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| NAME: | UNIV. NO. |
| GROUP: | YOUR PROF. |

Answer all questions (Numbers are rounded in some answers).

Time: 2 Hours

Q1. A car initially moving at 15 m/s accelerates uniformly to 30 m/s in 100 s. How many kilometers did it go as it accelerated?

- (a) 15.21 km (b) 10.35 km (c) 0.26 km (d) 2.25 km

Q2. A car moving at a velocity of 20 m/s has to brake to avoid crashing into a wall. If the initial distance between the car and the wall is 40 m and the deceleration of the car is 5 m/s^2 then the car:

- (a) Crashes (b) Stop 0.1 m from the wall (c) Stop 2 m before the wall (d) Stops at the wall

Q3. A sandbag that is dropped from a balloon strikes the ground after 20 s. If the balloon is moving vertically upward with a velocity of 20 m/s then the height of the balloon when the sandbag is dropped is:

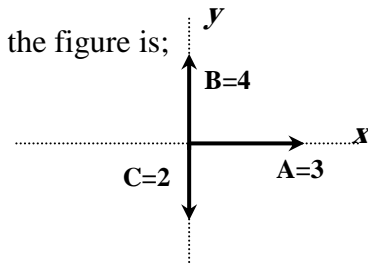
- (a) 1560 m (b) 1960 m (c) 400 m (d) 2360 m

Q4. A ball is thrown vertically upward from the ground with a speed of 29.4 m/s. The time it takes the ball to arrive at a height of 19.6 m on its way back is:

- (a) 0.652 s (b) 1.345 s (c) 5.235 s (d) 0.052 s

Q5. The magnitude of $\vec{A} + \vec{B} - \vec{C}$ of the vectors shown in the figure is;

- (a) 3.6
(b) 5.1
(c) 9.7
(d) 6.7



Q6. A sphere A has twice the mass and three times the radius of sphere B. The ratio of A density to B density is;

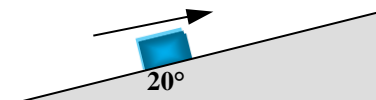
- (a) 0.074 (b) 0.22 (c) 13 (d) 7.4

Q7. If a car of 100 kg travels 100 m with a constant speed of 20 m/s for 10 s. The resultant force acting on the car is:

- (a) zero (b) 200 N (c) -200 N (d) 150 N

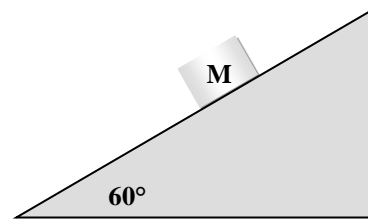
Q8. A box is given an initial velocity of 5 m/s up a smooth 20° incline surface. The distance the box travel before coming to rest is:

- (a) 4.45 m
(b) 2.73 m
(c) 1.10 m
(d) 3.73 m



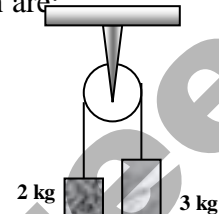
Q9. A block slides down on a rough inclined plane (as shown) with an acceleration of $g/2$. The coefficient of kinetic friction is:

- (a) 0.62
(b) 0.73
 (c) 0.54
 (d) 0.35



Q10. In the figure shown, the tension in the rope and the acceleration are:

- (a) 10.96 N, 6.15 m/s²
 (b) 15.23 N, 2.32 m/s²
 (c) 20.51 N, 2.35 m/s²
(d) 23.52 N, 1.96 m/s²

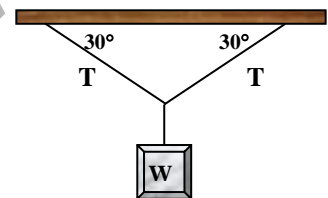


Q11. What condition or conditions are necessary for total static equilibrium?

- (a) Only $\sum \vec{v} = 0$ (b) Only $\sum \vec{\tau} = 0$ **(c) Only $\sum \vec{F} = 0$ and $\sum \vec{\tau} = 0$** (d) Only $\sum \vec{F} = 0$

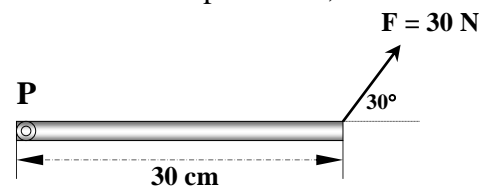
Q12. In the figure shown, if the tension T in the strings is 20 N, the weight W will be;

- (a) 30 N
 (b) 60 N
 (c) 90 N
(d) 20 N



Q13. In the figure shown, the torque produced by the force F about point P is;

- (a) 450 N.m clockwise
(b) 4.50 N.m counterclockwise
 (c) 450 N.m counterclockwise
 (d) 4.50 N.m clockwise



Q14. A box of weight $W = 50$ N is pulled 6 m horizontally. The work done by W is;

- (a) zero** (b) -300 J (c) 300 J (d) 150 J

Q15. A 2 kg object starts from rest moving down on an inclined surface with $\theta = 42^\circ$. After moving 0.8 m, its kinetic energy is 7 J. The work done by the friction is;

- (a) -8.68 J (b) -5.60 J (c) -4.65 J **(d) -3.49 J**

Q16. An object with an initial velocity 8 m/s stops in 10.2 m on a flat rough surface. The coefficient of kinetic friction between the surface and the object is;

- (a) 0.16 J (b) 0.64 J **(c) 0.32 J** (d) 3.137 J

Q17. A man of 65 kg mass climbs a hill of 500 m in height in 21 minutes. The power of the man is

- (a) 2.95 W (b) 15166 W (c) 1477.3 W **(d) 252.8 W**

Q18. A Car must do a work at a rate of 8 kW to maintain a constant speed of 20 m/s on a flat ground road. What is the force producing the work?

- (a) 600 N (b) 800 N (c) 300 N (d) 400 N

Q19. If you increase your kinetic energy while jogging by a factor of 2, then your momentum will change by a factor of;

- (a) $1/2$ (b) $3\sqrt{2}$ (c) 2 (d) $\sqrt{2}$

Q20. An impulse of 50 kg m/s is given to an object. If the impulse only last 0.5 s, what average force was applied to the object?

- (a) 100 kg m/s² (b) 125 kg m/s (c) 250 N (d) 50 kg m/s²

مع تمنياتنا لكم بالتوفيق والنجاح

