

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2018

BIOPHOTONICS

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Define Laser.
2. Give the classification of Laser.
3. List any four clinical applications of Flow cytometry.
4. Name the lasers used in ophthalmology.
5. List any four Laser safety methods.

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

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

1. Differentiate between spontaneous emission and stimulated emission.
2. Write a note on mode locking and List its types.
3. Explain the construction of Laser with a schematic.
4. Illustrate the construction of Nd-YAG Laser.
5. Explain with an example In vivo imaging and tissue imaging.
6. Write a note on the general scheme of biosensing.
7. Explain how photodynamic therapy is used to treat cancer.

(5 × 6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

- III (a) Give an account on the optical properties of the living tissue. 8
 (b) Differentiate between 3-level and 4-level Laser. 7

OR

- IV (a) Explain the need of population inversion in Laser with suitable diagram. 7
 (b) Write a note on the Laser induced change in tissue characteristics. 8

UNIT — II

- V (a) Describe the working of He-Ne Laser with neat sketch. 9
 (b) Give an account on the disadvantages of Argon Laser. 6

OR

- VI (a) Explain with neat sketch in the construction of CO₂ Laser. 10
 (b) Illustrate the construction of Argon Laser. 5

UNIT — III

- VII (a) Summarize the principle and working of Flow cytometry. 10
 (b) Explain the principle of optical biosensor. 5

OR

- VIII (a) Explain the optical coherence tomography. 8
 (b) Write a note on bio imaging, also give examples. 7

UNIT — IV

- IX (a) Give an account on the dermatological applications of Laser. 8
 (b) Explain Laser welding. 7

OR

- X (a) Explain photo sensitizers and their use in medical field. 8
 (b) Summarize the mechanism of photodynamic action. 7