

TED (10)–1003 A

(REVISION—2010)

Reg. No. ....

Signature .....

FIRST SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY  
OCTOBER, 2012

APPLIED SCIENCE–I (Physics)  
(Common—except DCP and CABM)

[Time : 1½ hours

(Maximum marks : 50)

PART—A

(Answer the following questions in one or two sentences.  
Each questions carries 2 marks)

- |   | Marks |
|---|-------|
| I (a) What are giga and femto ?                                   | 2     |
| (b) Define rotational kinetic energy. Give the expression for it. | 2     |

PART—B

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

- |  |   |
|--|---|
| II (a) Obtain the expression for range of a projectile and deduce the condition for maximum range.                                       | 4 |
| (b) Explain why the outer end of road is laid at a higher level than the inner on the curved portion of the road.                        | 4 |
| III (a) Define impulse of a force and show that it is equal to change in momentum.   | 4 |
| (b) Define parallel and perpendicular axes theorem.  | 4 |
| IV (a) Obtain an expression for the moment of inertia of a disc about an axis passing through the centre and perpendicular to its plane. | 4 |
| (b) State Hooke's law. Deduce the expression for bulk modulus.   | 4 |

PART—C

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

UNIT—I

- |   |   |
|---|---|
| V (a) Explain the recoil velocity of a gun.   | 3 |
| (b) When a body is thrown up, show that time of ascent is equal to time of descent.   | 6 |
| (c) A body travels 100 m during 4 <sup>th</sup> second and 150 m during the 9 <sup>th</sup> second of its motion. Find the distance travelled by the body during the 11 <sup>th</sup> second of its motion. | 6 |

OR

	Marks
VI (a) Write the advantages of SI system over the other system of units.	3
(b) Derive the expression for the period of a simple pendulum.	6
(c) A stone of mass 900 gm tied at the end of string is whirled round horizontally in a circle of radius 2 m, with a speed of 120 rev/min. Calculate the centripetal acceleration and force.	6

## UNIT—II

VII (a) Define radius of gyration.	3
(b) A circular disc of mass 0.5 kg and radius 0.1 m is rotating about a tangent in its plane. If it makes 5 rotations/min, calculate its rotational kinetic energy.	6
(c) Derive the equation for time period of a satellite.	6

OR

VIII (a) Explain geostationary satellite.	3
(b) State Newton's Universal Law of Gravitation. Derive the expression for orbital velocity of a satellite.	6
(c) A 10 kg weight is attached to one end of a copper wire 4 m long and diameter 2 mm. Find the extension produced if young's modulus of wire is equal to $1.25 \times 10^{11} \text{ N/m}^2$ .	6

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