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Reg.No.....

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

OPTICAL FIBRE COMMUNICATION.

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

PART – A

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

I. (1). Define acceptance angle in optical fiber communication.

(2). List optical fibers based on refractive index profile.

(3). List two optical sources and two optical detectors.

(4). List the various types of optical amplifiers.

(5). List any four elements in optical fiber communication system. (3 x 2 = 6)

PART – B

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

II. (1). Explain the advantages of optic fiber.

(2). Explain the modulation of LED.

(3). Explain the working of optical receiver, with block diagram.

(4). Explain the cut back method of measurement of attenuation losses in optical transmission.

(5). Explain the need and working of optical isolator.

(6). Explain the basic concept of optical Amplifiers.

(7). Explain the structure and working principle of Avalanche photo diode. (4 x 6= 24)

PART – C

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

UNIT –I

III. (a). Derive the expression for numerical aperture in terms of core and cladding refractive indices. (8)

(b). Briefly explain the optical fiber modes and configurations. (7)

OR

IV. (a). Describe absorption, scattering and dispersion. (9)

(b). Briefly explain the meridional and Skew rays. (6)

UNIT-II

V. (a). Explain the structure of surface emitting and edge emitting LED (12)

(b). Explain the principle of Photo detection. (3)

OR

VI. (a).Briefly explain the stimulated emission and population inversion. (9)

(b). Explain the structure and working principle of PIN photo diode. (6)

UNIT-III

VII. (a).Explain the working principle and advantages of Erbium Doped Fiber Amplifier (EDFA) (9)

(b). Briefly explain the Wave length Division Multiplexing. (6)

OR

VIII.(a). Explain the basic optical communication system with block diagram. (10)

(b). Briefly explain the working principle of Raman amplifier. (5)

UNIT-IV

IX. (a).Describe different types of Fiber couplers. (8)

(b). Explain linear and non linear scattering losses in optical fiber transmission. (7)

OR

X. (a). Explain the Dispersion losses, intra and inter mode dispersion losses in optical transmission. (9)

(b). Describe the beam splitters optical modulators and optical circulators. (6)

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