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Reg. No……
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2021

OPTICAL INSTRUMENTATION

[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 dispersion.

2. Define acceptance angle of an optical fiber.

3. List the classification of LASER according to active medium.

4. Define diffraction.

5. List any two applications of Laser in military (3 x 2 = 6)

PART-B

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

II. 1. Write the differences between interference and diffraction.

2. List the advantages of fiber optic communication.

3. Explain the characteristics of laser beam.

4. Write the applications of lasers in medical field.

5. Write the conditions of occurrence of interference.

6. Explain the parts of optical fibers.

7. Explain the basic requirements of producing laser. (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 the formation of Newton's rings. (8)

(b) Explain the Brewster's law. (7)

OR

IV. (a) Explain Young's double slit experiment. (8)

(b) Explain the determination of the radius of curvature of plano convex lens form Newton's rings. (7)

UNIT – II

V. (a) Draw the block diagram of an optical fiber communication system and explain. (8)

(b) Explain the working of fiber optic pressure sensor. (7)

OR

VI. (a) Compare single mode and multi-mode optical fibers. (4)

(b) Explain numerical aperture of optical fiber with a neat sketch. (5)

(c) Explain the working of photo diode. (6)

UNIT- III

VII. (a) Explain the operation of semiconductor laser. (7)

(b) Explain the energy level diagram of ruby laser. (8)

OR

VIII. (a) Explain the construction and working CO_2 laser. (8)

(b) Explain the construction and working of dye laser. (7)

UNIT - IV

IX. (a) Explain the operation of Laser Doppler velocity meter. (7)

(b) Explain the construction of hologram. (8)

OR

X. (a) Explain about laser drilling. (7)

(b) Explain laser printing. (8)

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