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(Revision-2015/19)

A25 - 7867

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL - 2025

OPTICAL FIBRE COMMUNICATION

[Maximum marks: 100] [Time: 3 Hours]

PART – A
Maximum marks: 10

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

1. Define scattering.
2. Give the principle of photo detection.
3. Give basic concept of optical amplifiers.
4. Define splicer.
5. List any two advantages of optical fiber directional coupler. (5 x 2 = 10)

PART – B
Maximum marks: 30

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

1. Briefly describe different types of ray in optic fibre.
2. List any five advantages of optic fibre.
3. Explain the modulation of LED.
4. Differentiate direct and indirect gap.
5. List any five advantages of Raman amplifiers.
6. Explain the basic idea of wavelength division multiplexing.
7. Explain absorption losses and fibre bend losses. (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 the classification of optical fibre types based on transmission mode. (8)

(b) Explain the structure of an optical fibre. (7)

OR

IV. (a) Derive the equation for numerical aperture. (8)

(b) Describe the elements of physical optics. (7)

UNIT - II

V. (a) Explain the structure and working of surface emitting LEDs. (8)

(b) Explain the structure and working principle of PIN photodiode. (7)

OR

VI. (a) Briefly explain the theory of laser action. (8)

(i) Absorption of radiation (ii) Emission of radiation

(iii) Population inversion (iv) Stimulated emission.

(b) Explain the structure and working principle of avalanche photodiode. (7)

UNIT - III

VII. (a) With the help of block diagram, explain the basic optical communication system. (8)

(b) With the help of block diagram, explain optical transceivers. (7)

OR

VIII. (a) With the help of block diagram, explain optical transmitter. (8)

(b) Explain the working principle of semiconductor optical amplifiers. (7)

UNIT – IV

IX. (a) Describe in brief about beam splitters and optical modulators. (8)

(b) Briefly explain different types of fibre couplers. (7)

OR

X. (a) Explain the insertion loss methods of measurement of attenuation losses in optical transmission. (8)

(b) Describe in brief about optical isolator and circulator. (7)
