

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, APRIL-2022**

OPTICAL INSTRUMENTATION

[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 reflection.
2. Describe the principle of operation of LED.
3. Describe the population Inversion.
4. What is a Hologram?
5. Mention any two characteristics 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. Describe the phenomenon of Diffraction.
2. Listout any 6 advantages of fibre optic communication.
3. Describe the population Inversion with the help of an example.
4. Describe the working of Laser Doppler Velocity meter.
5. Explain the phenomenon and laws of reflection.
6. Describe the working of fibre optic displacement sensor.
7. Explain 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. Explain Polarisation and laws of polarisation.

(15)

OR

- IV.(a) Explain the formation of Newton's ring with the help of a diagram. (8)
(b) Explain the phenomenon Refraction and laws of refraction. (7)

UNIT-II

- V. (a) Explain with a block diagram, Fibre optic Communication System. (10)
(b) List out the differences between Step index and Graded index fibre. (5)

OR

- VI. (a) Describe the working of photo diode. (8)
(b) Explain the working of fibre optic Force sensor. (7)

UNIT-III

- VII. Describe absorption, spontaneous emission and stimulated emission. (15)

OR

- VIII.(a) Describe the construction and operation of Ruby Laser. (8)
(b) Describe the construction and operation of He-Ne Laser. (7)

UNIT-IV

- IX. (a) Describe the Industrial Applications of Laser. (8)
(b) Describe the military Applications of Laser. (7)

OR

- X. Explain the construction and reconstruction of image in a hologram? (15)
