

TED (10)–1003A

Reg. No.

(REVISION—2010)

Signature

FIRST SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY—MARCH, 2012

APPLIED SCIENCE–I (PHYSICS)
(Common except DCP and CABM)

[Time : 1½ hours

(Maximum marks : 50)

	Marks
PART—A	
(Answer the questions in one or two sentences. Each question carries 2 marks.)	
I 1. Define a newton. Write the dimensional formula for force.	2
2. How do you account for the lack of atmosphere on the moon ?	2
PART—B	
(Answer any two full questions. Each question carries 8 marks.)	
II 1. Derive an expression for the period of a simple pendulum using dimensional analysis.	4
2. State Newton's Law of Gravitation. Distinguish between 'g' and 'G'.	4
III 1. State the law of conservation of momentum. Prove it in the case of collision of two bodies moving in the same direction.	4
2. Explain Hooke's Law. Formulate the three elastic moduli.	4
IV 1. Define angular displacement and angular velocity. Derive the relation between linear velocity and angular velocity.	4
2. Derive an expression for the kinetic energy of a rolling disc.	4
	(2×8=16)

PART—C

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

UNIT—I

- | | |
|--|---|
| V 1. State Newton's second law of motion and derive the relation for force. | 3 |
| 2. The ceiling of a long hall is 25 m high. What is the maximum horizontal distance that a ball thrown with a speed of 40 m/s can go without hitting the ceiling of the hall ? | 6 |
| 3. A gun weighing 10 kg fires a bullet of 30 g with a velocity of 330 m/s. With what velocity does the gun recoil ? | 6 |

OR

	Marks
VI 1. Explain friction. Why is it called a necessary evil ?	3
2. One end of a string of length 74.2 cm is attached to a bucket containing water and the bucket is rotated in a vertical circle. Find the maximum speed with which it can be rotated without spilling water at the highest point. How many revolutions per minute does it make ?	6
3. A body moving with uniform acceleration describes 10 m in the 2 nd second and 20 m in the 4 th second of its motion. Calculate the distance moved by it in the 5 th second of its motion.	6

UNIT—II

VII 1. Distinguish between torque and angular momentum. Give the relation between them.	3
2. A uniform circular disc of mass 2 kg and radius 0.5 m is rotated about an axis passing through its centre and perpendicular to its plane. Find its moment of inertia about this axis and also about one of its diameters.	6
3. What is geostationary orbit ? Determine its height from the earth. ($g = 9.8 \text{ m/s}^2$, $R = 6400 \text{ km}$)	6

OR

VIII 1. If the ice on the polar caps of the earth melts, how will it effect the duration of the day ?	3
2. On taking a solid ball of rubber from the surface to the bottom of a lake 200 m deep, the reduction in volume of the ball is 0.1%. The density of water is $1 \times 10^3 \text{ kg/m}^3$. Determine the value of bulk modulus of rubber. ($g = 10 \text{ ms}^{-2}$).	6
3. If a satellite is moving around the earth in a circular orbit, derive the formula for the orbital velocity and period of revolution of the satellite.	6