SAN FRANĠISK T'ASSISI BOYS' SECONDARY SCHOOL – ST. VENERA

HALF YEARLY EXAMINATIONS 2007/2008

FORM: 3	**Physics**	Time: **1.5hrs**

Name:_____ Class:_____

Useful Formulae

Density $= \frac{m}{V}$ **Weight = mg** **Work = Fd**

Potential = mgh **Kinetic** $= \frac{1}{2}mv^2$ **Power** $= \frac{E}{t}$

Moment = Fd

Consider g to be 10 in all calculations.

Section A: Work all these questions in this section. This section carries 40marks

1. *This question is about units of measurements*.

a) Fill in the following table with the appropriate words:

(12)

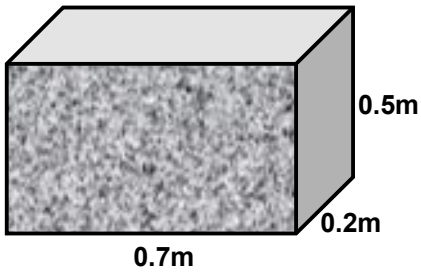
s, L, area, stopwatch, ruler, mass, V, Force, electronic balance, N, m^3

Quantity	Symbol	Unit	Apparatus
Length		m	
	F		spring balance
Volume			measuring cylinder
	m	Kg	
Time	T		
	A	m^2	

2. *This question is about density*

a) John was trying to find the density of a stone block. The block had a mass of 20kg.

i. From the diagram, find the volume of the stone block.



(2)

ii. Find also the density of the stone block.

(2)

iii. John thinks that the density of stone is larger than that of iron. Do you think that John is right? Explain you answer giving your reasons.

(2)

3. *This question is about forces.*

a) Work out and draw the **resultant forces** of the following examples. The first one is already worked out as an example.

EX 

i. 

ii. 

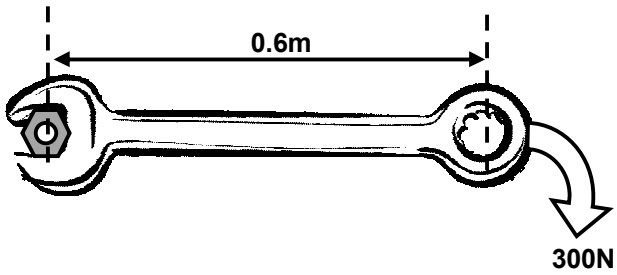
iii. 

iv. 

(8)

4. *This question is about turning forces.*

a) The diagram shows a spanner 0.6m long and is going to be turned with the force of 300N.



i. In which direction is the spanner going to be turned?

(1)

ii. Calculate the moment of the force applied onto the spanner

(2)

iii. If the worker finds it hard to turn the spanner, what is the best way to solve the problem? Underline the correct answer.

A. Hammer the spanner

B. Pull the spanner

C. Increase the length of the spanner

D. Make the spanner shorter.

(1)

5. *This question is about conservation of energy.*

a) The table shows the energy change from one form to another by the use of a device. Fill in the table to show the energy change from one form to the other.

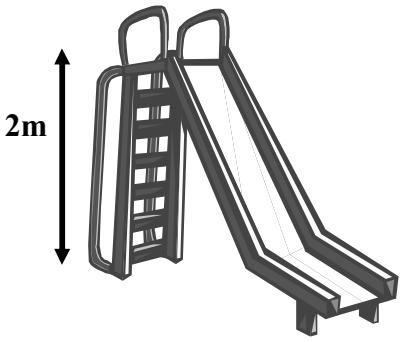
Device	Energy Input	Energy Output
Bulb	**Electric**	**Light**
Gas Heater		
Portable Radio		
Power Station		
Torch		
Ball falling		

(10)

Section B: Answer all questions in this section. This section carries 45marks

6. *This question is about turning forces and energy.*

a) One morning Jack and Sonia went playing at a local playing ground. Jack of mass 50kg went to play onto a slide as seen in the below diagram.



i. What type of energy is created when Jack climbs the ladder and reaches the top of the slide?

(1)

ii. Calculate this energy when Jack is at the top of the slide.

(3)

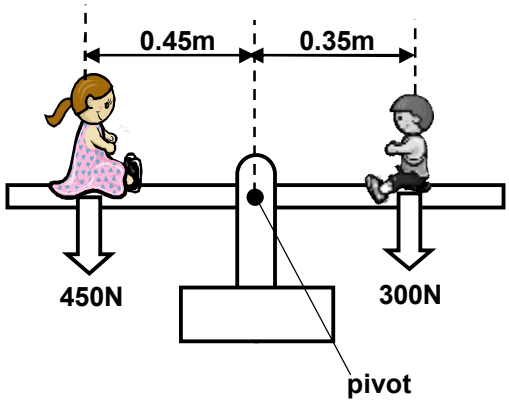
iii. What happens to this energy when Jack slides down the slide?

(2)

iv. What is the value of this energy, giving reasons for your answer?

(2)

b) Jack and Sonia went onto the see-saw to play.



i. Calculate the moment of Jack.

(2)

ii. Calculate the moment of Sonia.

(2)

iii. Who has the higher moment?

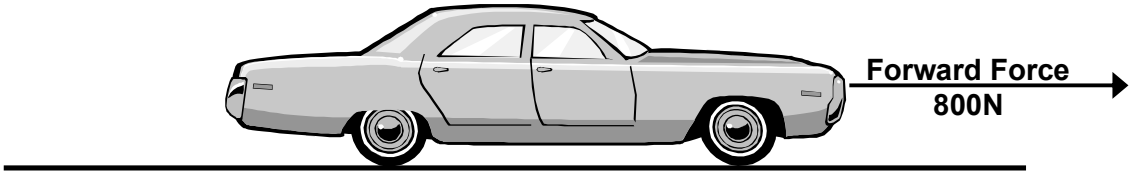
(1)

iv. What must Jack do in order to win during playing see-saw?

(2)

7. *This question is about forces and energy.*

a) A car of mass 1500kg was moving with the forward force of 800N.



i. On the above diagram **draw** the forces of:

Friction, **Airdrag**, **Weight**, **Reaction Front** and **Reaction Back** (5)

ii. Calculate the weight of the car in Newtons.

(2)

iii. Calculate the reaction of one wheel of the car.

(2)

iv. If the car kept the same forward force and travelled for a distance of 8m, calculate the energy used by the car.

(3)

v. If the car travelled for a time of 12seconds, calculate the power of the car forward.

(2)

b) During travelling, it was noticed that the airdrag had a value of 200N and friction had a value of 100N. Calculate the resultant forward force on the car.

(1)

8. *This question is about Hooke's Law.*

a) Some students were doing the experiment of Hooke's Law in the lab.

i. Label the following apparatus.

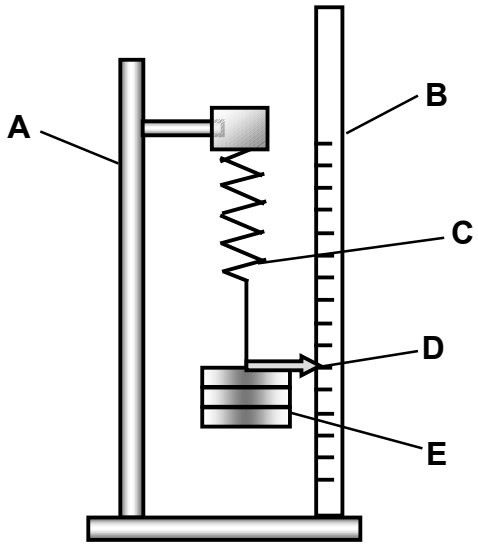
A = _____

B = _____

C = _____

D = _____

E = _____ (5)



b) The students started loading the spring with 1N loads and recorded the extension produced. The initial length of the spring was of 10cm.

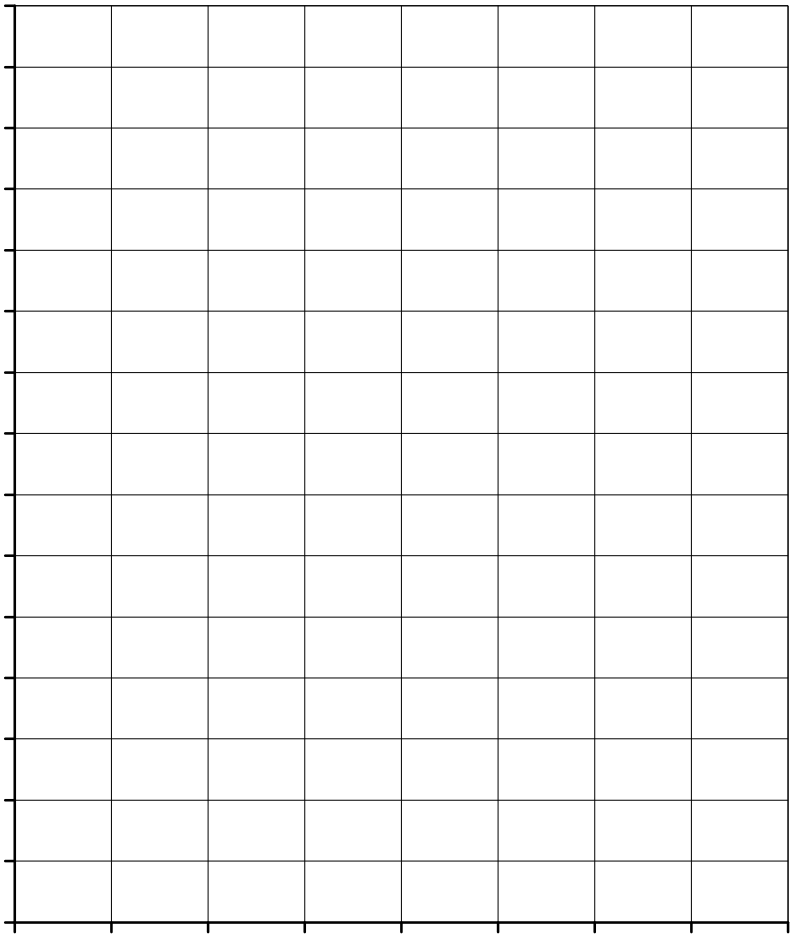
i. Continue the following table of readings by filling the extension produced in each case.

Load/N	0	1	2	3	4	5	6	7
Length/cm	10	14	18	22	26	30	34	38
Extension/cm	0							

(2)

ii. Use the above table to plot a graph of Load/N on the *x*-axis against Extension/cm on the *y*-axis.

(6)



c) At one point when the student loaded the spring with 8N, the spring went beyond the elastic limit. What do we mean by elastic limit and what happened to the spring.

(2)

END OF EXAM