

TED (10) - 1016 A

(REVISION - 2010)

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

## APPLIED SCIENCE - II (Physics)

[Time : 11/2 hours

(Maximum marks : 50)

## PART - A

### (Maximum marks : 4)

Marks

 $(2 \times 2 = 4)$ 

4

4

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4

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.

#### 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.
  - (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.
- III (a) Explain an experiment to determine coefficient of viscosity of a highly viscous liquid.
  - (b) Define surface tension. Show that surface tension is numerically equal to surface energy.
- IV (a) Explain total internal reflection. Describe an optical fiber. How light is transmitted in an optical fiber ?
  - (b) What are the characteristics that made the LASER light different from ordinary light? List any four applications of laser.

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[P.T.O.



## 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   |   |
| IV  | (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  |   |
| 711 | (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<br>when it is placed in uniform magnetic field. At what conditions the force on a<br>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   |   |
| III | (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 |

Marks