17633

21415

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **20**

a) Draw and explain block diagram of optical fiber communication system.

b) Draw and explain the construction of fiber optics cable.

c) Define following terms:

(i) Numerical aperture

(ii) Acceptance angle

(iii) Critical angle

(iv) Total internal reflection

d) Classify optical fiber with respect to index profile and mode of propagation.

Marks

e) Explain absorption and scattering losses in fiber optics.

f) Determine NA, acceptance angle and critical angle of the fiber having core refractive index is 1.5 and cladding refractive index is 1.45.

g) Define splicing? Explain fusion splicing of optical fiber.

2. Attempt any FOUR of the following: **16**

a) With neat sketch explain working LED as optical source with diagram.

b) Explain lateral and angular fiber misalignment.

c) Explain ST and SMA optical fiber connector.

d) Compare LED and LASER diode. (Any four points)

(i) Intensity of light

(ii) Spectral width

(iii) Efficiency

(iv) Symbol.

e) Draw construction of photo diode and explain its working as optical detector.

f) State any four properties of good optical connectors.

Marks

3. Attempt any FOUR of the following: **16**

a) Draw block diagram of OTOR and explain its working.

b) State any two advantages and disadvantages of wave division multiplexing optical fiber communication (OFC) system.

c) Explain the working of avalanche diode as optical detail and state its any two advantages.

d) Draw and explain block diagram of optical analog system.

e) Explain the concept of synchronous optical networking (SONET) using its architecture diagram.

f) Explain bending losses in optical fibers.

4. Attempt any FOUR of the following: **16**

a) Explain inter modal and intro modal dispersion which occurs in optical fiber.

b) With help of diagram explain fiber optic cable fabrication.

c) State different non-semiconductor laser diode. Explain any one in brief.

d) Draw the construction of PIN diode and explain its working.

e) Draw frequency spectrum for communication and show the region for optical communication system.

f) Explain the concept of wavelength division multiplexing in optical fiber communication system.

Marks

5. Attempt any FOUR of the following: **16**

a) Explain the concept of hybrid multichannel analog optical fiber communication system.

b) Explain construction and working of edge emitter LED.

c) Explain chromatic losses in brief which occurs in fiber optics.

d) Compare photo diode and PIN diode (Four points).

e) Compare single mode and multi mode fiber. (Any four points).

f) Explain scattering and dispersion of light through optical fiber cable.

6. Attempt any FOUR of the following: **16**

a) What are the different mechanical splicing? Explain any one in detail.

b) Explain optical isolator and circulator.

c) With block diagram explain the concept of undersea optical communication system.

d) State any two advantages, two disadvantages optical fiber communication system.

e) With structure of semiconductor LASER diode explain its working.

f) With neat sketch explain working of He-neon laser.