanche Diode

IV. (a) (i) Compare Homodyne and Heterodyne detectors.
 (ii) Explain in detail about FSK and PSK Homodyne systems.

(or)

(c) Explain in detail about degradation induced by nonlinear effects in fiber propagation.

V. (a) Explain the principle of operation of a
 (i) Raman Amplifier
 (ii) Brillouin Amplifier

(or)