

## FlexiPrep

### CBSE Class 11 – Physics: Laws of Motion and Friction Assignment 1 (For CBSE, ICSE, IAS, NET, NRA 2022)

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#### Question 1:

(i) A body of mass  $m$  moves along the positive  $x$  – axis , it starts at velocity  $v_0$  at  $t = 0$  and it is the origin initially. It is acted by the force such that

$F = -kv$  find the time in which it will come to rest

- (a)  $t \rightarrow \infty$
- (b)  $t = kt/m$
- (c)  $t = mt/k$
- (d) None of the above

(ii) Find the velocity of body as a function of time

- (a)  $v_0 \exp\left(-\frac{kt}{m}\right)$
- (b)  $v_0 \exp\left(-\frac{mt}{k}\right)$
- (c)  $v_0 \exp(-t)$
- (d) None of the above

(iii) Find the value of  $x$  at which its velocity become 0

- (a)  $\frac{mv_0}{k}$
- (b)  $\frac{mv_0}{k^2}$
- (c)  $\frac{m}{kv_0}$
- (d) None of the above

#### Question 2: Matrix match type-

A boy of weight  $W$  is standing in an elevator. Find the force of the boy feel

Column A		Column 2	
(a)	When the elevator stands still	(P)	$F = W$

(b)	When the elevator moving with constant velocity ( $v\text{ m/s}$ ) downward	(Q)	$F > W$
(c)	When the elevator moving with constant velocity ( $v\text{ m/s}$ ) upward	(R)	$F < W$
(d)	Moving up with acceleration $\left(a \frac{m}{s^2}\right)$	(S)	No appropriate match
(e)	Moving down with acceleration $\left(a \frac{m}{s^2}\right)$		
<i>A Boy of Weight <math>W</math> is Standing in an Elevator. Find the Force of the Boy Feel</i>			

**Question 3:**

(i) . A 6 kg object is subject to three forces

$$F_1 = 20i + 30j\text{N}$$

$$F_2 = 8i - 50j\text{ N}$$

$$F_3 = 2i + 2j\text{N}$$

Find the acceleration of object

(a)  $5i + 3j$

(b)  $5i - 3j$

(c)  $3i + 5j$

(d)  $3i - 5j$

(ii) Which of the following expression is correct if at  $t = 0$  , object is at origin and velocity is  $v_0 = i + j$

(a)  $r = i (2.5 t^2 + t) + j (t - 1.5t^2)$

(b)  $r = i (2.5 t^2 - t) + j (t + 1.5t^2)$

(c)  $r = it - jt^2$

(d) None of the above

**Question 4:**

A particle of weight  $W$  resting a smooth (frictional less) inclined plain  $AB$  with the help of force  $F$  acting on the particle at angle  $\theta$  with the line  $AB$ . Find the force  $F$  and normal reaction

(a)  $(W \cos \theta) / \sin \alpha, [W \cos (\alpha - \theta)] / \cos \theta$

(b)  $(W \sin \alpha) / \cos \theta, [W \cos (\alpha - \theta)] / \cos \theta$

(c)  $(W \sin \theta) / \cos \theta, [W \sin (\alpha - \theta)] / \cos \theta$

(d) None of the above

**Question 5:****Match the Column**

Column A		Column A	
(a)	$S_1$	(P)	$\Sigma F \neq 0$
(b)	$S_2$	(Q)	$\Sigma F = 0$
(c)	$S_3$	(R)	$a = 0$
(d)	$S_4$	(S)	$a \neq 0$
<i>Match the Column</i>			

**Question 6:**

A boy pushes a mass with a force  $F$ . Coefficient of friction between body and floor is  $\mu_m$  and between boy shoe and floor is  $\mu_B$ . There mass is  $M$  (block) and  $m$  (boy) respectively.

(i) What maximum force boy can apply without slipping

(a)  $\mu_m mg$

(b)  $\mu_m Mg$

(c)  $\mu_B mg$

(d) None of the above

(ii) What is the condition required to move the block without slipping

(a)  $\mu_B / \mu_m > M / m$

(b)  $\mu_B / \mu_m > m / M$

(c)  $\mu_B / \mu_m < M / m$

(d)  $\mu_B / \mu_m < m / M$

**Answers:****Question 1:**

(i) = (a)

(ii) = (a)

(iii) = (a)

(iv) = (b)

**Question 2:**

(a) = (P)

(b) = (P)

(c) = (P)

(d) = (Q)

(e) = (R)

**Question 3:**

(i) = (b)

(ii) = (a)

**Question 4:** (b)**Question 5:**

(a)  $\rightarrow$  (Q), (R)

(b)  $\rightarrow$  (Q), (R)

(c)  $\rightarrow$  (Q), (S)

(d)  $\rightarrow$  (Q), (R)

**Question 6:**

(i) = (c)

(ii) = (a)

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