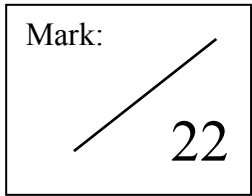


Name:

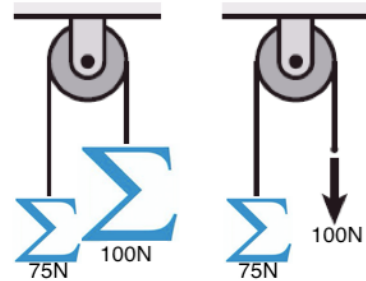
PRELIMINARY PHYSICS SIGMA SCIENCE Q&A

Mark:  22

Week 1: Pulleys and Inclined Planes

Question 1 (5 marks)

The pulley systems indicated on the right both contain forces of 75N and 100N. If the 75N weight starts a vertical displacement of 10cm from the pulley, determine the time taken for the weight to strike the pulley. Account for your results.



.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

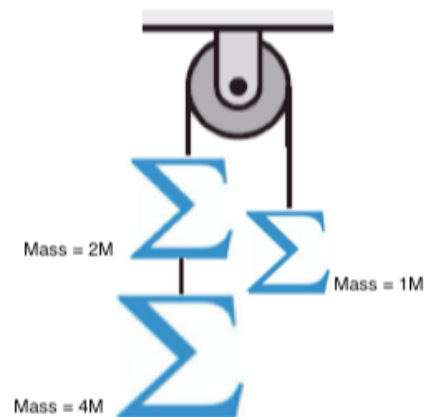
.....

.....

Question 2 (4 marks)

3 objects of different masses are hung over a pulley system as indicated in the diagram on the right.

Assuming that this is an ideal pulley and the string is massless and inextensible, determine any tension force(s) in the string(s) and the acceleration of the system.



.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Question 3 (7 marks)

A 7 kg box is put on the surface of an inclined plane at 33° with the horizontal. The surface of the inclined plane is assumed to be frictionless.

a) Draw a free body diagram of the box on the inclined plane and label all forces acting on the box. **3**

b) Determine the acceleration, 'a' of the box down the plane. **2**

.....

.....

.....

.....

.....

.....

c) Determine the magnitude of the force exerted by the inclined plane on the box. **2**

.....

.....

.....

.....

.....

.....

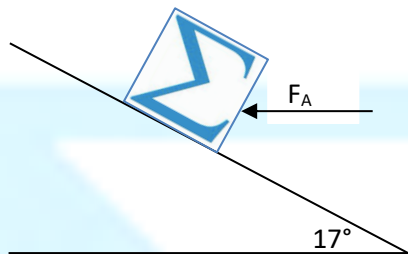
Question 4 (6 marks)

A box of mass $M = 17 \text{ kg}$ is held at rest on a 17° inclined plane by force F_a acting horizontally as shown in the figure below.

The box is on the point of sliding down the inclined plane.

(a) Find the magnitude of force F_a .

3



.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(b) Determine the force which the plane exerts on the mass.

3

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....