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BT-7/D09

OPTICAL COMMUNICATION (2004-05)

Paper : ECT-407

Time : Three Hours] [Maximum Marks : 75

Note : Question No. 1 is compulsory. Answer in all *five* questions, selecting *one* question from each unit.

1. (a) Explain what is Acceptance cone.

(b) Derive the relation between Numerical aperture and Refractive indexes.

(c) Discuss the effect of Leaky modes.

(d) Draw the frequency response of Semiconductor lasers.

(e) Differentiate Coherent and Non-coherent detection and their effects.

(f) Mention the various noise soures in optical fibre communication.

(g) What is Optical amplifier ? Why is it required ?

(h) Explain Photonic network in brief.

(i) Explain the term Dispersion. How does it affect the performance of the system ?

(j) What is mode in an optical fibre communication system ? 15

UNIT–I

2. (a) Differentiate between splices and connectors. 8

(b) Compare single mode and multi-mode fibres with their applications. 7

3. (a) Explain the process of propagation of light within the optical fibre with the help of suitable diagrams. 8

(b) An optic fibre is made of silica with core refractive index of 1.50 and a cladding refractive index of 1.47. Determine : (i) The critical angle at the core-cladding interface.

(ii) The Numerical aperture of the fibre.

(iii) The Acceptance angle in air for the fibre. 7

UNIT–II

4. What are the various losses in an optical fibre ? Explain with the help of suitable diagrams. 15

5. (a) Explain the types of dispersion. Also explain the factors behind these types. 10

(b) Explain how dispersion affects the bandwidth. 5

UNIT–III

6. (a) Differentiate between LED and LASER. 8

(b) Explain the significance of stimulation in LASERs. 7

7. (a) Discuss the operation of P-I-N diode. 8

(b) What are the various characteristics of an optical detector ? 7

UNIT–IV

8. (a) Differentiate Single hop and Multi-hop networks with their areas of application. 7

(b) Describe the working of a photonic network. 8

9. (a) Discuss the significance of Wavelength division multiplexing. 9

(b) Explain the operation of optical coupler. 6