



**R A M**



**(RECALL ALL MEMORY)**

**17**

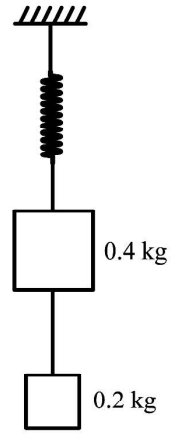
**2 0 2 3  
THEORY**

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

**භෞතික විද්‍යාව** I  
**பௌதிகவியல்** I  
**Physics** I

**Multiple Choice Questions**

1. An object of mass 0.4 kg is hung vertically with a light spring, as shown in the diagram. A second object of mass 0.2 kg is hung on to the first object with a piece of string. Once the setup has reached an equilibrium position, the string is burned. Initial acceleration of the object of mass 0.4 kg is,

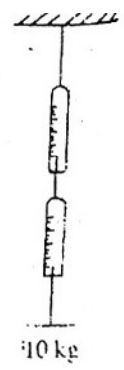


- (1)  $\frac{10}{3} \text{ m s}^{-2}$
- (2)  $5 \text{ m s}^{-2}$
- (3)  $\frac{20}{3} \text{ m s}^{-2}$
- (4)  $10 \text{ m s}^{-2}$
- (5)  $20 \text{ m s}^{-2}$

2. An object of mass 2 kg is accelerated from rest by applying a constant 9 N resultant force. Velocity of the object when it has travelled up to a 4 m distance is,

- (1)  $72 \text{ m s}^{-1}$
- (2)  $36 \text{ m s}^{-1}$
- (3)  $9 \text{ m s}^{-1}$
- (4)  $6 \text{ m s}^{-1}$
- (5)  $3 \text{ m s}^{-1}$

3. Two spring scales of negligible mass are connected together and a 10 kg mass is hung as shown in the figure. Which of the following statements is true ?



- (1) Each scale will read 5 kg.
- (2) Each scale will read 10 kg.
- (3) The bottom scale will read 10 kg and the top one will read zero.
- (4) The top scale will read 10 kg and the bottom one will read zero.
- (5) Each scale will show a reading between zero and 10 kg such that the sum of the two readings is 10 kg.

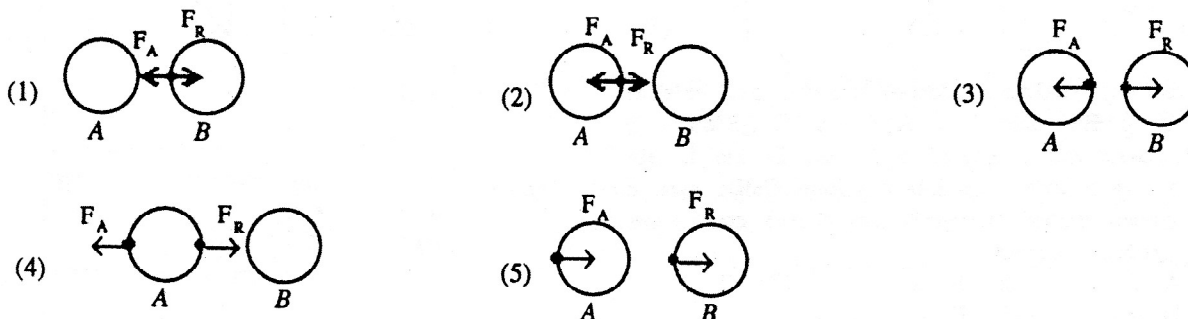
4. A bird flying at a height of 40 m with a speed of  $10 \text{ m s}^{-1}$  drops a small fruit from its mouth. If free fall is assumed the speed of the fruit just before it reaches the ground is

- (1)  $10 \text{ m s}^{-1}$ .
- (2)  $15 \text{ m s}^{-1}$ .
- (3)  $20\sqrt{2} \text{ m s}^{-1}$ .
- (4)  $25 \text{ m s}^{-1}$ .
- (5)  $30 \text{ m s}^{-1}$ .

5. Which one of the following sets of forces cannot have a resultant force?

- (1) 2 N, 2 N, 2 N                      (2) 2 N, 3 N, 4 N                      (3) 1 N, 2 N, 2 N  
 (4) 1 N, 1 N, 2 N                      (5) 1 N, 2 N, 4 N

6. Which of these diagrams correctly indicate the action ( $F_A$ ) and reaction ( $F_B$ ) forces acting on  $A$  and  $B$  objects when they collide with each other?

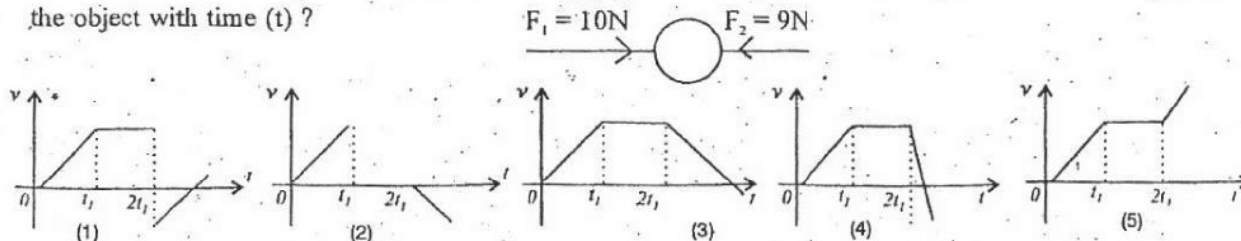


7. A light string passing over a smooth pulley carries a spring balance of mass 1 kg and two weights of masses 1 kg and 2 kg as shown in the figure. The reading on the balance will be.

- (1) zero                      (2) 1 kg                      (3) 2 kg                      (4) 3 kg                      (5) 4 kg

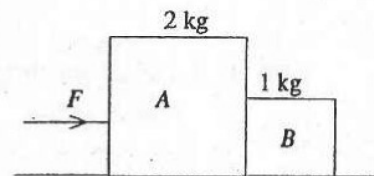


8. Two forces  $F_1$  ( $=10$  N) and  $F_2$  ( $=9$  N) are applied simultaneously to a stationary object at time  $t = 0$  as shown in the figure. The force  $F_2$  is then increased suddenly to 10 N at  $t = t_1$  and the force  $F_1$  is completely removed at time  $t = 2t_1$ , which of the following graphs best represents the variation of the velocity ( $v$ ) of the object with time ( $t$ )?



9. Two blocks  $A$  and  $B$  of masses 2 kg and 1 kg respectively are in contact on a frictionless table. When a horizontal force  $F$  is applied on  $A$  as shown in the figure, the force exerted by  $B$  on  $A$  is 1 N. If instead the same force is applied to  $B$  in the opposite direction, the force exerted by  $A$  on  $B$  is

- (1) 0.5 N.                      (2) 1 N.                      (3) 2 N.  
 (4) 4 N.                      (5) 5 N.



10. Which of the following graphs best represents the variation of velocity,  $v$ , with time,  $t$ , of an object being brought to rest by a constant resultant force?

