

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2022**

OPTICAL COMMUNICATION

[Maximum Marks: **100**]

[Time: **3 Hours**]

PART-A

(Maximum Marks: **10**)

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

1. State the principle of total internal reflection.
2. Define Numerical aperture.
3. Draw the simple energy band diagram for a PIN diode.
4. List the types of optical amplifiers.
5. Mention the need for an optical isolator.

(5 x 2 = 10)

PART-B

(Maximum Marks: **30**)

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

1. State absorption, scattering, and dispersion in fibers.
2. Write short notes on acceptance angle.
3. Compare direct band gap and indirect band gap semiconductors.
4. Explain the principle of photo detection.
5. Draw the block diagram of optical transmitter and explain.
6. Write short notes on Raman amplifier.
7. List the requirement of a good connector.

(5 x 6 = 30)

PART-C

(Maximum Marks: **60**)

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

UNIT – I

III. (a) Explain different types of optical fibers based on their refractive index and number of modes. (9)

(b) Describe meridional rays and skew rays. (6)

OR

- IV. (a) Describe different types of materials used in optical fibers. (8)
(b) List the advantages of fiber optical fiber communication. (7)

UNIT – II

- V. (a) Draw the structure of edge emitting LED and explain. (8)
(b) With necessary diagrams explain the working of avalanche photo diode. (7)

OR

- VI. (a) Draw the structure of Laser diode and explain. (9)
(b) Explain the modulation of LED. (6)

UNIT- III

- VII. (a) Draw the block diagram of optical communication system and explain. (9)
(b) Explain Wave length division multiplexing. (6)

OR

- VIII. (a) Draw the block diagram of optical receiver and explain. (8)
(b) Explain the basic principle of EDFA with suitable diagrams. (7)

UNIT - IV

- IX. (a) Describe the signal attenuation mechanism in optical fibers. (9)
(b) Write short notes on optical circulators. (6)

OR

- X. (a) Explain about different type of fiber couplers. (8)
(b) Explain different splicing techniques used in OFC system . (7)
