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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, NOVEMBER-2021

OPTICAL FIBRE COMMUNICATION

[Maximum marks: 75] (Time: 2.15 Hours)

PART – A

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

1. Define Numerical Aperture (NA).
2. What is population inversion?
3. What are the different types of optical amplifiers?
4. Write any two advantages of EDFA?
5. What are the different types of scattering occur in optical fibre. (3 x 2 = 6)

PART – B

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

1. Explain the principle of light transmission in optical fibre.
2. Explain the ray types in optical fibre.
3. Explain the theory of LASER action.
4. Explain the principle of photo detectors.
5. Draw the block diagram of optical transceivers.
6. Explain bending losses in optical fibres.
7. Explain the principle of operation of optical isolator. (4 x 6= 24)

PART – C

(Answer ***any of the three units*** from the following. Each full question carries 15 marks)

UNIT –I

III. (a) Explain various types of optical fibres based on refractive index of material. (10)

(b) What are the advantages of optical fibre? (5)

OR

IV.(a) Explain single mode and multimode fibres. (10)

(b) Explain different types of fibre materials. (5)

UNIT-II

V. (a) Explain the structure of Edge Emitting LED. (8)

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

OR

VI.(a) Explain the structure of semiconductor LASER diode and distinguish between LASER and LED (8)

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

UNIT-III

VII.(a) Explain the block diagram of optical fibre communication system. (9)

(b) Explain the principle of Wavelength Division Multiplexing (WDM). (6)

OR

VIII.(a) Explain the working principle of EDFA. (9)

(b) Draw the block diagram of Optical Transmitter. (6)

UNIT-IV

IX. (a) Explain the optical fibre directional coupler. (9)

(b) Distinguish between intermode and intramode dispersion. (6)

OR

X. (a) Explain Optical Time Domain Reflectometer (OTDR) method for the measurement of attenuation in optical fibre. (9)

(b) Write short note on (i) Fibre splicing. (ii) Optical circulators (6)

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