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(Revision – 2015)

N22 – 08628

Reg. No……
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2022

OPTICAL INSTRUMENTATION

[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 laws of refraction.
2. Define polarization.
3. Explain spontaneous emission.
4. Define acceptance angle.
5. List the military applications of laser. (5 x 2 = 10)

PART-B

[Maximum Marks: **30**]

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

1. Explain about interference.
2. Explain the phenomenon of Dispersion.
3. List the advantages of fiber optic communication.
4. Explain the working of fiber optic displacement sensor.
5. State the characteristics of laser beam.
6. Explain the construction of semiconductor laser.
7. Describe the Scientific applications of Laser. (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 condition for bright and dark fringes in interference. (8)

(b) Explain the difference between Interference and Diffraction. (7)

OR

IV. (a) Explain the laws of Polarization. (8)

(b) Describe the formation of Newton's Rings. (7)

UNIT – II

V. (a) Explain with a block diagram, Fiber optic Communication System. (8)

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

OR

VI. (a) Describe the modes of operation of optical fibers. (8)

(b) Explain the working of photo diode. (7)

UNIT- III

VII. (a) Explain the construction and operation of Co2 Laser. (8)

(b) Describe the construction and operation of He-Ne Laser. (7)

OR

VIII. (a) Describe the construction and operation of Argon Laser. (10)

(b) Explain the basic requirements of producing LASER. (5)

UNIT - IV

IX. (a) Explain laser based displacement measuring. (8)

(b) Describe the Industrial Applications of Laser. (7)

OR

X. (a) Explain the Medical Applications of Laser. (8)

(b) Explain laser Doppler velocity meter. (7)

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