Name ..... **Index Number** ..... / .....

School ..... **Candidate's Signature** .....

Date .....

232/1

PHYSICS

PAPER 1

(THEORY)

JULY/AUGUST 2013

TIME: 2HOURS

LENOCET EVALUATION TEST

KENYA CERTIFICATE OF SECONDARY EDUCATION

PHYSICS

PAPER 1

TIME: 2HOURS

Instructions to candidates

a) Write your **Name, School** and **Index Number** in the spaces provided above.
b) **Sign** and **write** the date of examination in the spaces provided above.
c) This paper consists of **two** sections: **A** and **B**.
d) Answer **ALL** the questions in section **A** and **B** in the spaces provided.
e) All working must be clearly shown.
f) Non programmable silent electronic calculators **may be** used.
g) This paper consists of 12 printed pages.
Where necessary take g = 10N/Kg, density of water = $1g/cm^3$

For Examiner's use only

Section	Question	Maximum Score	Candidate's Score
A	1 - 14	25	
B	15	11	
	16	09	
	17	10	
	18	13	
	19	12	
Total Score		**80**	

SECTION A: 25 MARKS

Answer all questions in this section in the spaces provided

1. (a) Other than lowering the temperature state any other factor that raises the surface tension of a liquid. (1mark)

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(b) A pail of mortar weighs 60N on earth where acceleration due to gravity is 10N/kg. The moon has gravitational acceleration $^1/_6$ times that on earth. How many newtons will the mortar weigh on the moon? (2marks)

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2. Figure 1 below shows a U-tube containing oil of light density in equilibrium.

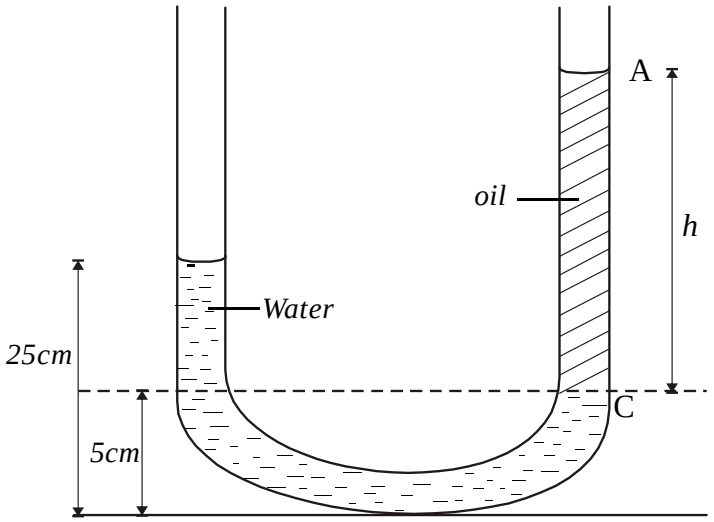

Figure 1

Determine the height *h* of the oil column AC (density of oil is 600kg/m^3) (3marks)

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3. State two features that make the clinical thermometer to be more sensitive. (2marks)

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4. A white paper is wrapped round the junction of a copper and wooden rods which are joined together as shown in figure 2 below.

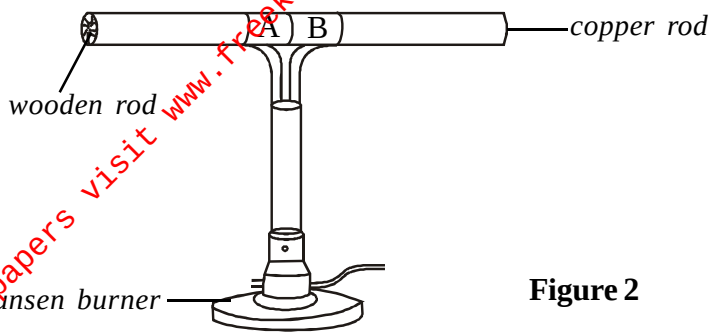

Figure 2

State and explain the part of the paper that got charred first. (2marks)

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5. A uniform metre rule is pivoted at its centre. A force of 65N is applied at a point which is 15cm from one end of the rule. What is the moment of the force? (2marks)

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6. In an experiment to demonstrate Brownian motion, smoke was placed in an air cell and observed through a microscope. State a reason for using small particles such as smoke particles in this experiment. (1mark)

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7. Figure 3 below shows a suspended plumb line.

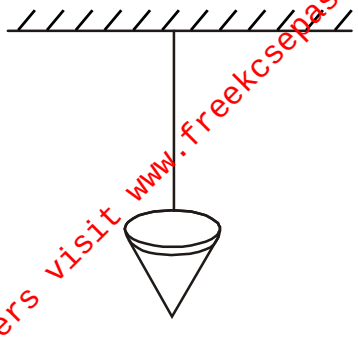

Figure 3

Name its state of equilibrium. (1mark)

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8. A student blew a gust of air into the horizontal straw in the direction shown in figure 4 below.

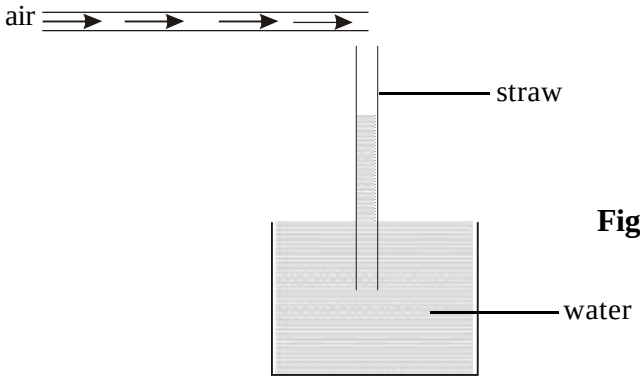

Figure 4

Explain what was observed in the vertical straw. (2marks)

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9. The figure 5 below shows an arrangement of identical springs each of length 6cm and spring constant of 4N/cm.

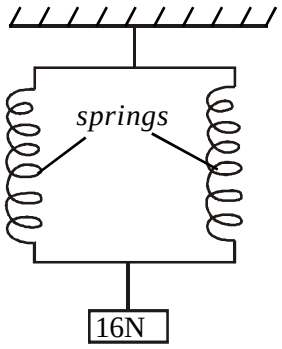

Figure 5

Determine the total extension of the arrangement when a weight of 16N is supended as shown above. (2marks)

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10. A body initially moving at 50m/s decreases uniformly at 4m/s until it comes to rest. What distance does it cover from the time it started to decelerate? (2 marks)

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11. State Newton's second Law of motion. (1mark)

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12. State one advantage of a circuit breaker over a fuse. (1mark)

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13. State how a gas exerts pressure? (1mark)

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14. A gas occupies 40.0ml at 127^0c. What volume will it occupy at -73^0c assuming that pressure and number of particles is constant. (2marks)

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SECTION B (55 MARKS)

(Answer all questions in the spaces provided)

15. (a) State the law of conservation of energy . (1mark)

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(b) A worker at a building site raises a mixture of sand and cement using a pulley system as shown in figure 6..

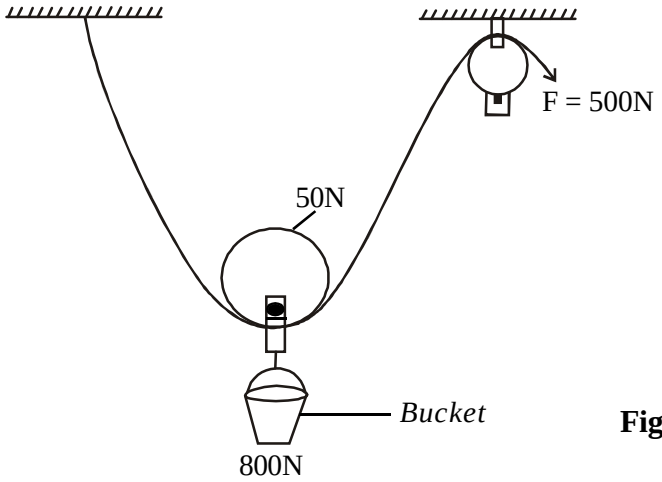

Figure 6

The worker applied a force of 500N for a distance of 6m. Given that the weight of the pulley was 50N. Find:-

(i) velocity ratio of the machine. (1mark)

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(ii) the load distance (2marks)

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(iii) the work done on the load (2marks)

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(iv) the efficiency of the machine (3marks)

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(v) Give two reasons why the efficiency of the machine can not be 100%. (2marks)

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16. (a) Define the term centripetal acceleration. (1mark)

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(b) Figure 7 shows an object of mass 0.2kg whirled in a vertical circle of radius 0.5m at a uniform speed of 5m/s.

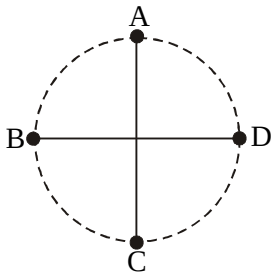

Figure 7

(i) Determine the tension in the string at

(i) position A (3marks)

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(ii) position B (3marks)

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(ii) At what point is the string likely to cut. Explain. (2marks)

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17. (a) (i) State the law of floatation. (1mark)

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(b) (ii) Explain why a hollow metal sphere floats on water while a solid metal sphere of the same material sinks in water. (2marks)

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(c) Figure 8 shows a uniform block of uniform cross-sectional area of 6.0cm^2 floating on two liquids A and B. The lengths of the block in each liquid are shown.

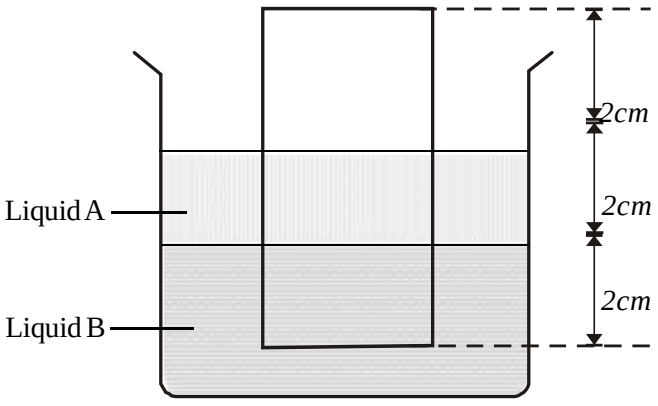

Figure 8

Given that the density of liquid A is 800kg/m^3 and that of liquid B is 1000kg/m^3 .
Determine the

(i) weight of liquid A displaced (1mark)

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(ii) weight of liquid B displaced (2marks)

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(iii) density of the block (2marks)

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18. (i) (a) Define the term heat capacity. (1mark)

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(b) Figure 9 shows a set up used in an experiment to determine the specific heat capacity of water.

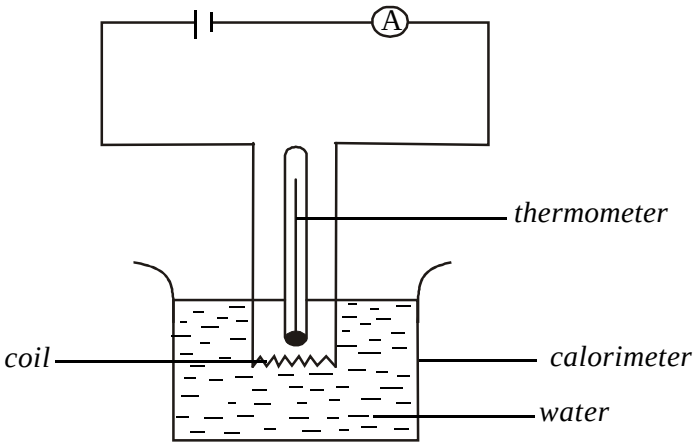

Figure 9

The data below was obtained from the experiment.

Current I in the circuit = 1.5A

Time for heating = 10min

Mass of water = 0.4kg

Change in temperature = 6^0c

Resistance of the coil = 8Ω

(i) Name the apparatus that might have been used in addition to the calorimeter. (2marks)

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(ii) Give two ways in which heat loss from the calorimeter might have been reduced in this experiment. (2marks)

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(iii) Explain why using a larger mass of the liquid while supplying the same amount of energy might have produced a less accurate result. (1mark)

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(iv) Using the above data, determine the specific heat capacity of water. (4marks)

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(v) State two assumptions you made while working out the answer in (iv) above (2marks)

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(c) A water fall 168m high has the temperature of water at its top as 18^0C.
Work out the temperature of water at the bottom of the water fall using the specific heat capacity of water in (iv) above. (3marks)

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19. (a) (i) Draw a scale of a micrometer screw gauge showing a reading of 5.87mm if its pitch is 0.5mm (1mark)

(ii) Given that the instrument in (i) above had a zero error of +0.21. State the actual reading from the arrangement given above. (1mark)

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(b) In an experiment to estimate the thickness of an oil molecule, lycopodium powder was sprinkled on water surface before an oil drop of volume $0.2cm^3$ was gently placed. An oil patch 10cm wide was formed.

(i) State two reasons why the powder was sprinkled on the surface. (2marks)

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(ii) Use the information to determine the thickness of one molecule of oil in the experiment. (3marks)

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(iii) Describe an experiment to determine the volume of an oil drop if you are provided with a burette, some oil and a measuring cylinder. (3marks)

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(iv) State two assumptions made in calculating the thickness of the oil molecule. (2marks)

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