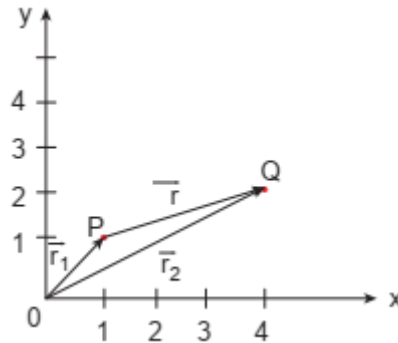**XL- PHYSICS PUBLIC IMPORTANT COMPULSORY QUESTIONS -2024**

UNIT -1,2,3,4,5,(volume 1)

Prepared by Dr.G.THIRUMOORTHI ,Govt Arts college (A) Salem -7

1.Calculate the displacement vector for a particle moving from a point P to Q as shown below. Calculate the magnitude of displacement.

2. Consider an object travelling in a semicircular path from point O to point P in 5second, as shown in the Figure given below. Calculate the average velocity and average speed.
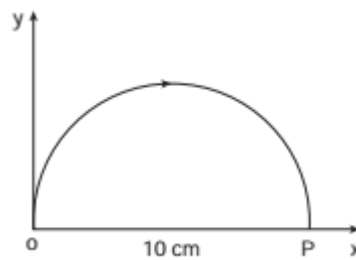

3. Calculate the angle q subtended by the two adjacent wooden spokes of a bullock cart wheel is shown in the figure. Express the angle in both radian and degree.

4. A foot-ball player hits the ball with speed 20 m s^{-1} with angle 30° with respect to horizontal direction as shown in the figure. The goal post is at distance of 40 m from him. Find out whether ball reaches the goal post?
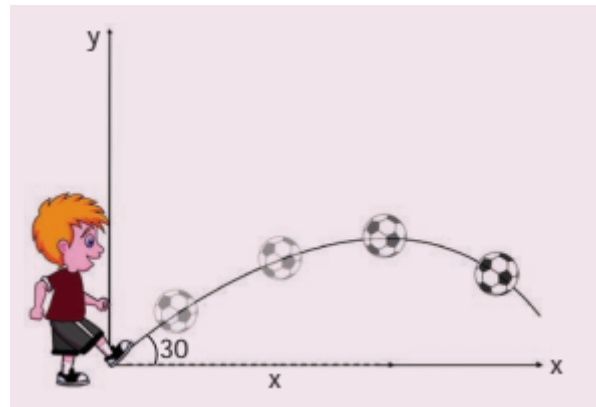

5. The following velocity–time graph represents a particle moving in the positive x–direction. Analyse its motion from 0 to 7 s. Calculate the displacement covered and distance travelled by the particle from 0 to 2 s.
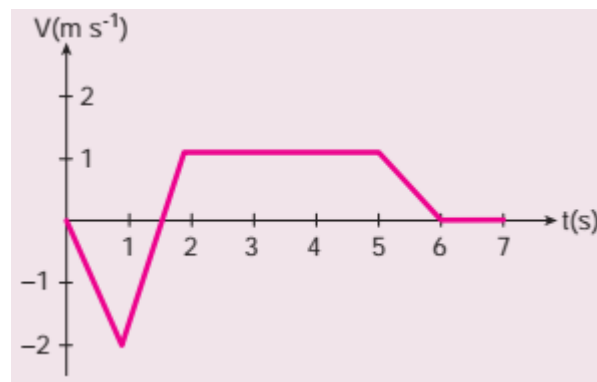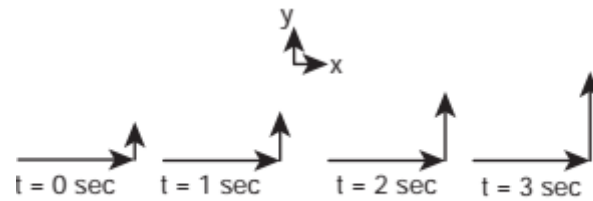

6. The following graphs represent velocity – time graph. Identify what kind of motion a particle undergoes in each graph
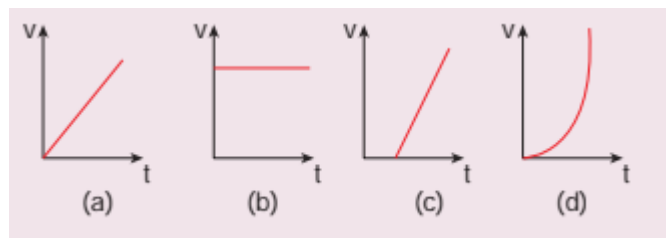

7. Identify the forces acting on blocks A, B and C shown in the figure.
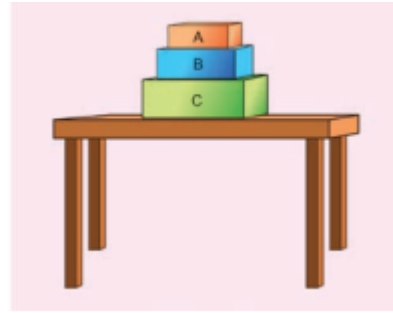
8. The velocity of a particle moving in a plane is given by the following diagram. Find out the direction of force acting on the particle?


9. Consider a bob attached to a string, hanging from a stand. It oscillates as shown in the figure. a) Identify the forces that act on the bob? b) What is the acceleration experienced by the bob?
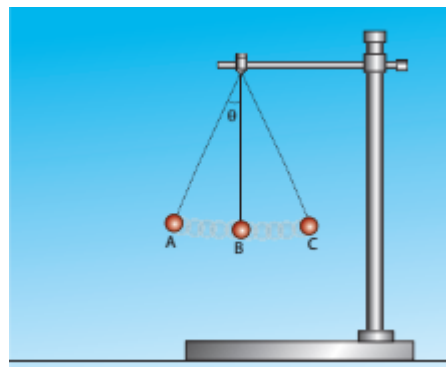

10. Which is the greatest force among the three force $\vec{F_1}, \vec{F_2}, \vec{F_3}$ shown below
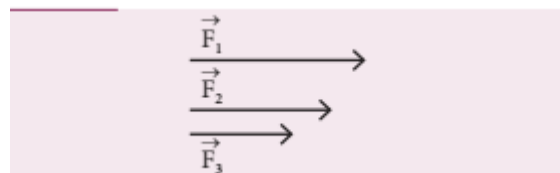

11. A baby is playing in a swing which is hanging with the help of two identical chains is at rest. Identify the forces acting on the baby. Apply Lami's theorem and find out the tension acting on the chain
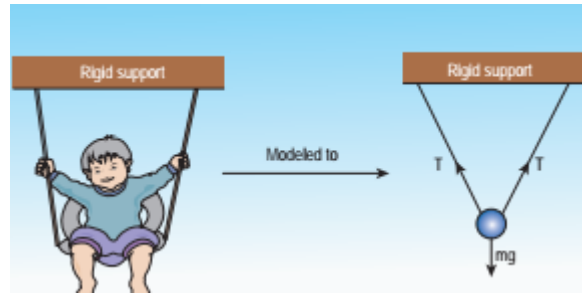
12. Two bodies of masses 15 kg and 10 kg are connected with light string kept on a smooth surface. A horizontal force F=500 N is applied to a 15 kg as shown in the figure. Calculate the tension acting in the string
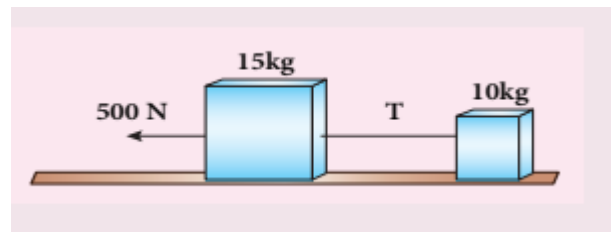

13. Apply Lami's theorem on sling shot and calculate the tension in each string ?
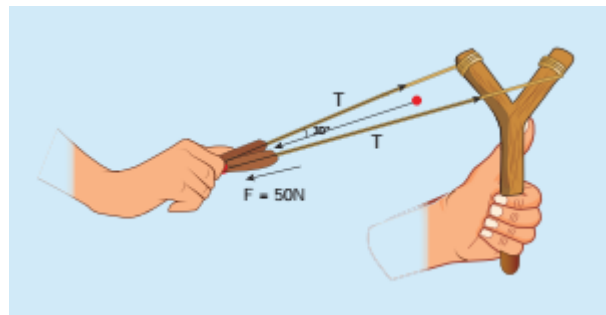

14. Imagine that the gravitational force between Earth and Moon is provided by an invisible string that exists Imagine that the gravitational force between Earth and Moon is provided by an invisible string that exists
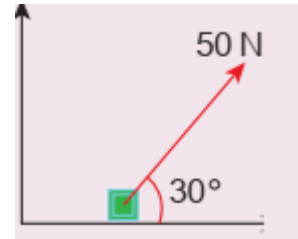
(Mass of the Moon = 7.34×10^{22}

Distance between Moon and Eart

3.84×10^8 m)

Moon

Invisible
string

Earth
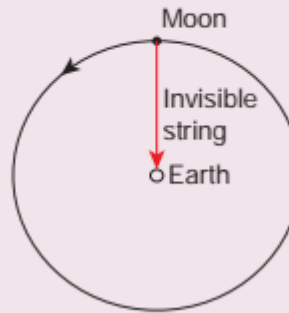
15. Calculate the acceleration of the bicycle of mass 25 kg as shown in Figures 1 and 2.


500 N

400 N

400 N

400 N
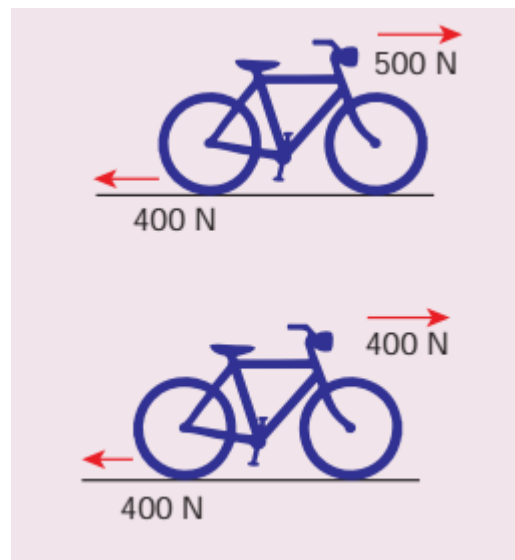
16. A force of 50N act on the object of mass 20 kg. shown in the figure. Calculate the acceleration of the object in x and y directions

17. A spider of mass 50 g is hanging on a string of a cob web as shown in the figure. What is the tension in the string
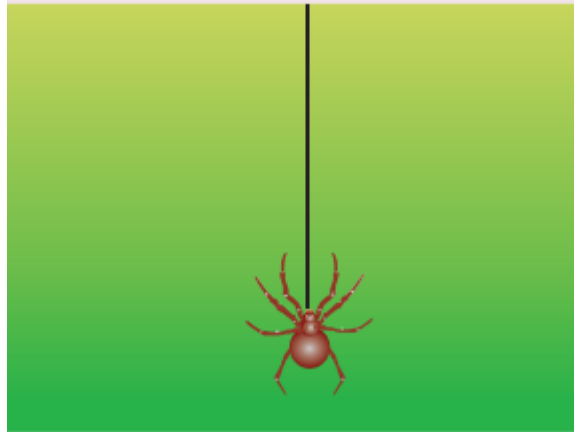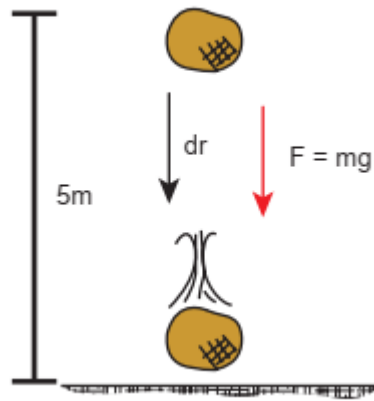

18. A box is pulled with a force of 25 N to produce a displacement of 15 m. If the angle between the force and displacement is 30^0, find the work done by the force.
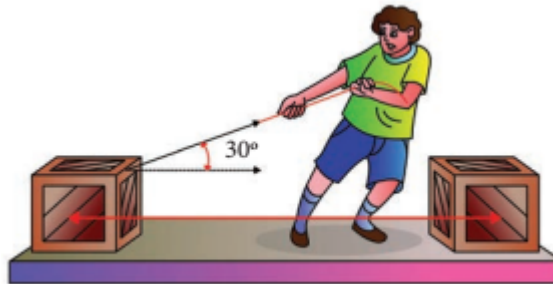

19. An object of mass 2 kg falls from a height of 5 m to the ground. What is the work done by the gravitational force on the object?

(Neglect air resistance; Take g = 10 m s⁻²)

20. If the force applied is perpendicular to the handle of the spanner as shown in the diagram, find the (i) torque exerted by the force about the centre of the nut, (ii) direction of torque and (iii) type of rotation caused by the torque about the nut
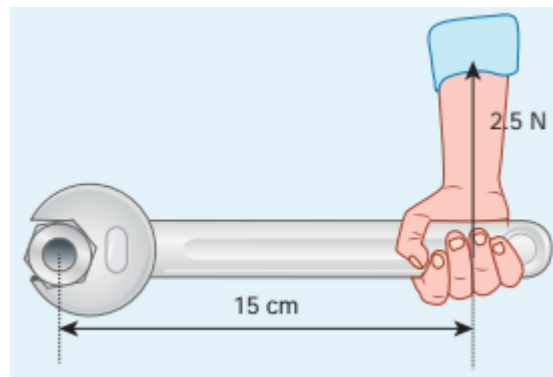
21. Find the moment of inertia about the geometric centre of the given structure made up of one thin rod connecting two similar solid spheres as shown in Figure.
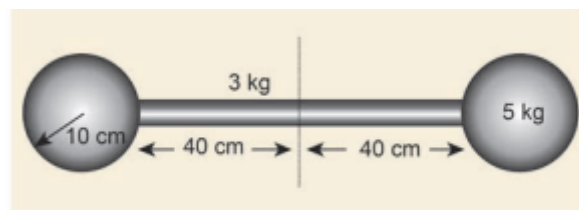
PREPARED BY

Dr.G.THIRUMOORTHI ,M.Sc.B.Ed.Ph.D

GOVT ARTS COLLEGE (A) SALEM- 7

PHYSICS

thiruphysics1994@gmail.com

8610560810