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CHERCHER SECONDARY SCHOOL

**GRADE 11<sup>TH</sup> PHYSICS WORKSHEET FROM UNIT 4.IN 2016 E.C**

**FROM THE GIVEN ALTERNATIVES CHOOSE THE BEST ANSWER**

1. A spaceman of mass 80 kg is sitting in a spacecraft near the surface of the Earth. The spacecraft is accelerating upward at five times the acceleration due to gravity. What is the force of the spaceman on the spacecraft? **(A)** 4800 N **(B)** 4000 N **(C)** 3200 N **(D)** 800 N
2. A ball attached to a string is whirled around in a horizontal circle having a radius R. If the radius of the circle is changed to 4R and the same centripetal force is applied by the string, the new speed of the ball is which of the following?  
**(A)** One-quarter the original speed **(B)** One-half the original speed **(C)** The same as the original speed **(D)** Twice the original speed
3. Inside a washing machine, the radius of the cylinder where the clothes sit is 0.5 m. In one of its settings the machine spins the cylinder at 2.0 revolutions per second. What is the acceleration of an item of clothing?  
**(A)**  $0.080 \text{ m/s}^2$  **(B)**  $1.6 \text{ m/s}^2$  **(C)**  $8.0 \text{ m/s}^2$  **(D)**  $79 \text{ m/s}^2$
4. A force F at an angle  $\theta$  above the horizontal is used to pull a heavy suitcase of weight mg a distance d along a level floor at constant velocity. The coefficient of friction between the floor and the suitcase is  $\mu$ . The work done by the frictional force is:  
**(A)**  $-Fd \cos \theta$  **(B)**  $-\mu Fd \cos \theta$  **(C)**  $-\mu mgd$  **(D)**  $-\mu mgd \cos \theta$
5. A 2 kg ball is attached to a 0.80 m string and whirled in a horizontal circle at a constant speed of 6 m/s. The work done on the ball during each revolution is:  
**(A)** 90 J **(B)** 72 J **(C)** 16 J **(D)** zero
6. A ball with a mass of 0.50 kg and a speed of 6 m/s collides perpendicularly with a wall and bounces off with a speed of 4 m/s in the opposite direction. What is the magnitude of the impulse acting on the ball? **(A)** 1 Ns **(B)** 5 Ns **(C)** 2 m/s **(D)** 10 m/s
7. A mass m has speed v. It then collides with a stationary object of mass 2m. If both objects stick together in a perfectly inelastic collision, what is the final speed of the newly formed object? **(A)**  $v/3$  **(B)**  $v/2$  **(C)**  $2v/3$  **(D)**  $3v/2$

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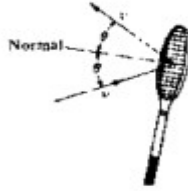
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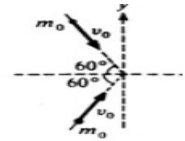
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8. A tennis ball of mass  $m$  rebounds from a racquet with the same speed  $v$  as it had initially as shown. The magnitude of the momentum change of the ball is  
(A) 0 (B)  $2mv$  (C)  $2mv\sin\theta$  (D)  $2mv\cos\theta$



9. Two particles of equal mass  $m_0$ , moving with equal speeds  $v_0$  along paths inclined at  $60^\circ$  to the x-axis as shown, collide and stick together. What is their velocity after the collision ? B

- (A)  $\frac{v_0}{4}$  (B)  $\frac{v_0}{2}$  (C)  $\frac{\sqrt{3}v_0}{2}$  (D)  $v_0$



10. Which one of the following statements is **NOT** correct about the concept and units of coefficient of friction? **A.** Coefficient of friction is the ratio of frictional force to normal force. **B.** Coefficient of static friction is less than its value of kinetic friction. **C.** Coefficient of static friction has no unit. **D.** The coefficient of friction is always less or equal to unity (1)
11. Which one of the following statements is correct about the impulse on an object?  
**A.** The impulse on an object is changed when the net force acting on the object is zero.  
**B.** The area under the curve of momentum versus time graph is the impulse on an object.  
**C.** Impulse is the change in momentum when a force is exerted on an object for a very short period of time. **D.** Impulse is the rate of change in momentum due to external force exerted on an object for a very short period of time.
12. Consider two collisions that occurred between two trolleys having the same mass, moving with the same speed, and in opposite directions,  
Collision 1:- after collision the two trolleys bounce back with the same speed.  
Collision 2:- after collision the two trolleys stick together due to magnetic coupler.

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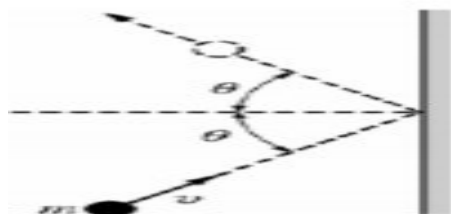
Which of the following statement is correct about the two collisions?

- A.** Both collisions are elastic. **B.** Collision 1 is elastic and collision 2 is inelastic.  
**C.** Both collisions are inelastic. **D.** Collision 1 is inelastic and collision 2 is elastic.

13. Suppose that you are given a mass attached to a spring and oscillates up and down. This mass-spring system has maximum gravitational potential energy (GPE), elastic potential energy (EPE) and kinetic energy (KE) at the

- A.** middle, top and bottom respectively. **B.** middle, bottom and top respectively.  
**C.** bottom, middle and top respectively. **D.** top, bottom and middle respectively.

14. A ball of mass  $m$  with speed  $v$  strikes a wall at an angle  $\theta$  with the normal, as shown. It then rebounds with the same speed and at the same angle. The impulse delivered by the ball to the wall is **(A)**  $mv \sin \theta$  **(B)**  $mv \cos \theta$  **(C)**  $2mv \sin \theta$  **(D)**  $2mv \cos \theta$



15. The angular velocity of a body is  $\omega = 6\mathbf{i} + 10\mathbf{j} + 4\mathbf{k}$  rad/sec and a torque  $\tau = 6\mathbf{i} - 4\mathbf{j} + 4\mathbf{k}$  Nm acts on it. What is the rotational power delivered?

- A.** 55watt **B.** 123w **C.** 56watt **D.** 24watt

16. Which Of The Following Is **Not Correct** About Momentum? **A.** The total linear momentum of an isolated system remains constant. **B.** Impulse is the change in momentum. **C.** Impulse and momentum have the same unit. **D.** Linear momentum is mass multiplied by impulse.

17. Which one is **correct** about the first condition of equilibrium? **A.** The net force is zero **B.** The net torque is zero **C.** clockwise moment should balances anticlockwise moment **D.** the torque produced by force should be perpendicular to the force

18. A dancer spins around with her arms stretched out at an angular speed of  $1\text{ rad/s}$ . Her moment of inertia is  $80\text{ kgm}^2$ . when she pulls in her arms the moment of inertia decreased to  $40\text{ kgm}^2$ . What is her final angular velocity?

- A.**  $0.2\text{ rad/s}$  **B.**  $1.5\text{ rad/s}$  **C.**  $2\text{ rad/s}$  **D.**  $3\text{ rad/s}$

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19. Dynamics is a branch of mechanics concerned with the motion of an object.

- A. Under the action of forces                      B. Whose velocity constant  
C. Under the action of balanced forces      D. Without its cause

20. What is the area under the forces Vs Displacement ?   A. acceleration   B. Work   C.  
Momentum   D. Impulse

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