



Techno ACE

Model Question Paper

Physics

Class: XI going to XII

Time: 22.5 mints

Marks: 60

SECTION I

This section contains 2 (Two) Questions

8

- The answer to each question is a SINGLE DIGIT INTEGER ranging from 0 to 9, that you have to choose the correct one (ONLY ONE) from options given.
- Correct answer : + 4, No answer : 0 and Incorrect answer : - 1

1. The radius of gyration of a disc is k and its radius is R . The ratio of $R^2 : k^2 =$

- (A) 7 (B) 5
(C) 2 (D) 1

2. The ratio of RMS speed of a Hydrogen molecule to that of a Oxygen molecule, both at temperature 27°C

- (A) 4 (B) 8
(C) 2 (D) 1

SECTION II

This section contains 3 (Three) Questions

12

- Each question has 4 (Four) options : A, B, C and D. One or more than one of these four option(s) is(are) correct answer(s).
- Correct answer : + 4, No answer : 0 and Incorrect answer : - 1

3. A projectile is thrown from ground with a velocity 10 ms^{-1} . Its horizontal range would be maximum when thrown at an angle of projection with horizontal is

- (A) 45° (B) 30°
 (C) 60° (D) 37°

4. The internal energy of an isolated thermodynamic system containing an ideal gas does not depend on a change in
 (A) pressure (B) volume
 (C) temperature (D) atomicity
5. Doppler effect is a phenomenon exhibited by
 (A) shock waves (B) sound waves
 (C) light waves (D) seismic waves

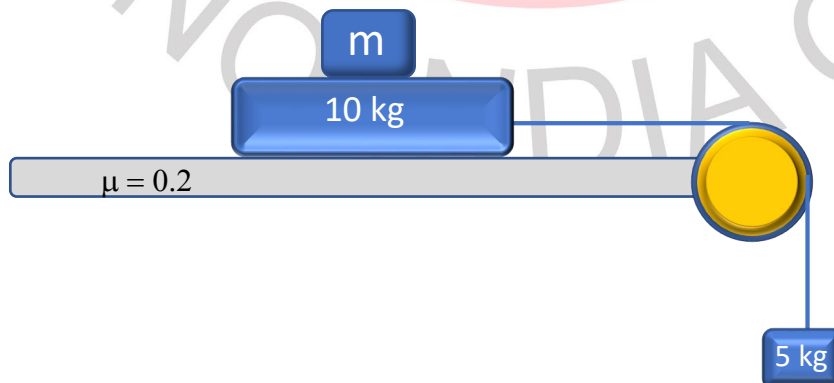
SECTION III

This section contains **10 (Ten)** Questions

40

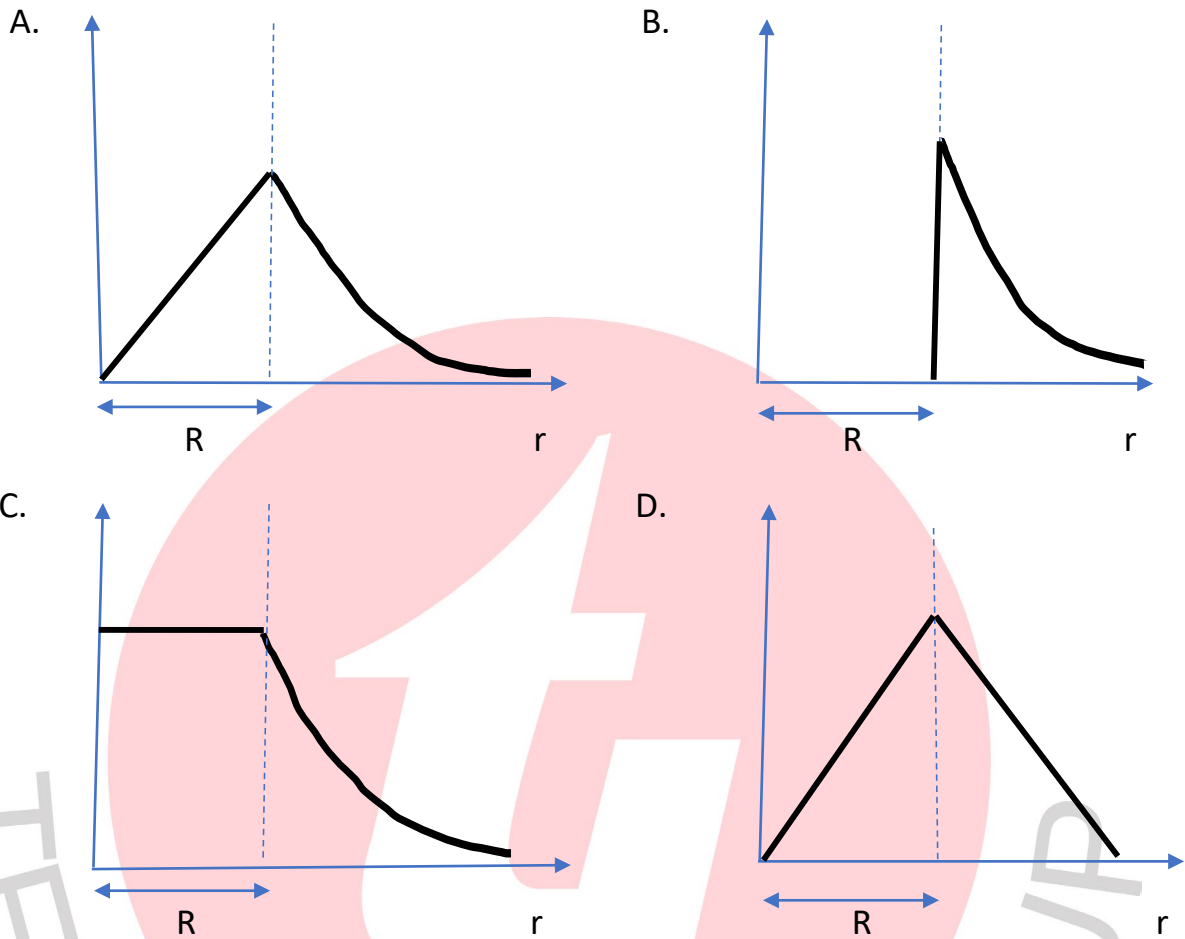
- Each question has **4 (Four)** options : A, B, C and D. **One** of these four options is correct answer.
- Correct answer : **+ 4**, No answer : **0** and Incorrect answer : **- 1**

6. The distance covered by a body moving in a straight line along X-axis is given by $x^2 = t^2 + 2t + 3$. If its acceleration is given to vary as x^n , the value of $n =$
 (A) 2 (B) -2
 (C) 3 (D) -3
7. The minimum value of m in the system given, so that it remains in equilibrium will be



- (A) 15 kg (B) 20 kg
 (C) 10 kg (D) 5 kg

8. A spring of spring constant k is cut into 3:2 as per length. The spring constant of the longer part is
- (A) $\frac{5k}{3}$ (B) $\frac{3k}{5}$
(C) $\frac{3k}{2}$ (D) $\frac{2k}{3}$
9. The transverse displacement of a string (clamped at both ends) is given by $y(x,t) = 0.06 \cos \frac{2\pi}{3}x \sin 120\pi t$ where x and y are in meters and t is in seconds. The length of the string is 1.5m and its mass is 3×10^{-2} kg. The tension in the string is
- (A) 328 N (B) 468 N
(C) 648 N (D) 576 N
10. A wire of length L and radius r is clamped rigidly at one end. When the other end of the wire is pulled by a force of F , its length increases by l . Another wire of same material of length $2L$ and radius $2r$ is pulled by a force $2F$. The increase in the length of the wire is
- (A) $2l$ (B) $4l$
(C) l (D) $l/2$
11. The excess pressure inside the drop of a mercury of radius 3 mm is [surface tension of mercury is 0.465 Nm^{-1} and atmospheric pressure is $1.014 \times 10^5 \text{ Pa}$]
- (A) 400 Pa (B) 310 Pa
(C) 280 Pa (D) 430 Pa
12. A particle executes simple harmonic motion with an amplitude a . The period of oscillation is T . The minimum time taken by the particle to travel half of the amplitude from equilibrium position is
- (A) $T/8$ (B) $T/12$
(C) $T/2$ (D) $T/4$
13. Which one of the following plots represents the variation of gravitational field on a particle with distance r due to thin spherical shell [r is measured from centre of the shell]



14. Two particles having mass M and m are moving in a circular path having radius R and r . If their time period are same then the ratio of angular speeds will be

- (A) $\frac{r}{R}$
- (B) $\frac{R}{r}$
- (C) 1
- (D) $\sqrt{\frac{R}{r}}$

15. Match the accelerations (II) of the round bodies (I) rolling down an inclined plane of angle θ , given in two columns:

COLUMN I		COLUMN II	
A	RING	P	$\frac{2}{3} g \sin \theta$
B	DISC	Q	$\frac{1}{2} g \sin \theta$
C	SPHERICAL SHELL	R	$\frac{5}{7} g \sin \theta$
D	SOLID SPHERE	S	$\frac{3}{5} g \sin \theta$
		T	$\frac{1}{3} g \sin \theta$

Correct Answer:

(A) A-Q, B-P, C-S, D-R

(B) A-T, B-S, C-R, D-Q

(C) A-Q, B-P, C-T, D-S

(D) A-P, B-Q, C-T, D-S

