

R A M
2 0 2 3
THEORY



(RECALL ALL MEMORY)

18

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය , 2023 අගෝස්තු
கல்விப் பொதுத் தராதரப் பத்திர(உயர் தர)ப் பரீட்சை, 2023 ஓகஸ்ட்
General Certificate of Education (Adv. Level) Examination, August 2023

භෞතික විද්‍යාව I
பௌதிகவியல் I
Physics I

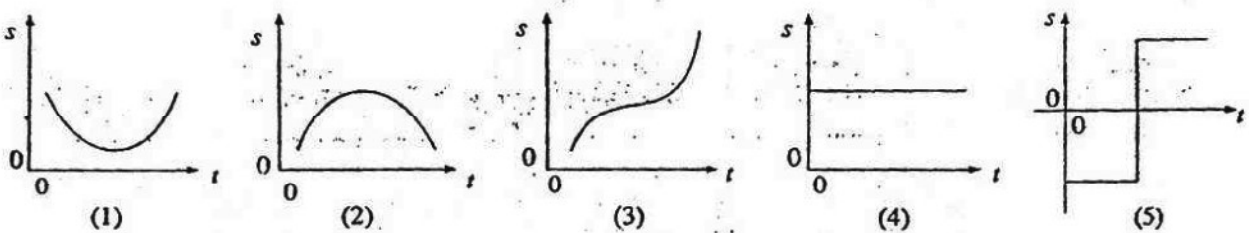
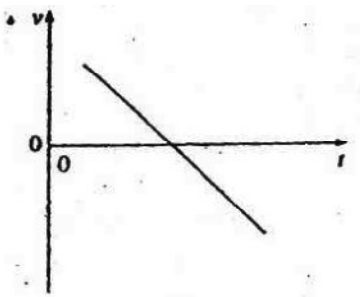
Multiple Choice Questions

1. Consider the following statements made regarding the action force and the reaction force.
(A) They are equal in magnitude.
(B) They act on the same object.
(C) They are opposite in direction to each other.

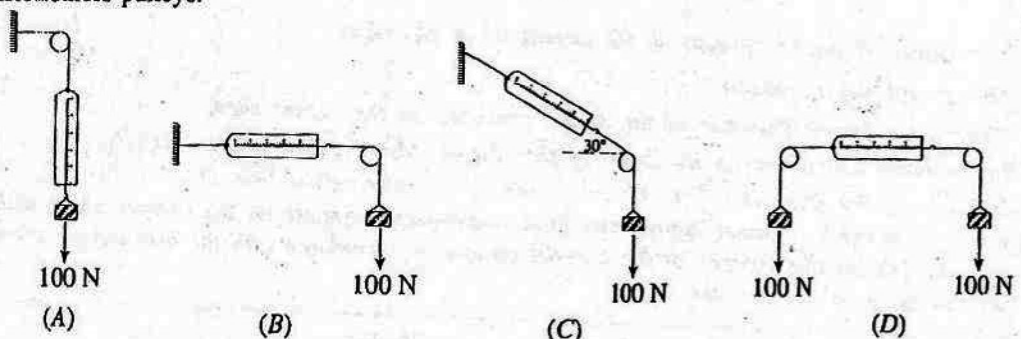
Of the above statements,

- (1) only (A) is true.
- (2) only (A) and (B) are true.
- (3) only (A) and (C) are true.
- (4) only (B) and (C) are true.
- (5) All (A), (B) and (C) are true.

2. The graph shown in the figure represents the velocity (v) - time (t) curve for an object. The corresponding displacement (s) - time (t) curve is best represented by



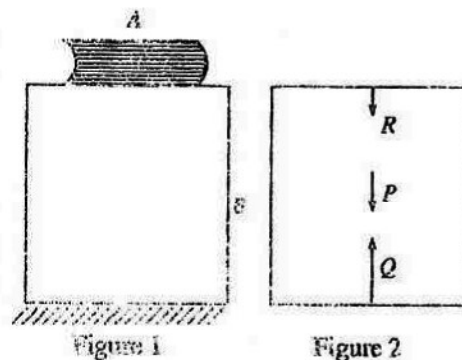
3. Figures A, B, C and D show four ways in which a light spring balance can be loaded with a weight of 100 N using frictionless pulleys.



The scale readings of the spring balances in the four cases would be

	A	B	C	D
(1)	100 N	100 N	100 N	100 N
(2)	100 N	0	200 N	100 N
(3)	100 N	100 N	100 N	200 N
(4)	100 N	0	200 N	200 N
(5)	100 N	100 N	200 N	200 N

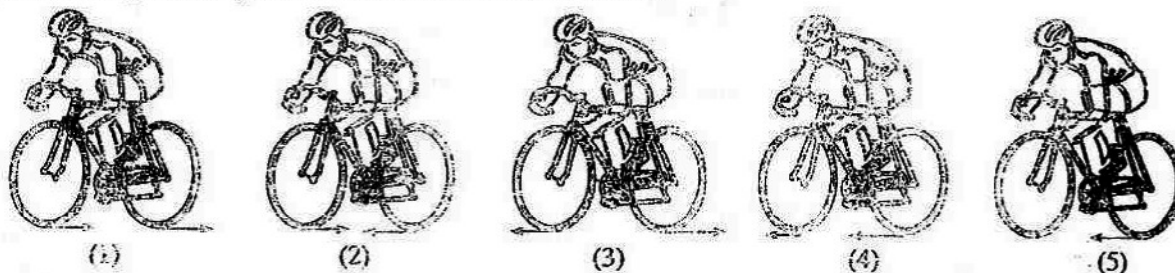
4. Figure 1 shows a book *A* placed on top of a box *B* which rests on the floor. Figure 2 shows the free body force diagram for the box. *P*, *Q*, and *R* indicate the forces acting on the box.



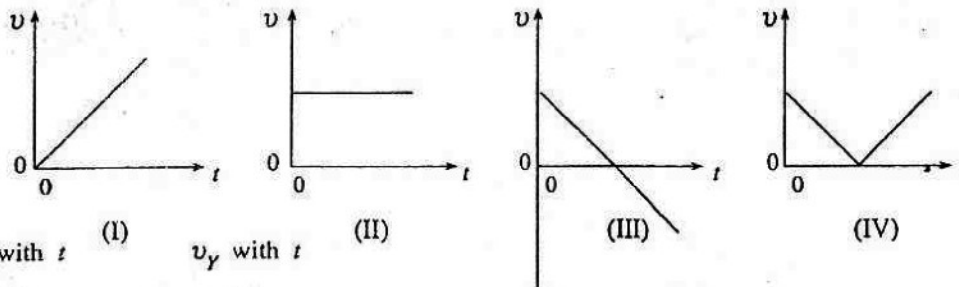
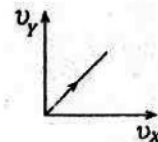
Which of the following statements is true?

- (1) $Q > P + R$
 - (2) Force on the floor exerted by the box is indicated by *P*
 - (3) Force on the floor exerted by the box is indicated by *Q*
 - (4) Force exerted on the box by the book is indicated by *R*
 - (5) $Q < P + R$
5. A particle *P* moving with a uniform velocity of 4 m s^{-1} along *x*-axis passes the origin *O* at time $t = 0$. A second particle *Q* moving along the same direction with a uniform velocity of 5 m s^{-1} passes origin *O* at $t = 1 \text{ s}$. Particle *Q* will reach the particle *P* when they have travelled a distance of
- (1) 10 m from the origin.
 - (2) 16 m from the origin.
 - (3) 20 m from the origin.
 - (4) 25 m from the origin.
 - (5) 30 m from the origin.

6. Which of the following figures shows the directions of the frictional forces acting on the two tyres of a bicycle when it is paddled by a rider on a surface with friction?



7. A stone is thrown at a certain angle with the horizontal in the direction shown by the arrow. If air resistance is ignored, which of the following velocity (*v*) - time (*t*) graphs best represent the variations of v_x with *t*, and v_y with *t*?



- | | | | | |
|-----|---------------------|-----|---------------------|------|
| | v_x with <i>t</i> | (I) | v_y with <i>t</i> | (II) |
| (1) | II | | III | |
| (2) | II | | I | |
| (3) | I | | IV | |
| (4) | II | | IV | |
| (5) | II | | II | |

8. A box of mass 5 kg is placed on a horizontal surface. The coefficient of static friction between the box and the surface is 0.3. If a horizontal force of 10 N is applied to the box, the magnitude of the frictional force acting on the box will be
 (1) 1.5 N (2) 3 N (3) 4.5 N (4) 10 N (5) 15 N
9. A box rests on the floor of an elevator. If the magnitudes of the minimum force required to slide the box on the floor when the elevator is stationary, accelerating upward, and accelerating downward are F_1 , F_2 and F_3 respectively, then
 (1) $F_2 > F_1 > F_3$ (2) $F_1 > F_2 > F_3$ (3) $F_3 > F_2 > F_1$ (4) $F_1 > F_3 > F_2$ (5) $F_1 = F_2 = F_3$

10. Figure (A) shows two blocks of weight 100 N and 400 N which are connected by a light string that passes over a friction less pulley. Figure (B) shows a situation where the heavier block in the system is removed and the string is pulled by a downward force of 400 N. The respective accelerations of the 100 N block in the two situations are given by
 (1) 0.6 m s^{-2} and 3 m s^{-2}
 (2) 6 m s^{-2} and 6 m s^{-2}
 (3) 10 m s^{-2} and 10 m s^{-2}
 (4) 6 m s^{-2} and 40 m s^{-2}
 (5) 6 m s^{-2} and 30 m s^{-2}

