TED (15) – 6245
(REVISION — 2015)

Reg. No.....
Signature .....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 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 population inversion.
2. Mention any two pumping process in laser system.
3. State stimulated emission.
4. Define flow cytometry.
5. Give the uses of photosensitizers. (5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Differentiate between temporal coherence and spatial coherence.
2. Write a note on bioimaging.
3. Explain optical biosensors.
4. Give an account on lasers in ophthalmology.
5. List and explain properties of lasers.
6. Describe the holographic principle.
7. Explain with a sketch the working of Helium-Neon lasers. (5×6 = 30)

[P.T.O.

[228]

PART — C

(Maximum marks : 60)

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

UNIT — I

III (a) Explain thermal effect of laser beam on tissues.

(b) Write a note on

(i) Photothermal ablation (ii) Photo disruption (2×

OR

IV (a) Explain the optical properties of living tissues.

(b) Illustrate and explain laser construction.

UNIT — II

V (a) Explain with diagram construction and operation of Nd:YAG laser.

(b) Explain the role of active medium and optical resonator in laser system.

OR

VI (a) Summarise the construction and operation of CO_2 laser.

(b) Explain the applications of CO_2 lasers.

UNIT — III

VII (a) Explain the principle and operation of flow cytometry.

(b) Discuss on cellular imaging.

OR

VIII (a) Describe the procedures involved in optical coherence tomography.

(b) Write a note on tissue imaging.

UNIT — IV

IX (a) Describe the procedures of laser tissue welding.

(b) Write a note on photodynamic therapy.

OR

X (a) Describe laser applications in dermatology.

(b) Explain lasers for surgical applications.

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