

SECOND SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY—OCTOBER, 2014

APPLIED SCIENCE—II (PHYSICS)

(Common except for DCP and CABM)

[Time : 1½ hours

(Maximum marks : 50)

PART—A

(Maximum marks : 4)

Marks

I Answer the following questions in one or two sentences. Each question carries 2 marks.

- (a) Name the different forms of energy associated with a flowing liquid.
(b) How is critical angle related to refractive index? (2×2=4)

PART—B

(Maximum marks : 16)

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

- II (a) Define the moment of a force about a point. State the conditions of equilibrium of a body under the action of coplanar parallel forces. 4
(b) Describe Poiseuille's method to determine the co-efficient of viscosity of a liquid. 4
- III (a) Define the simple harmonic motion. Write down the differential equation of a simple harmonic motion and explain the various terms. 4
(b) How will you convert galvanometer into a voltmeter? 4
- IV (a) Which two gates are recognised as Universal gates? Why? Draw their logical symbol and explain the truth table of both. 4
(b) Threshold wavelength for Sodium is 540 nm. Calculate the photoelectric work function. 4

PART—C

(Maximum marks : 30)

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

UNIT—I

- V (a) State and explain Lami's Theorem. 3
(b) Discuss the working principle of aerofoil. 3
(c) Distinguish between transverse and longitudinal waves. 3
(d) Define co-efficient of viscosity. A raindrop of radius 0.2 mm falls through air. If the viscosity of air is $1.8 \times 10^{-5} \text{ kg m}^{-1}\text{s}^{-1}$, find the viscous force acting on the drop when its speed is 1 m/s. 6

OR

	Marks
VI (a) Explain Bernoulli's Theorem.	3
(b) Explain the magnetostriction method to produce ultrasonic waves.	3
(c) The audible frequency range of a human ear is 20Hz to 20 kHz. Convert this to the corresponding wavelength range. Speed of sound in air is 340 m/s.	3
(d) State parallelogram law of forces. Explain the analytical method to find the resultant of two forces.	6

UNIT—II

VII (a) What is an XOR gate? Draw its logic symbol and truth table.	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) State Einstein's photoelectric equation. What are the laws of photoelectric effect?	3
(d) Explain the construction and working of a moving coil galvanometer.	6

OR

VIII (a) Distinguish between spontaneous emission and stimulated emission.	3
(b) A circular coil of 40 turns of wire and negligible section has diameter 32 cm. What current must exist in the coil to produce a flux density of 3×10^{-4} T at its centre?	3
(c) What is meant by a photoelectric cell? Write any three applications of photoelectric effect.	3
(d) With the help of a diagram, explain the principle of a simple microscope. Write the formula for magnification and explain the various terms used.	6