TED (10) – 1016 A

(REVISION — 2010)

Reg. No. .....

Signature .....

SECOND SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/ TECHNOLOGY— MARCH, 2015

APPLIED SCIENCE – II (PHYSICS)

(Common except 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.

1. Define coefficient of viscosity. Give its dimensional formula.
2. State Snell's Law of refraction. (2×2=4)

PART—B

(Maximum marks : 16)

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

II (a) Two forces acting at right angle gives a resultant force of 10N. If one of the force is 8N, find the magnitude of the other force.

(b) With the help of a neat diagram, explain the working of an atomiser.

III (a) Discuss any four applications of ultrasonic waves.

(b) Write down the two conditions to be satisfied for total internal reflection and deduce the relation between critical angle and refractive index.

IV (a) A galvanometer of resistance 50 ohms gives full scale deflection for 5 mA. How can it be converted to a voltmeter to read upto 10V ?

(b) Explain the laws of photoelectric effect.

(2×8=16)

Marks

PART—C

(Maximum marks : 30)

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

UNIT—I

V (a) Define the terms resultant and equilibrant. 3

(b) When hair brush is taken out of water, spread out hair come close together. Why ? 3

(c) Write the conditions for equilibrium of a body under the action of a number of coplanar parallel forces. 3

(d) Define wavelength, wave velocity and frequency of a wave. Derive the relation connecting wave velocity, wavelength and frequency. 6

OR

VI (a) Explain the Pouiselli's method to determine the coefficient of viscosity of water using capillary flow. 3

(b) The radius of a pipe of non-uniform cross-section varies from 6cm to 2cm. If the speed of fluid flow at the wider portion is 2m/s, find its speed at the narrow portion. 3

(c) A liquid drop of radius 1cm is sprayed into 10^3 droplets of equal size. Calculate the energy needed for this process if the surface tension of the liquid is 0.035N/m. 3

(d) Derive the expression for work done by a couple and hence deduce the equation for power. 6

UNIT—II

VII (a) Explain the blue colour of sky. 3

(b) Draw the logic symbol and give the truth table of OR gate. 3

(c) What is the essential condition for lasing action ? 3

(d) Applying Kirchhoff's laws, obtain the balancing condition of Wheatstone's bridge. 6

OR

VIII (a) Give the formula for the force experienced by a conductor carrying current when it is placed in a uniform magnetic field. Name an instrument which uses this as the working principle. 3

(b) What are the main characteristics of Laser radiation ? 3

(c) The threshold wavelength for photoelectric emission in a metal is 400nm. Find the maximum kinetic energy of the electrons emitted when it is exposed to a radiation of wavelength 200nm. 3

(d) Write down the expression for the magnetic field due to a current carrying circular coil at a point on the axial line. Hence deduce the expression for the magnetic field at the centre. Find the magnetic field at the centre of the circular coil of radius 2cm and carrying a current of 2A. 6

Numerical Values of constants : Planck's Constant, $h = 6.63 \times 10^{-34}$ Js. : Velocity of light, $c = 3 \times 10^8$m/s.