

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/  
COMMERCIAL PRACTICE , APRIL – 2023**

**OPTICAL FIBRE COMMUNICATION**

(Maximum Marks : 100)

(Time : 3 hours)

**PART – A**  
(Maximum Marks : 10)

Marks

**I.** Answer **all** questions in one or two sentences. Each question carries 2 marks.

1. List any two advantages of optical fibre communication.
2. Name the three types of rays that can propagate in a fiber.
3. Define acceptance angle.
4. Name the two light sources used in fibre optic communication transmitter.
5. Give the uses of optical isolator.

(5x2=10)

**PART – B**  
(Maximum Marks : 30)

**II.** Answer any **five** of the following questions. Each question carries 6 marks.

1. Explain the classification of optical fibre based on the modes of operation.
2. Describe the phenomenon of absorption, scattering and dispersion of light.
3. Differentiate between direct and indirect bandgap semiconductors.
4. Explain the principle of LASER.
5. Describe the types of optical amplifiers.
6. Explain the principle of optical fiber directional coupler.
7. Explain attenuation losses in optical fiber and how it is measured.

(5x6=30)

**PART – C**

(Maximum Marks : 60)

(Answer **one full** question from each unit. Each full question carries 15 marks)

**UNIT – I**

- III.** (a) With neat sketches explain how light is transmitted in an optical fiber. (10)  
(b) Describe different types of fiber materials. (5)

**OR**

- IV.** (a) Differentiate between step index and graded index fibre. (10)  
(b) Describe elements of physical optics. (5)

**UNIT – II**

- V.** (a) With neat sketches explain the structure of surface emitting and edge emitting LEDs. (8)  
(b) Explain the modulation of LED. (7)

**OR**

- VI.** (a) Explain the structure of LASER diode and explain its operation. (8)  
(b) Explain the working principle of PIN diode. (7)

**UNIT –III**

- VII.** (a) Draw and explain the block diagram of optical fiber communication system. (8)  
(b) Explain the basic concept of optical amplifiers. (7)

**OR**

- VIII.** (a) Draw and explain the block diagram of optical transmitter. (8)  
(b) Describe the principle of WDM. (7)

**UNIT – IV**

- IX.** (a) Describe various losses in optical fiber. (8)  
(b) Explain the methods of measurement of attenuation losses in optical fiber. (7)

**OR**

- X.** (a) Explain the principle of optical fiber directional coupler and mention its applications. (8)  
(b) Describe the working of beam splitters. (7)

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