

MARIA REGINA COLLEGE  
GIRLS' SECONDARY - MOSTA  
HALF YEARLY EXAMINATION - 2011

Form 3

Physics

Time : 1½ hr

Name \_\_\_\_\_

Class \_\_\_\_\_

Practical Exam (15)	Written Paper (85)	Total (100)

**Answer all questions.**

Where necessary  $g=10\text{N/kg}$

**Section A**

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

$$F = PA$$

$$P = \frac{F}{A}$$

$$P = h\rho g$$

$$W = mg$$

$$\text{Moments} = Fs$$

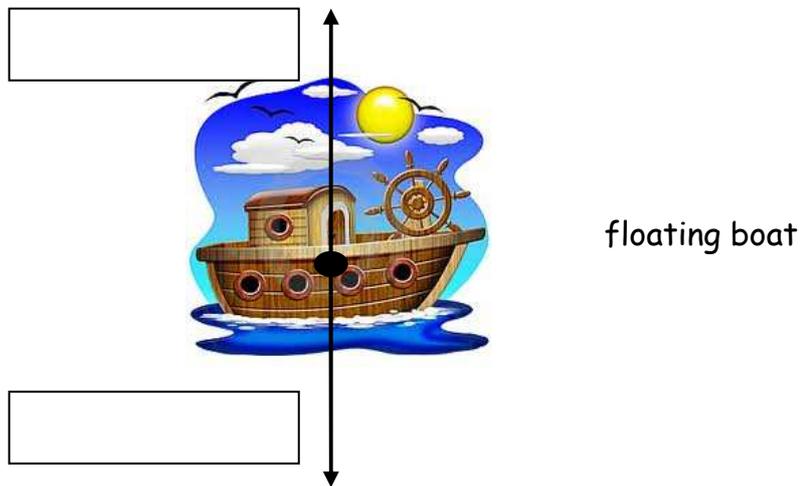
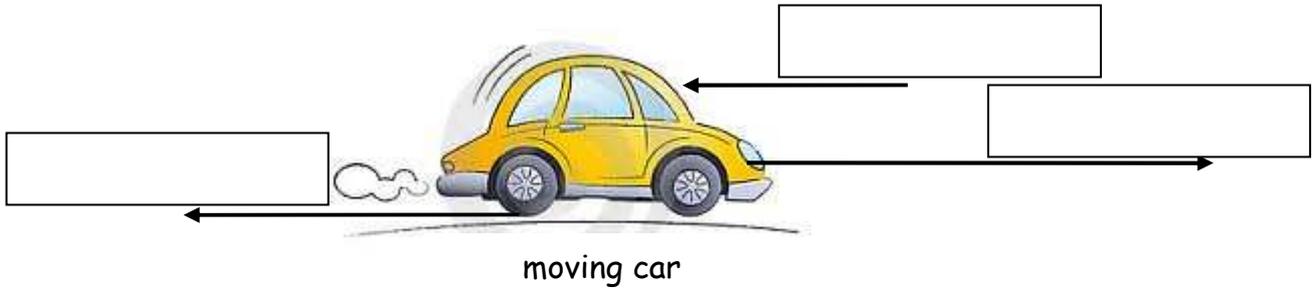
1) Write down the name of the following apparatus.

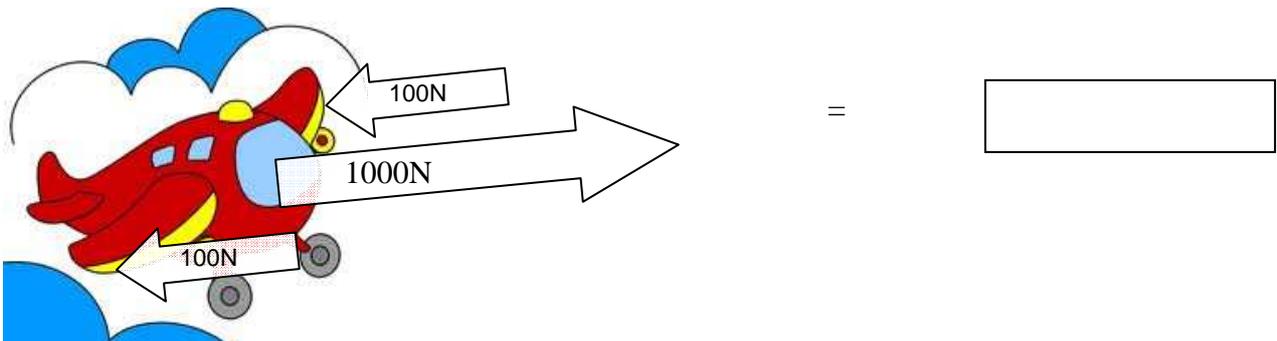
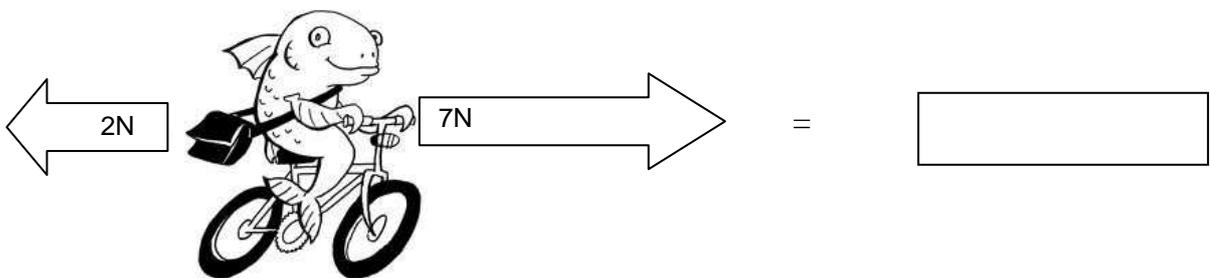
2a) Complete the following sentences.

- i) A force is used to make objects \_\_\_\_\_ . (1)
- ii) An example of a force is \_\_\_\_\_ . (1)

b) Write down the name of the following forces. (5)

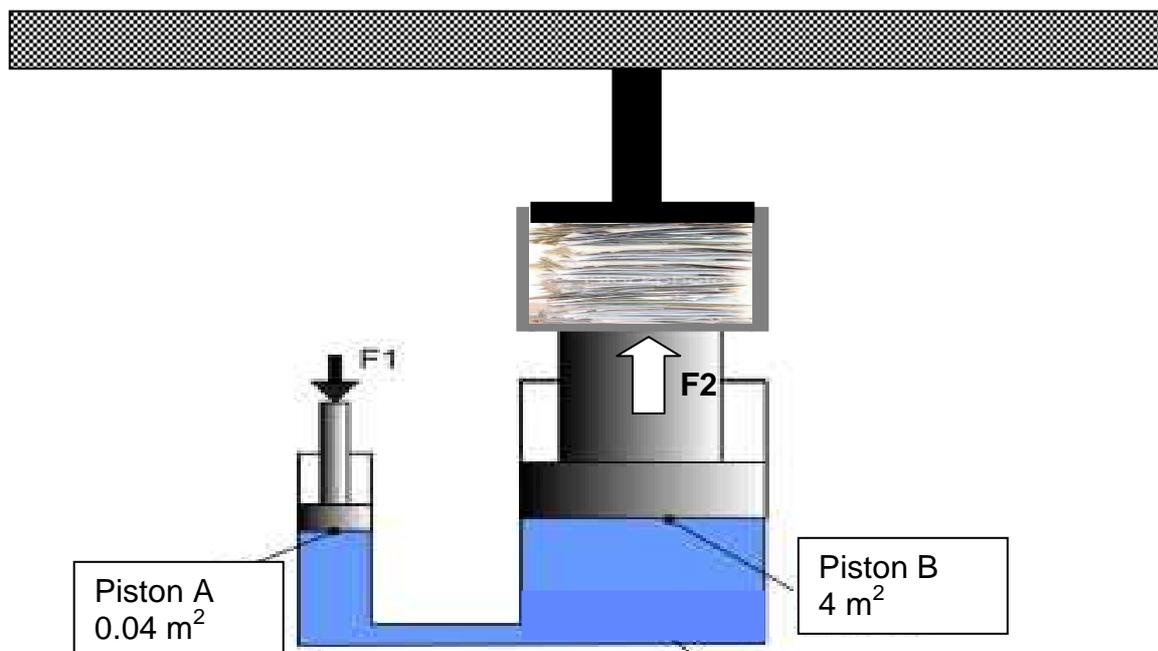


c) Work out the resultant force in the following cases. Indicate the direction.



(1,2)

3)



This is a paper recycling plant which uses a hydraulic machine to press paper for recycling. When piston A is pressed, Piston B moves up and paper is crushed.

a) What liquid is used in such a hydraulic machine?

\_\_\_\_\_ (1)

b) Mention one advantage of using a hydraulic machine.

\_\_\_\_\_ (2)

c) A load of 1 kg is placed on top of piston A. Work out the force (in N) this load produces.

\_\_\_\_\_ (1)

d) Therefore calculate the pressure exerted by this piston.

\_\_\_\_\_ (2)

e) What is the pressure at piston B? Give a reason for your answer.

\_\_\_\_\_ (2)

f) Now calculate the force with which piston B pushes on the paper.

\_\_\_\_\_ (2)

4) Fill in the blanks.

- a) Energy sources which can be used over and over again are called \_\_\_\_\_ sources. Two examples of this source are \_\_\_\_\_ and \_\_\_\_\_.
- b) Energy sources which can be used only once are called \_\_\_\_\_ sources. Two examples are \_\_\_\_\_ and \_\_\_\_\_. (6)
- c) Write one energy source you stated above and mention **one** advantage and **one** disadvantage.

Energy Source	Advantage	Disadvantage

(2)

- d) Suggest **two** measures you can take in the house to reduce loss of electrical energy in the home.

\_\_\_\_\_

\_\_\_\_\_ (2)

- 5) A dam is a wall built in a power station to generate electricity using water from rivers.

The density of water is  $1000 \text{ kg/m}^3$ .

- a) Making sure you write down the correct units, calculate the pressure due to the water at:

- i) point A; 50m below the surface.

\_\_\_\_\_

\_\_\_\_\_ (2)

- ii) point B; 1m below the surface.

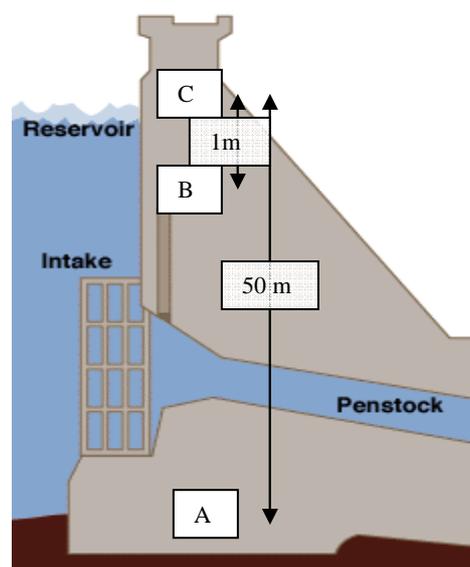
\_\_\_\_\_

\_\_\_\_\_ (2)

- b) With reference to the above answers; explain why the wall is thicker at the bottom than at the top.

\_\_\_\_\_ (2)

- c) What is the pressure at C called? \_\_\_\_\_ (1)



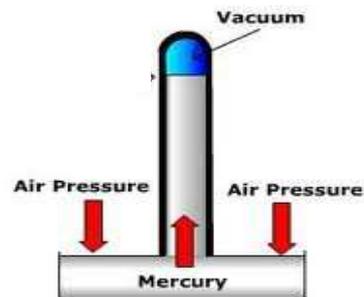
d) ii) What is this apparatus called?

\_\_\_\_\_ (1)

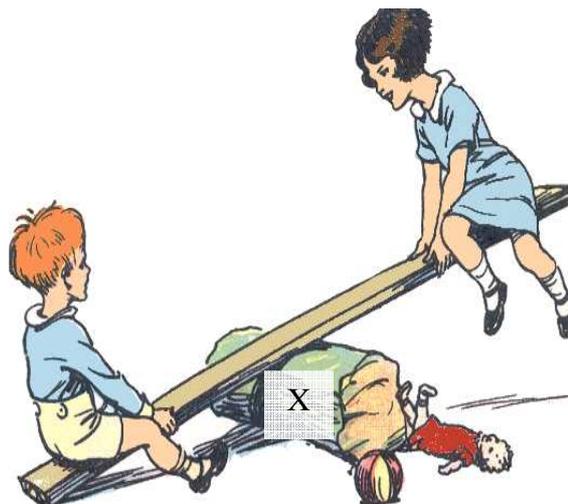
ii) This apparatus is taken up on a hill, what happens to the mercury level? Explain.

\_\_\_\_\_

\_\_\_\_\_ (2)



6) Manuel and Chiara were playing on the seesaw in the playground. Manuel's weight is 300N while that of Chiara is 250N. They both sit 1.5m away from X.



a) What is object X called?

\_\_\_\_\_ (1)

b i) On the diagram, mark the **clockwise moments (C)** and **anti-clockwise moments (A)**. (1)

ii) Work out the clockwise moments.

\_\_\_\_\_ (2)

iii) Work out the anti-clockwise moments.

\_\_\_\_\_ (2)

iv) In which direction will the seesaw turn?

\_\_\_\_\_ (1)

c) i) One of them moves towards the centre to make the seesaw balance. Who needs to move?

\_\_\_\_\_ (1)

ii) At what distance from X should she sit?

\_\_\_\_\_ (2)

## Section B

7) Jessica and Melanie are conducting an experiment to find the density of three rectangular blocks of different material.

a) Describe briefly the experiment they need to conduct.

\_\_\_\_\_ (2)

b) The following table shows some of the results they obtained.

Block	Mass (g)	Length (cm)	Breadth (cm)	Height (cm)	Volume (_____)	Density (_____)
A	480	5	3	4		
B	25.2	6	2	3		
C	3	4	2	3		

i) Write down the units of **volume** and **density** in the above table. (2)

ii) Fill in the rest of the table. Use the space below for necessary working.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_ (6)

ci) Which blocks would float on water? Remember that the density of water is  $1 \text{ g/cm}^3$ .

\_\_\_\_\_ (2)

ii) Explain why you have chosen these materials.

\_\_\_\_\_  
 \_\_\_\_\_ (2)

d) Which block is made of iron?

\_\_\_\_\_ (1)

- 8) Daniel and Martina set up an experiment to study how a spring stretches when loaded with different loads.
- a) **Draw and label** the setup of apparatus.

(3)

- b) These are the readings they collected.

Load (N)	0	1	2	3	4	5	6
Extension (cm)	0	2	4	6	8	10	12

- i) Plot a graph of **extension (y-axis)** against **load (x-axis)**. (5)
- ii) From your graph, find:

the extension of the spring when the load is 3.5N \_\_\_\_\_ (1)

the load when the extension is 11cm \_\_\_\_\_ (1)

- c) Fill in the blanks using the following words.

**directly proportional**                      **permanent**                      **straight**                      **inversely proportional**  
**elastic limit**                      **Hook's law**                      **extension**

The shape of the graph is a \_\_\_\_\_ line. This means that the extension and the load are \_\_\_\_\_. So the spring obeys \_\_\_\_\_. Daniel and Martina put a load of 8N on their spring and notice that the extension increases a lot. We say that the spring has exceeded its \_\_\_\_\_ and will have a \_\_\_\_\_ extension. (5)