RAM | BAM (RECALL ALL MEMORY) | 21

2023 THEORY

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கல்விப் பொதுத் தராதரப் பத்திர(உயர் தர)ப் பரீட்சை, 2023 ஓகஸ்ற்
General Certificate of Education (Adv. Level) Examination, August 2023

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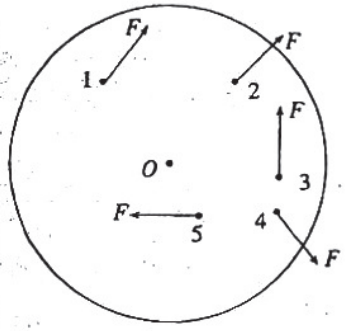
பௌதிகவியல் I
Physics I

Advanced Level Physics
Amith Pussella

PHT**6210** 2023Th 2021-10-14

Multiple Choice Questions

1. A thin disc has freedom to rotate around an axis passing through its centre *O* perpendicular to the plane of the disc. The disc is acted upon by five coplanar forces (1 – 5), equal in magnitude, as shown in the figure.



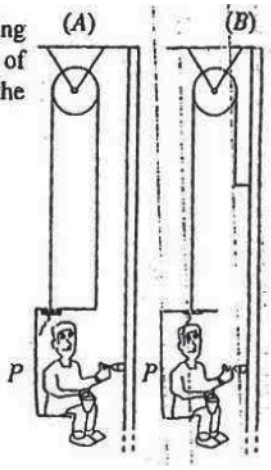
Consider the following statements made about the torques produced by the forces.

(A) Maximum torque is produced by the force 2.
(B) Rotation of the disc due to the resultant torque will be in clockwise direction.
(C) When the magnitudes of the forces are doubled the magnitude of the torque will also be doubled.

Of the above statements

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

2. Figures *A* and *B* show two ways in which a painter could use a system consisting of a platform *P*, a pulley and a rope in painting tall buildings. The total weight of the painter and the platform is 400 N. If the rope is light then the tensions of the rope in the two cases are

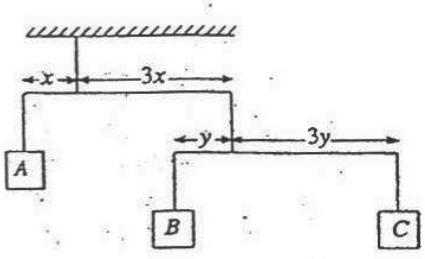


	A	*B*
(1)	400 N	400 N
(2)	400 N	200 N
(3)	200 N	400 N
(4)	200 N	200 N
(5)	100 N	200 N

3. If $(n-1)$ number of main scale divisions of a certain measuring instrument is divided into n vernier scale divisions, then the least count of the instrument in main scale divisions is

(1) 1 (2) $\frac{1}{n}$ (3) $\frac{n}{n-1}$ (4) $\frac{n-1}{n}$ (5) $\frac{1}{n-1}$

4. Three masses *A*, *B* and *C* are hanging from horizontal crossbars as shown in the figure. Each crossbar has negligible mass. If *A* has mass 6 kg, the masses of *B* and *C* respectively are

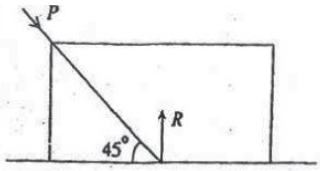


(1) 1·0 kg ; 1·0 kg (2) 1·5 kg ; 0·5 kg
(3) 3·0 kg ; 1·0 kg (4) 0·5 kg ; 1·5 kg
(5) 1·5 kg ; 1·0 kg

5. A golf ball of mass 0·05 kg leaves with a velocity of 70 $m\,s^{-1}$ after being struck by a golf club. If the time of contact of the ball with the golf club is 5×10^{-4} s, the mean force applied by the golf club on the ball is

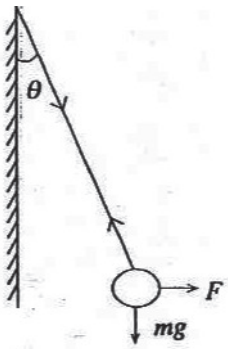
(1) $5{\cdot}0 \times 10^5$ N (2) $2{\cdot}5 \times 10^5$ N (3) $7{\cdot}0 \times 10^3$ N
(4) $1{\cdot}4 \times 10^3$ N (5) $1{\cdot}2 \times 10^3$ N

6. As shown in figure a force P is applied on an object of mass 2 kg lying on a horizontal surface. The coefficient of kinetic friction between the two surfaces is 0·5. If the object moves with uniform velocity the normal force R acting on the object is



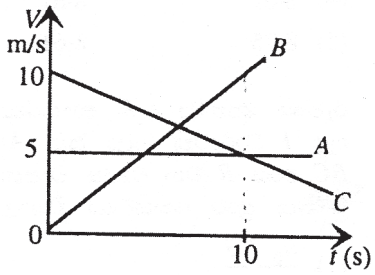
(1) 10 N. (2) $10\sqrt{2}$ N (3) 20 N.
(4) $20\sqrt{2}$ N. (5) 40 N.

7. An object of mass m is hung by a string and is kept in equilibrium as shown in the diagram by a horizontal force F. The magnitude of F is



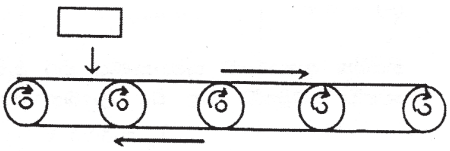
(1) $mg \tan\theta$ (2) $mg \sin\theta$
(3) mg (4) $mg \cos\theta$
(5) $\dfrac{mg}{\tan\theta}$

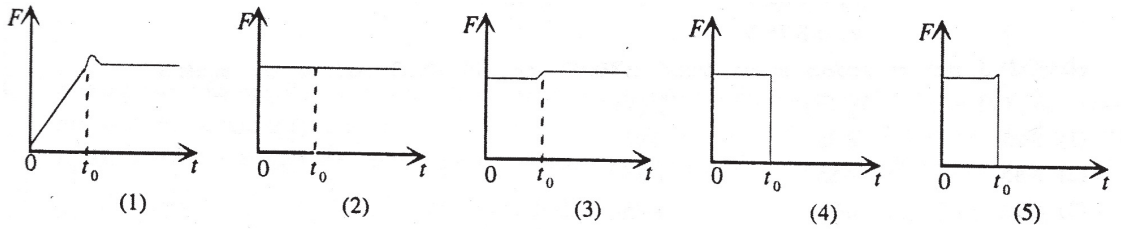
8. Velocity (V) - time (t) curves of three particles namely A, B and C travelling along a straight line are shown in the diagram. If all three particles were seen on the same position at $t = 0$, at $t = 10$ s,



(1) A and B particles will reach the same position.
(2) B and C particles will reach the same position.
(3) C and A particles will reach the same position.
(4) All A, B and C particles will reach the same position.
(5) No particle will reach the same position.

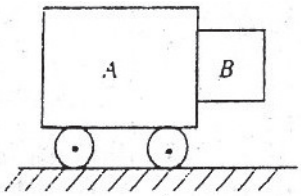
9. At $t = 0$, a box was dropped vertically on to a conveyer belt which was moving along the horizontal direction at a constant velocity as shown in the figure. If the box reaches the velocity of the conveyer belt within a t_0 time period, variation of the magnitude of frictional force (F) exerted on the box by the belt with time (t) is correctly given in,





(1) (2) (3) (4) (5)

10. A trolley A is on a horizontal track. B is a wooden block of mass m. If the coefficient of static friction between the trolley and the block is μ, the minimum acceleration of the trolley that is required to prevent the block from sliding down is



(1) $\dfrac{g}{\mu}$, to the right. (2) g, to the right.
(3) $\dfrac{g}{\mu}$, to the left. (4) μg, to the right.
(5) $\dfrac{mg}{\mu}$, to the right.