TED (10)–1016 A

Reg. No. .....

(REVISION—2010)

Signature .....

SECOND SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/ TECHNOLOGY—MARCH, 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) Define the parallelogram law of forces.

(b) Write down the output of AND, NAND, NOR and XOR gates when both inputs are high. (i.e. 1). (2×2=4)

PART—B

(Maximum marks : 16)

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

II (a) With a neat diagram, explain the working of an atomiser. 4

(b) Prove that the intrinsic surface energy of a liquid is numerically equal to surface tension. 4

III (a) Explain total internal reflection. What are the conditions to be satisfied for a light to suffer total internal reflection ? 4

(b) A galvanometer of resistance 100 Ω gives full scale deflection for 1 mA. Calculate the shunt resistance needed to constrict an ammeter of range 100 A. 4

IV (a) Explain the principle of laser action. What are the characteristics that made the LASER light different from ordinary light ? 4

(b) Discuss the variation of viscosity with temperature. 4

PART—C

(Maximum marks : 30)

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

UNIT—I

V (a) A body is acted upon by two forces 3 N and 10 N. The angle between the forces is 60^{θ} . Find out the magnitude and direction of the force to be applied to keep the body in equilibrium. 3

(b) Describe stoke's method to calculate the viscosity of a highly viscous liquid. 3

Marks

(c) The surface tension of a soap solution is 30×10^{-3} N/m. How much work is done to increase the radius of a soap bubble from 1.5 cm to 3 cm ? 3

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

OR

VI (a) Explain the equation of continuity in the case of a fluid flowing through a pipe of varying cross-section. 3

(b) Explain the term angle of contact. How does it depend on the capillary height ? 3

(c) A bat emits ultrasonics of frequency 1000 kHz in air. If the sound meets the water surface, what is the wavelength of the reflected sound ? Speed of sound in air is 340 m/s. 3

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

UNIT—II

VII (a) A convex lens made of glass of refractive index 1.5 has a focal length 12 cm. If one of its radii of curvature is 10 cm, find the other radius. 3

(b) State and explain Biot-Savart Law. 3

(c) Mention any three applications of laser. 3

(d) Using kirchoff's laws, derive the balancing condition of a wheatstone's bridge. 6

OR

VIII (a) State Fleming's left hand rule. Write down the expression for the force on a current carrying conductor placed in a magnetic field. 3

(b) The threshold wavelength for photoelectric emission in a metal is 600 nm. Find the maximum Kinetic energy of the electrons emitted when it is exposed to the radiation of wavelength 200 nm. 3

(c) Explain the lens maker's formula for double convex and concave lens. 3

(d) With the help of a neat diagram, explain the working of a Ruby laser. 6
