TED (15) 5045 (Revision – 2015)

# A22 - 08384

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## 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.

### 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.

#### 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.  |  |

(b) Describe meridional rays and skew rays.

### OR

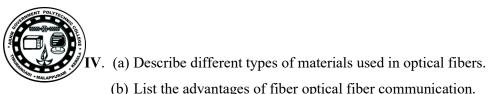


(5 x 2 = 10)

 $(5 \times 6 = 30)$ 

(9)

(6)



# http://gptcthirurangadi.in (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. |     |  |  |  |
|--|-----|--|--|--|
| (b) Explain Wave length division multiplexing.                               | (6) |  |  |  |
| OR   |     |  |  |  |
| VIII. (a) Draw the block diagram of optical receiver and explain.            |     |  |  |  |
| (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) |  |  |  |
| OP   |     |  |  |  |

OR

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

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