TED (10) – 1016 A

(REVISION — 2010)

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

APPLIED SCIENCE - II (Physics)

[*Time* : 1½ hours

(Maximum marks : 50)

Marks

PART — A

(Maximum marks : 4)

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

I (a) Why liquid drops and bubbles appear spherical in shape ?

(b) Draw the symbol of NOR gate.

(2×2 = 4)

PART — B

(Maximum marks : 16)

(Answer any *two full* questions. Each question carries 8 marks.)

II (a) What is a couple ? Derive the formula for the work done by a couple.   4

(b) State continuity equation for a fluid in flow. The radius of a water pipe decreases from 4cm to 2 cm. If the velocity of water in the wider portion is 2m/s, calculate the velocity in the narrow portion.   4

III (a) Explain an experiment to determine coefficient of viscosity of a highly viscous liquid.   4

(b) Define surface tension. Show that surface tension is numerically equal to surface energy.   4

IV (a) Explain total internal reflection. Describe an optical fiber. How light is transmitted in an optical fiber ?   4

(b) What are the characteristics that made the LASER light different from ordinary light ? List any four applications of laser.   4

[203]

[P.T.O.

Marks

PART — C

(Maximum marks : 30)

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

Unit — I

V   (a)   Define moment of force about a point. State the conditions of equilibrium of a body under the action of co-planar parallel forces.   3

    (b)   With a neat diagram, explain the working of an atomizer.   3

    (c)   Discuss the variation of viscosity of liquid and gas with temperature.   3

    (d)   State parallelogram law of forces. Derive an expression for the magnitude and direction of the resultant of two forces using parallelogram law of forces.   6

Or

VI   (a)   Explain the factors that affect the surface tension of a liquid.   3

    (b)   Distinguish between free vibration and forced vibration. What is resonance ?   3

    (c)   Derive the relation between velocity, wavelength and frequency of a wave.   3

    (d)   Explain a method to produce ultrasonic sound and give four applications of it.   6

Unit — II

VII   (a)   Why during sunset and sun rise sun appears red in colour ?   3

    (b)   A concave lens made of a transparent material has a refractive index 1.5. Find its focal length, if the radii of curvature are 10 cm and 30 cm.   3

    (c)   Give the formula for the force experienced by a conductor carrying a current when it is placed in uniform magnetic field. At what conditions the force on a current carrying conductor placed in a magnetic field is minimum ?   3

    (d)   State Kirchhoff's laws. Using these laws derive the balancing condition of a Wheatstone's bridge.   6

Or

VIII   (a)   Draw the symbol and write the truth table of XOR gate.   3

    (b)   Distinguish between spontaneous emission and stimulated emission.   3

    (c)   Explain the working and use of a photoelectric cell.   3

    (d)   State the laws of photoelectric emission. The threshold wavelength for photoelectric emission in a metal is 600nm. Find the maximum Kinetic energy of the electrons emitted when it is exposed to the radiation of wavelength 200nm.   6