



**St. Ignatius College**  
**Boys Secondary School, Handaq**  
**Half-Yearly Examination 2012**

1

**Form 4 (Track1)**

**Physics**

**Time: 1 hour 30 minutes**

**Name:** \_\_\_\_\_

**Class:** \_\_\_\_\_

1	2	3	4	5	6	7	8	9	Main	Course work	Oral	Global

Where necessary take the acceleration due to gravity to be  $10\text{m/s}^2$ .

**Useful equations:**

**Pressure = Force / Area    Pressure = height x density x gravity**

Answer **ALL** questions in the space provided. **ALL** working must be shown. The use of a calculator is allowed.

**1. This Question is about forces:**

Fill in the boxes in the diagram below using the following forces:


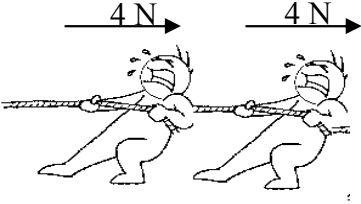

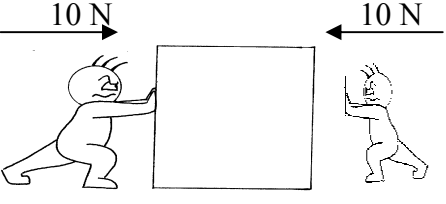
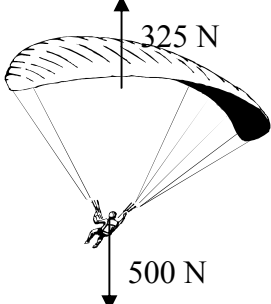
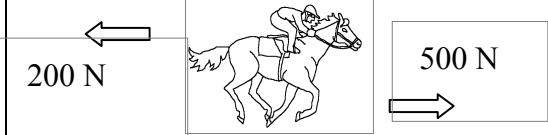
**Friction      Air Resistance      Weight      Tension**

(7 marks)

	<div style="border: 1px solid black; padding: 5px; text-align: center;">F.</div>
	<div style="border: 1px solid black; padding: 5px; text-align: center;">G.</div>

**2. This question is about addition of forces**

Work out the following Resultant force for the following forces. The first one is worked out for you as an example:

	Forces	Working
A		<p>Example:</p> $\text{Resultant Force} = 2000 - 500$ $= 1500 \text{ N}$
		
C		
D		
E		
F		

(5 marks – 1 mark each)

### 3. This question is about Pressure

Multiple Choice: UNDERLINE the correct answer

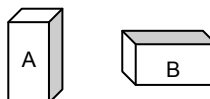
- Which one of these has the smallest pressure?
  - a knife blade
  - a stand with a large base
  - the blades of ice skates
- Which statement is NOT true?
  - the pressure in water acts in all directions
  - the lower part of a dam must be narrow because of the low pressure
  - the pressure is very high at the bottom
- Which of these makes the smallest pressure?
  - drawing pin
  - feet of a camel
  - syringe needle
- A force of a solid on a particular area is called:
  - Pressure
  - Mass
  - Weight
- What happens to the pressure of the sea on a diver as he goes up the water?
  - decreases
  - stays the same
  - increases



- Which part of a pin has the largest pressure?
  - the pointed end
  - the large flat part where the finger pushes
  - they have the same pressure
- A force of 100 Newtons on an area of  $2 \text{ m}^2$  is:
  - 200 Pascals
  - 100 Pascals
  - 50 Pascals



- Which of the two identical blocks is exerting the greatest pressure on the table?
  - the one standing on its smaller end
  - the one laying on the larger side
  - both exert the same pressure



- A 12 Newton force acting on an area of  $3 \text{ m}^2$  exerts a pressure of:
  - 4 Pascals
  - 36 Pascals
  - 9 Pascals

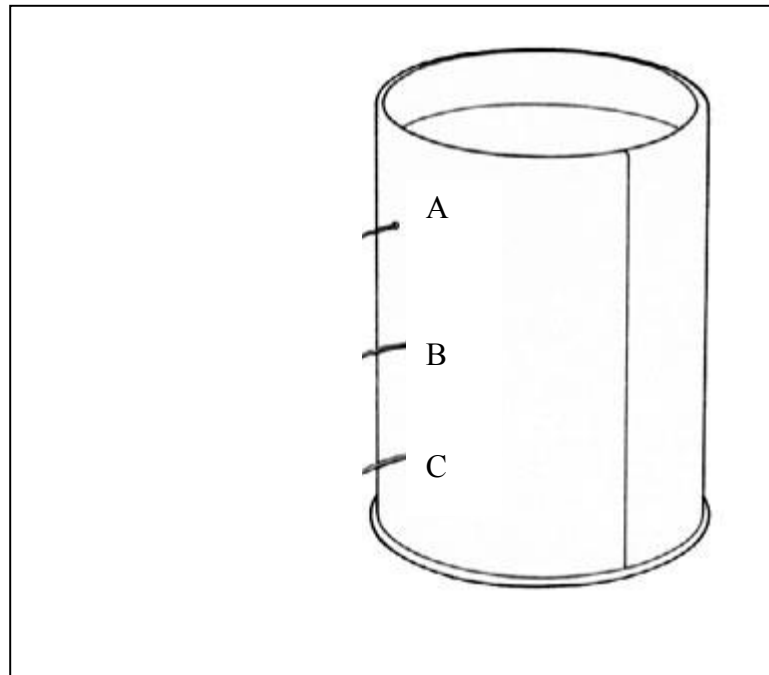
- What is the pressure of a man who is making a force of 500 N on an area of  $0.02 \text{ m}^2$ ?
  - 50000 Pascals
  - 25000 Pascals
  - 5 Pascals



(1 mark each - 10 marks)

**4. This question is about pressure in liquids**

a) This can is full of water with three holes drilled at one side. Complete the diagram. (3 marks)



b) From which hole does the water comes out with the greatest pressure?

*Please underline the right answer.*

(hole A, hole B, hole C)

(1 mark)

c) Explain your answer.

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(2 marks)

**5. This question is about pressure**

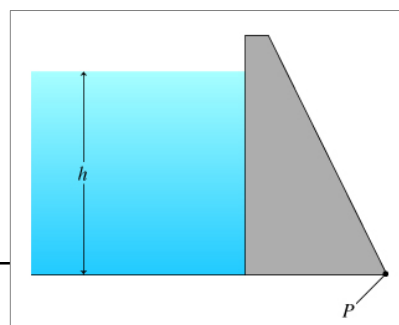
Answer the following questions:

a) Why is a dam thicker at its base than at its top?

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(2 marks)



b) Why does a tractor have wide tyres?

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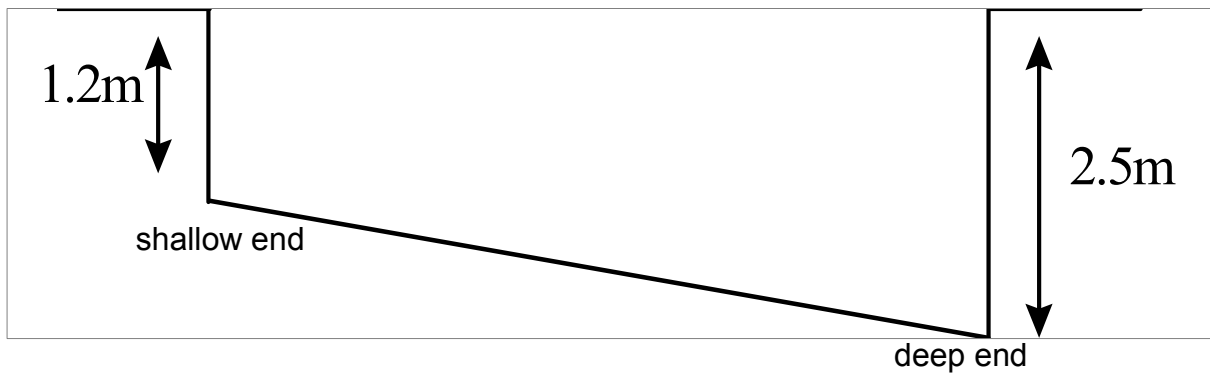
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(2 marks)



6. This question is about pressure in liquids.

Here there a cross-section view of a swimming pool. The density of water =  $1000\text{kg/m}^3$ .  
(Hint: Use the formula: **Pressure = height x density x gravity**)



a) Find the pressure at the shallow end.

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(2 marks)

b) Find the pressure at the deep end.

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(2 marks)

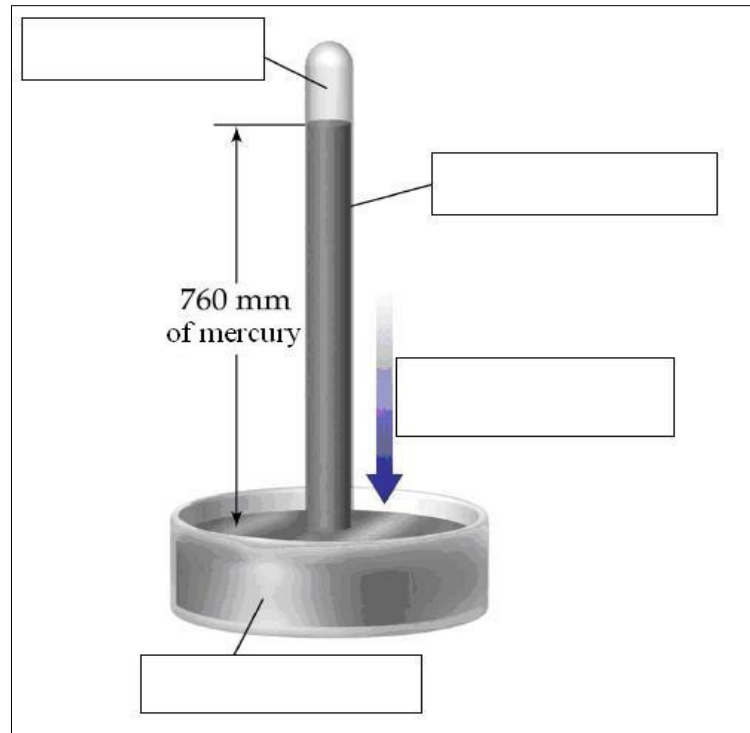
c) Which end has the higher pressure? What do you observe from your answer?

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(2 marks)

7. This question is about air pressure.



Underline the right answers for part a) and part b):

a) This instrument is called (altometer, mercury barometer, gravimeter) (1 mark)

b) This instrument is used to measure: (atmospheric pressure, rain, gravity) (1 mark)

c) Fill in with the right word the empty boxes on the diagram above:

**MERCURY    ATMOSPHERIC PRESSURE    VACUUM    GLASS TUBE**

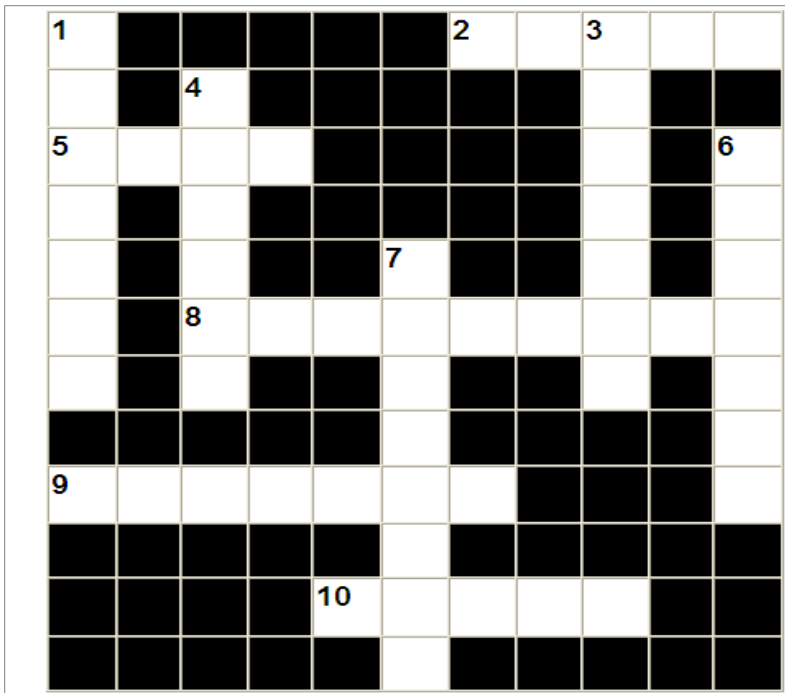
(4 marks)

d) She finds that at point A the height of mercury is 0.760 m. She knows that the density of mercury is  $13600 \text{ kg/m}^3$ . Use the equation **Pressure = height x density x gravity** to calculate the value of atmospheric pressure. (gravity =  $10 \text{ N/kg}$ )

(2 marks)

8. Complete the crossword by answering the questions below.

(Choose your answers from the box below)



**Across:**

2 Pressure in liquid increases with \_\_\_\_\_.

5 A small \_\_\_\_\_ makes a large pressure.

8 Modern car breaks uses a \_\_\_\_\_ system

9 The pressure in liquids depends on the \_\_\_\_\_ of the liquid.

10 A greater \_\_\_\_\_ on a pin increases the pressure.

**Down:**

1 Atmospheric pressure changes when \_\_\_\_\_ changes.

3 We measure pressure in \_\_\_\_\_.

4 \_\_\_\_\_ is a force that depends of gravity.

6 A \_\_\_\_\_ barometer has a height of 760mm of a type of liquid here on Earth.

7 \_\_\_\_\_ gives a tyre grip on the road when the driver applies the brake.

**Choose your answers from the following words:**

- |          |          |         |           |       |          |
|----------|----------|---------|-----------|-------|----------|
| friction | pressure | pascals | solids    | mass  | mercury, |
| weight   | brakes   | liquids | weather   | force | density  |
| depth    | area     | gravity | hydraulic | speed | distance |

(10 marks)

**9. This question is about electricity**

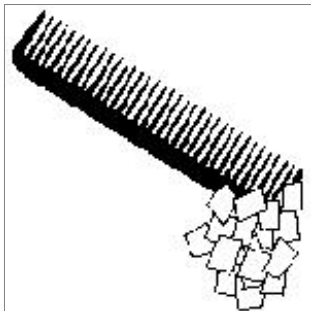
A. Considering the following materials. Put these materials in the table below to distinguish between conductors and insulators of electricity.

wood                  iron                  steel                  rubber                  plastic                  copper

Conductors	Insulators

(3 marks)

B. Look at this diagrams below:



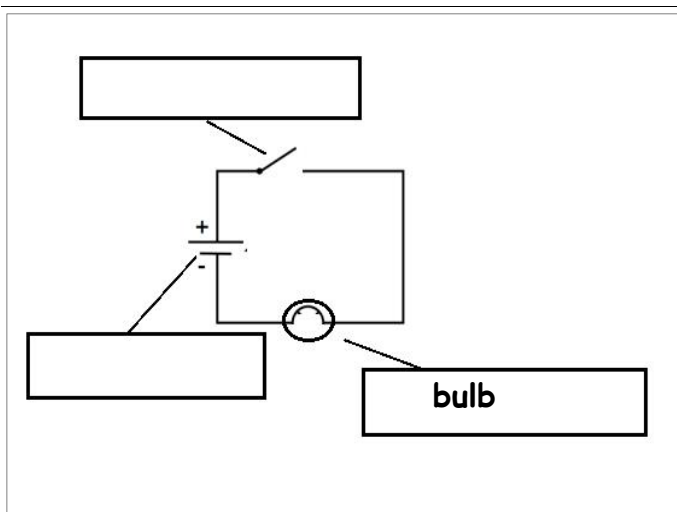
i) Can you explain how can small pieces of paper can be attracted by a plastic comb?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(2 marks)



ii) Label the circuit on the diagram left by filling the two empty boxes. (2 marks)

iii) Is the bulb on the diagram actually switched on? Yes or No (1 mark)

iv) Give reason for your answer above. (1 mark)

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