**NAME:……INDEX ……..…..DATE……..…**

**SCHOOL:……SIGNATURE……**

232/1
PHYSICS
PAPER1
JULY / AUGUST, 2010
2 HOURS

# KISUMU NORTH AND EAST DISTRICTS JOINT TEST
# Kenya Certificate of Secondary Education 2010

232/1
PHYSICS
PAPER1
JULY / AUGUST 2010

## INSTRUCTIONS TO CANDIDATES

- *Answer all questions in the spaces provided.*
- *Marks will be awarded for clear work.*
- *Attempt **ALL** questions in sections A and B. (Take $g = 10ms^{-2}$)*
- *All your answers must be written in the spaces provided in this question paper.*

**For Examiner's Use Only**

| Section | Question | Maximum Score | Candidates' Score |
|---|---|---|---|
| A | Q1 – Q15 | 25 | |
| B | Q16 | 12 | |
| | Q17 | 12 | |
| | Q18 | 12 | |
| | Q19 | 15 | |
| | Q20 | 5 | |
| | | 80 | |

## SECTION A (25 MARKS)

1. State **one** factor that affects pressure in liquids (1mk)

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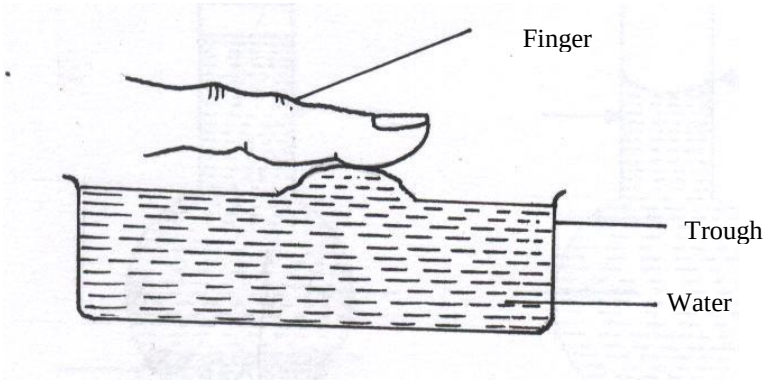
2. Anyango placed her finger on a water as shown in the diagram below




**Name** the force that lifts the water to the finger (1mk)

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3. In an experiment to measure the radius of a wire a student cut the wire into 100 identical pieces of length 7mm and dipped the pieces completely into a burette with initial level of liquid at $49.5cm^3$ mark. If the final level was at $0cm^3$. Determine the radius of the wire giving your answer to two decimal places (3mks)

4. **State** Newton's Second Law of Motion (1mk)

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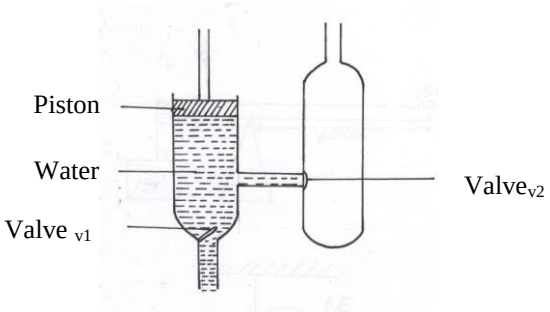
5. The figure below shows a force pump




**Explain** how the water gets past valve $V_2$ (2mks)

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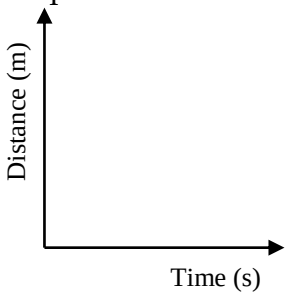
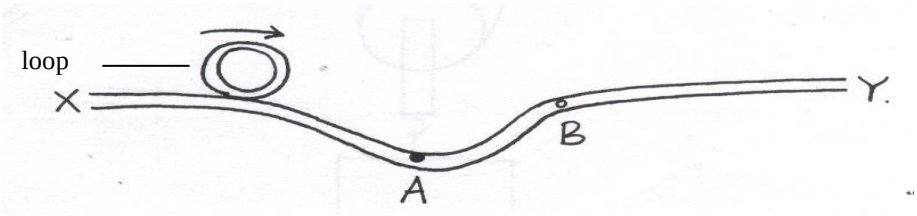
6. On the axes below, sketch a distance-time graph for a body which is accelerated uniformly from a fixed point (1mk)




7. A loop is traveling along a bumpy road XY




**State** its state of equilibrium at the point marked A. (1mks)

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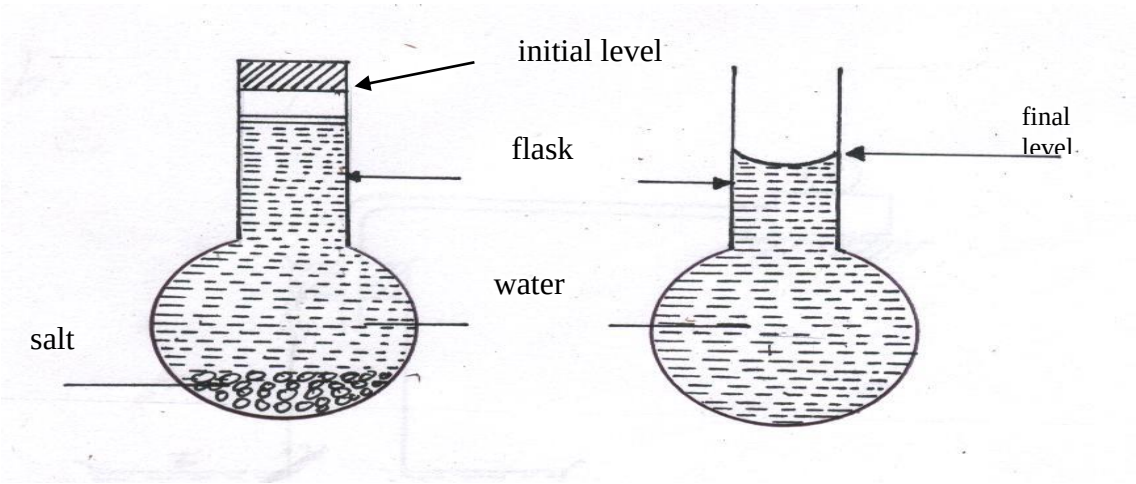
8. Water was added to fill a flask containing some mass of salt. The container was sealed with a coke and shaken thoroughly to dissolve the salt. It was noticed that the level of the liquid dropped.




**Explain** the observation made above (1mk)

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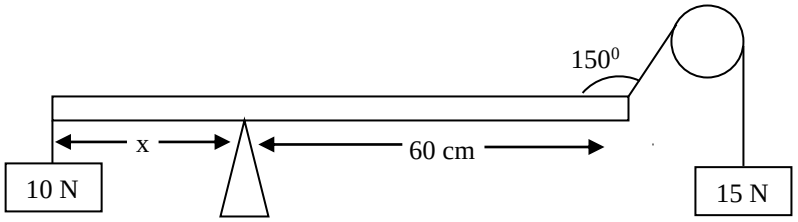
9. An object of weight 10N is dragged along an inclined plane of length 50m. The object was raised trough a vertical height of 30m. Calculate the gain in gravitation potential energy (2mks)

10. The bar in the figure below is uniform and has negligible weight.




If the system is in equilibrium, determine the value of x (3mks)

11. A body moving in a circular path is always accelerating. Explain. (1mk)

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12. State two factors that affect the centripetal force of a body moving in circular motion (2mks)

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13. A cuboid has dimensions 12cm by 10cm by 15cm. its weight is 72N. Determine the density of the material the cuboid is made of. Express your answer in kg/m$^3$.

(3mks)

14. **State** the law of Conservation of Momentum (1mk)

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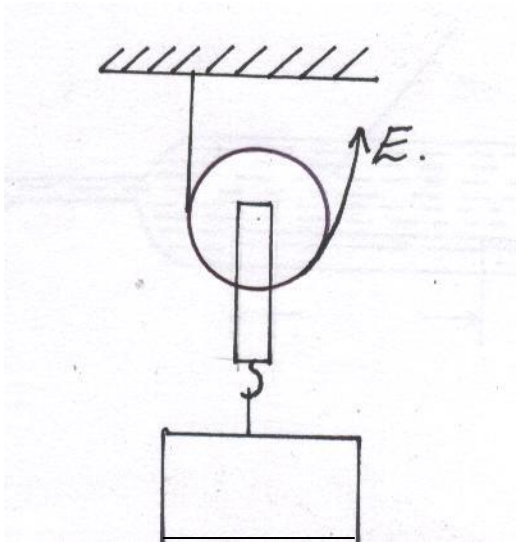
15. The figure below shows a single fixed pulley being used to lift a load.




**State**;

(i) The mechanical advantage of the pulley (1mk)

(ii) The velocity ration of the pulley (1mk)

## SECTION B (55 MARKS)

16. (a) State Hooke's law (1mk)

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(b)

(i) Define the term **Spring Constant** (1mk)

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(ii) (ii) State <u>two</u> factors that determine spring constant (2mks)

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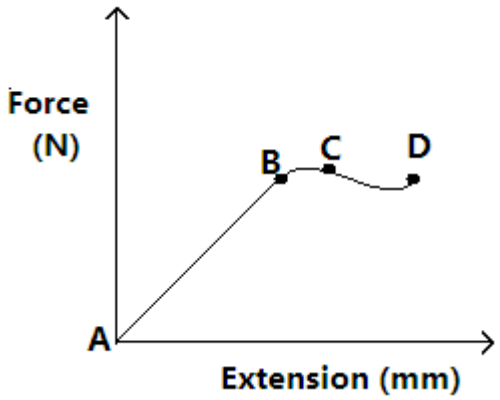
(iii) The graph in the figure below was obtained when suitable weights were suspended from a spiral spring and extensions measured




Explain the shape of the graph between

(i) AB

(ii) CD

(c) Two identical spiral springs are then arranged in parallel and the weights suspended. on the same axes above, sketch the graph that would now be obtained (2mks)

(d) The pointer of an unloaded spring reads 32 cm. when a mass of 120g is applied to the spring, the pointer reads 38cm. a pan in which a mass of 210g is placed is now hang from the spring and the pointer reads 48cm. determine the mass of the pan. (4mks)

17. (a) Distinguish between **heat** and **temperature** (1mk)

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(b) Define specific heat capacity (1mk)

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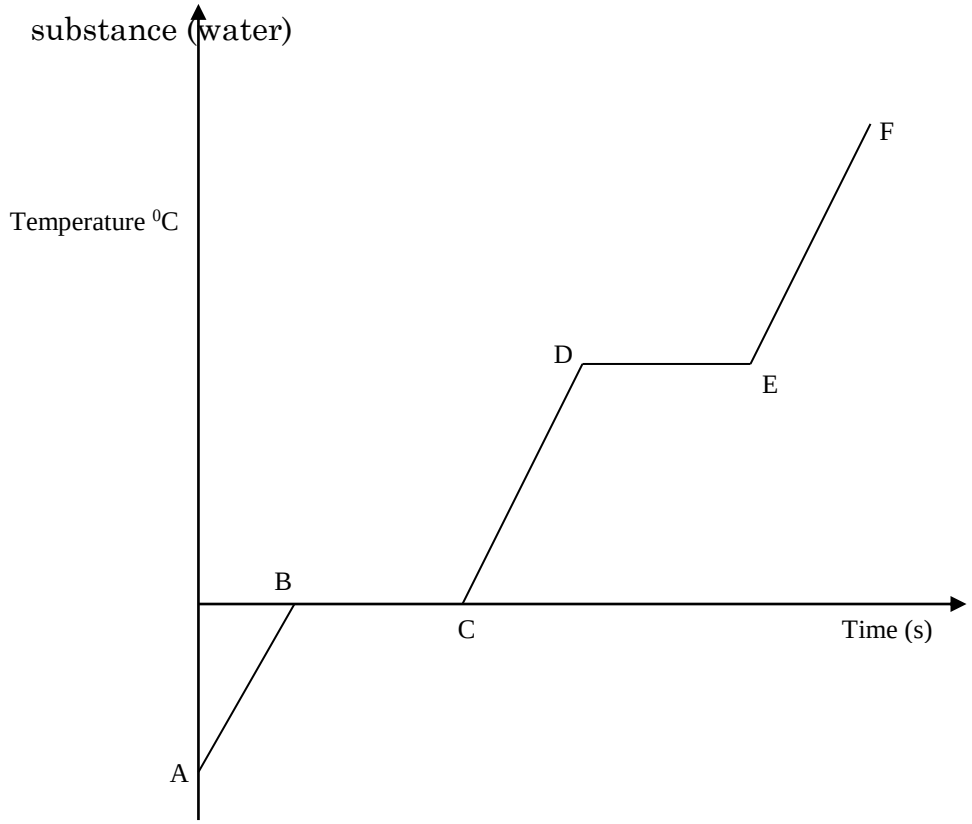
(c) The figure below shows a graph of temperature against time for a given substance (water)




State what happens in the section labelled

(i) BC (1mk)

(ii) CD (1mk)

(iii) DE (1mk)

(d) A hot-water tank for a house contains 150kg of water at $15^0$C. the tank itself has a heat capacity of 6000 $JK^{-1}$. an immersion heater is used to heat the water to $50^0$c. the tank is well insulated and the power of the heater is 2500W (specific heat capacity of water =4200 $JKg^{-1}K^{-1}$

(i) Find the amount of heat transferred to the water (2mks)

(ii) find how much heat is absorbed by the tank (2mks)

(iii) Determine the time it will take the heater to raise temperature to $50^0$C. (3mks)

18. (a) **State** Charles' law (1mk)

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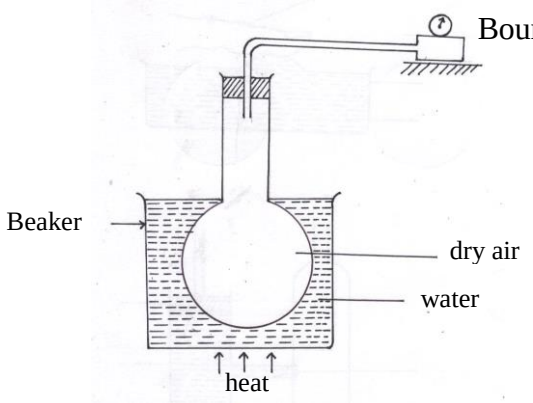
(b) The figure below shows a set up being used to investigate a gas law.




(i) Name one other apparatus essential for the reading to be taken (1mk)

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(ii) State one method of drying the gas (1mk)

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(iii) Explain **two** changes taking place with the gas particles in the container (2mks)

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(iv) **State** the gas law under investigation (1mk)

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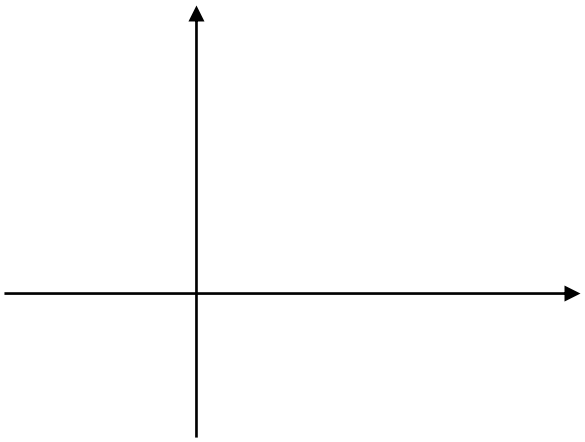
(v) In the axes below, sketch a graph that is obtainable from the experiment above. (2mks)



(c) A container holds $80cm^3$ of air. the pressure is 100 K Pa and the temperature $7.5^0C$. What is the final pressure when the air is compressed to $30cm^3$ and the temperature is $29^0C$ (3mks)

19. (a) **State** Archimede's principle (1mk)

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(b) A cork and a stone are both held under water and released at the same time.

(i) State the observation that would be made (1mk)

(ii) Explain the observation above (1mk)

(c) A wooden block measures 2cm by 5cm by 10cm floats in water with its length vertical. if three quarters of its length is submerged, determine;

(i) The density of the block (3mks)

(ii) The volume of the block remaining above the surface when floating in a liquid of density 800kgm$^{-3}$ (3mks)

(d) In an experiment to determine the relative density of methylated spirit by applying Archemedes principle, the follwing results were obtained.

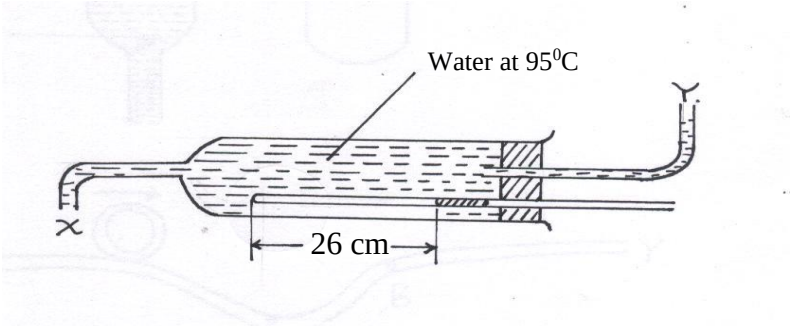
| Mass (g) | 100 | 150 | 200 |
|---|---|---|---|
| Weight in air (N) | 1.00 | 1.50 | 2.0 |
| Weight in water (N) | 0.88 | 1.32 | 1.76 |
| Apparent loss in weight (N) | | | |
| Weight in methylated spirit (N) | 0.91 | 1.36 | 1.82 |
| Apparent loss in weight (N) | | | |

(i) Fill in the blank spaces in the table (2mks)

(ii) On the same axes, plot a graph of upthrust (y-axis) against weight in water; for both water and methylated spirit (2mks)

(iii) Determine the gradient of each;stating the significance of the gradients. (2mks)

20. Oxygen is trapped in the horizontal tube AB closed at A and open at B by a column of mercury C. the temperature of the tube is controlled by circulating water round the outer jacket.




a) Why is the end B of the tube open? (1mks)

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b) State what difference it will make if the experiment were perfomed with the capillary tube vertical. Explain. (2mks)

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c) What would be the change in reading of oxygen column if the tube is held vertically while maintaied at the same temperature? Explain your answer (2mks)

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