

St. Lawrence High School A Jesuit Christian Minority Institution <u>Term : 1st</u> Solution of Work Sheet – 16 Subject – Physics

Class - XI

Chapter - Laws of motion

Choose the correct option for the following questions.

- 1. The pulleys and strings shown in the figure are smooth and are of negligible mass. for the system to remain in equilibrium, the angle θ should be
 - a. 0°
 - b. 30°
 - c. 45°
 - d. 60°

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Ans: c. 45°
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- 2. The figure shows a horizontal force F acting on a block of mass M on an inclined plane as shown. What is the normal reaction on the block?
 - a. Mg sin θ + F cos θ
 - b. Mg sin θ F cos θ
 - c. Mg cos θ F sin θ
 - d. Mg cos θ + F sin θ

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Ans: d. Mg cos θ + F sin θ
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- 3. A man of mass 60 kg is riding in a lift. The weights of the man, when lift is accelerating upwards and downwards at 2 m/s² are respectively ($g = m/s^2$)
 - a. 720 N, 480 N
 - b. 480N, 720N
 - c. 600N, 600N
 - d. None of these

Ans: a. 720 N, 480 N

- 4. Two blocks of masses 5kg and 10kg are connected to a pulley as shown. What will be their acceleration if the pulley is set free?
 - a. g
 - b. g/3
 - c. g/2
 - d. g/4

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Ans: b. g/3
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- 5. In the figure, all the surfaces are frictionless. What will be the acceleration of the mass m'?
 - a. g
 - b. $\frac{m'g}{m+m}$
 - c. $\frac{m+r}{m}$
 - $\frac{1}{m'}g$
 - d. $\frac{mg}{m-m'}$



Date - 02.07.20

Topic - Mass-Pulley system









 $1 \times 15 = 15$

- 6. Two bodies of masses 5kg and 4 kg are arranged in two different ways as shown in fig-A and in fig-B. The pulleys and surfaces are frictionless and the strings are mass less and inextensible. The acceleration of 5kg body in case A and B are respectively –
 - a. $g \text{ and } \frac{5}{9}g$ b. $\frac{4}{9}g \text{ and } \frac{1}{9}g$ c. $\frac{g}{5} \text{ and } \frac{g}{5}$ d. $\frac{5}{9}g \text{ and } \frac{1}{9}g$. Ans: b. $\frac{4}{9}g \text{ and } \frac{1}{9}g$.



- 7. Three equal weights each of mass 4kg are hanging on a string passing over a fixed pulley as shown in the fig. what is the tension in the string connecting weights B and C?
 - a. Zero
 - b. 13.3 N
 - c. 26.6 N
 - d. 19.6 N

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<mark>Ans: c. 26.6 N</mark>
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- 8. Two blocks each of mass m are released on frictionless inclined planes as shown in the figure. Then
 - a. The block A moves down the plane
 - b. The block B moves down the plane
 - c. Both remain at rest
 - d. Cannot be predicted.

Ans: The block A moves down the plane

- 9. Two blocks of same mass are placed as shown in the figure. Their common acceleration is
 - a. 0
 - b. $\frac{g}{2}$ sin θ
 - c. g sinθ
 - d. 2*g sinθ*
 - Ans: b. $\frac{g}{2}$ sin θ

10. Three masses are placed on a smooth horizontal plane and F force is applied as shown. The ratio of the tensions T_1 and T_2 is –

- a. $\sqrt{3}:1$
- b. 1: $\sqrt{3}$
- c. 1:5
- d. 5:1

Ans: d. 5:1



M

60

30

11. As, shown in the figure the mass M = 10g. Then mass m needed in order to keep M at rest is –

- a. 5 g
- b. $10\sqrt{3}$ g
- c. 0.10 g
- d. $\sqrt{3}$ g
 - Ans: a. 5g
- 12. In the fig, if ends P and Q of the inextensible string move downward with uniform speed v, then the mass M moves upward with speed
 - а. *v cosθ*
 - b. $\frac{v}{\cos\theta}$
 - c. 2*ν cosθ*
 - d. $\frac{v}{2\cos\theta}$ Ans: b. $\frac{v}{\cos\theta}$
- 13. Two masses are placed on a smooth inclined plane as shown in the figure. $< PRQ = 37^{\circ}$. Then which statement

will be correct about the system? $\left(\cos 37^\circ = \frac{4}{r}\right)$

- a. The force on the masses down the inclined plane are equal
- b. The force on the masses down the inclined plane are independent of the angle < PRQ.
- c. The acceleration of the masses down the inclined plane are equal
- d. Down the inclined plane, acceleration of 7kg is more than that of 3kg
 Ans: c. The acceleration of the masses down the inclined plane are equal
- 14. Choose the correct option regarding the acceleration of the masses down the inclined plane
 - a. Acceleration of 7kg mass is $\frac{21}{5}$ m/s²
 - b. Acceleration of 3kg mass is $\frac{9}{5}$ m/s²
 - c. Acceleration of both are equal to 6 m/s^2
 - d. Acceleration of both are equal to 20 m/s^2

Ans: c. Acceleration of both are equal to 6 m/s²

15. In problem – 13, what is the force 7kg mass exerts on 3kg mass while slide down with some acceleration?

- a. 100 N
- b. 42 N
- c. 18 N
- d. 0 N

<mark>Ans: d. 0 N</mark>





M