

**SECOND SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY — OCTOBER, 2016**

APPLIED SCIENCE – II (Physics)

(Common to all except DCP and CABM)

[Time : 1½ hours

(Maximum marks : 50)

PART — A

(Maximum marks : 4)

Marks

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

- (a) Distinguish between vectors and scalars.
(b) What is a shunt ? What is its use in ammeter ?

(2×2 =)

PART — B

(Maximum marks : 16)

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

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|---------|--|---|
| II (a) | Explain Poiseuille's method to determine the coefficient of viscosity of water. | 4 |
| (b) | Amplitude, frequency and initial phase of a simple harmonic wave are 0.8cm, 0.25Hz and $\pi/6$ radian respectively. Obtain the expression for SHM. | 4 |
| III (a) | A convex lens made of glass of refractive index 1.5 has a focal length 12cm. If one of its radius of curvature is 10cm, find the other radius. | 4 |
| (b) | With the help of a diagram explain the working of Ruby laser. | 4 |
| IV (a) | State Bernoulli's principle and explain the working of an atomizer. | 4 |
| (b) | A conductor 2cm long carrying a current 8A lies at right angles to a magnetic field of intensity 1 tesla. Calculate force on the conductor. | 4 |

PART — C

(Maximum marks : 30)

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

UNIT — I

- | | | |
|-------|---|---|
| V (a) | Write the conditions for equilibrium of a body under the action of a number of coplanar parallel forces. | 3 |
| (b) | Find out the wavelength of ultrasonic wave of frequency 50 kHz in air, if it is propagated through air with velocity 330 m/s. | 3 |

- (c) Discuss the variation of viscosity with temperature. 3
- (d) Derive an expression for the work done by a couple and hence deduce the equation of power. 6

OR

- VI (a) Distinguish between free vibration, forced vibration and resonance. 3
- (b) Two forces 3N each act at a point at an angle 90° . A third force acts equally inclined to them keeping the system in equilibrium. Find its value. 3
- (c) State and explain Lami's theorem. 3
- (d) A liquid drop of radius 1cm is sprayed into 10^6 droplets of equal size. Calculate the energy needed for this process. (S.T. of the liquid : $35 \times 10^{-3}\text{N/m}$) 6

UNIT – II

- VII (a) Explain the terms critical angle and total internal reflection. Write a practical application of total internal reflection. 3
- (b) A circular coil has 50 turns and 5cm radius. Determine the magnetic field intensity at the centre when 2A current flows through it. 3
- (c) Write three applications of photoelectric effect. 3
- (d) Describe the construction, principle and working of a moving coil galvanometer. 6

OR

- VIII (a) With the help of a neat diagram, explain the principle of a simple microscope. 3
- (b) State and explain Biot – Savart law. 3
- (c) Identify the logic gate whose outputs are high only when the two inputs are different. Draw its symbol and write the truth table. 3
- (d) Write Einstein's photoelectric equation and explain the terms. The threshold wavelength for photoelectric emission in a metal is 600nm. What is the maximum velocity of the ejected electrons when it is irradiated with light of wavelength 200nm? 6
- (Planck constant : $6.63 \times 10^{-34}\text{Js}$, mass of electron : $9.1 \times 10^{-31}\text{kg}$, velocity of light : $3 \times 10^8\text{m/s}$)