Name: …… **Index No.** ……

School: …… **Candidate's Sign.** ……

Date: ……

232/1
PHYSICS
PAPER 1
Theory
JULY/AUGUST 2011
TIME: 2 HOURS

MUMIAS DISTRICT JOINT EVALUATION EXAM

Kenya Certificate of Secondary Education (K.C.S.E.)

Physics
Paper 1

INSTRUCTIONS TO CANDIDATES:

- *Write your **name and index number** in the spaces provided above.*
- *Answer **all** the questions both in section **A** and **B** in the spaces provided below each question*
- *All workings **must** be clearly shown; marks may be awarded for correct steps even if the answers are wrong.*
- *Mathematical tables and silent electronic calculators may be used.*
- *Take g= 10m/s^2*
- *Take Acceleration due to gravity, g=10ms^{-2}*
- *Density of water=1gcm^{-3}*

For Examiners' Use Only

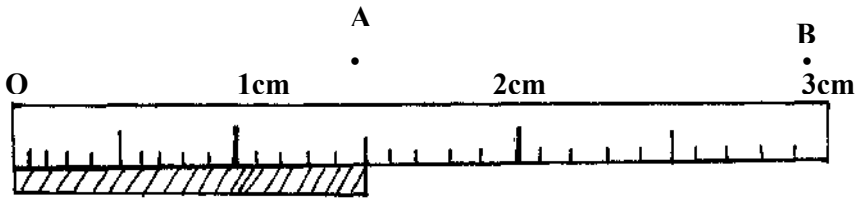
SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-11	25	
B	12	14	
	13	13	
	14	14	
	15	14	
TOTA L SCORE		80	

SECTION A (25 Marks)

Answer all questions in spaces provided

1. Figure 1 shows a millimeter scale placed in a position to measure the length of a block. An observer takes readings from position A and then from position B

Fig 1



State the difference in readings. (3mks)

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2. State **three** properties of a liquid that are considered when constructing a liquid-in glass thermometer. (3mks)

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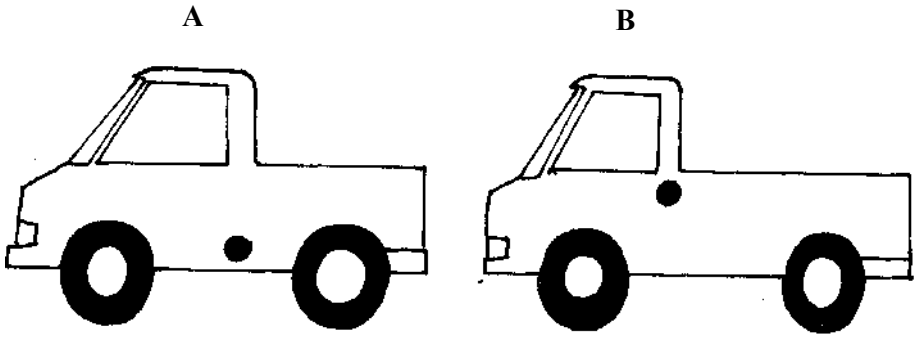
3. Two identical pick-ups A and B are loaded such that their centre of gravity is as shown in figure 2.

Fig 2



State with a reason which one of the pick-ups is more stable. (2mks)

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4. State Newton's first law of motion. (1mk)

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5. Explain why steel is selected for use to reinforce a concreter beam. (1mk)

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6. The height of mercury column in a barometer density 13600kg/ m^{-3}, at a place is 64cm. What would be the height of a column of paraffin in barometer at the same place.
(Density of paraffin = 8.0 x 10^2 kg /m^3). (3mks)

7. A body of mass **M** is allowed to slide down an inclined plane. State **two** factors that affect its final velocity at the bottom of the incline plane. (2mks)

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8. An object of mass, M is released from a height, h from a surface derive an expression for final velocity V. (3mks)

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9. How much work is done in stretching a spring of spring constant 25N/m when length is increased from 0.1 to 0.20m. (3mks)

10. A uniform plank 5m long and mass 10kg is supported on a Knife edge. Masses of weight 40kg, 20kg and x kg are suspended at distances 1m, 2m and 4m respectively from one end . The reaction at the support is 1000N. If the plank is at balance, determine the position of the support. (3mks)

11. Explain why tractors have wide tyres especially when used on earth roads. (1mk)

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SECTION B (55 MARKS)

Answer all the questions in this section in the spaces provided.

12. (a) Define velocity ratio. (1mk)

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(b) (i) In an experiment carried out to determine the efficiency of a pulley system it was found that when an effort of 80N was used to lift 300N the efficiency was 75% determine the effort applied to lift 80N when the efficiency of the same pulley system was 64%. (4mks)

(ii) Give a reason why efficiency varies with load. (1mk)

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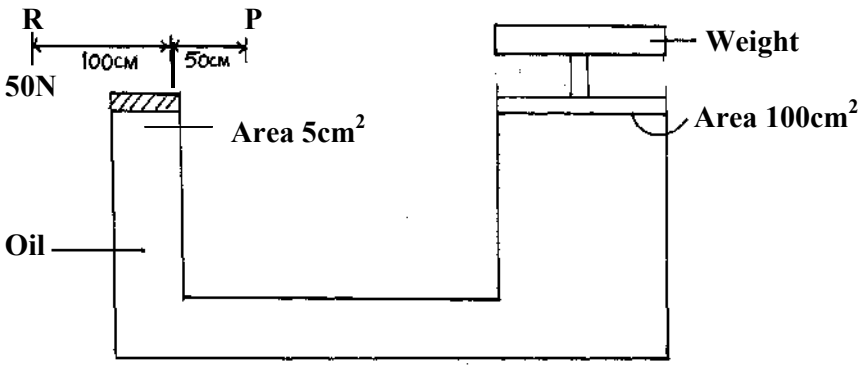
(c) The figure 3 shows hydraulic press system using a lever of negligible mass, on the ride of the small piston pivoted at a point P. A force of 50N is applied at R.

REDRAW DIAGRAM



Calculate

(i) Force exerted by small piston on the liquid. (2mks)

(ii) Pressure of liquid below the small piston. (3mks)

(iii) The weight of object supported on the larger piston. (3mks)

13. (a) Carbon dioxide is used to make fizzy drinks. It is stored in high pressure in cast iron cylinder Figure 4 below represents the particles in a cylinder of carbon dioxide.

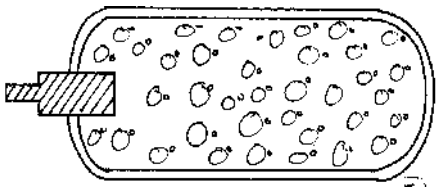


Fig 4

(i) Describe how the particles of carbon dioxide exert pressure. (3mks)

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(ii) The temperature of the gas in the cylinder is increased.

I. What effect does this have on the movement of the carbon dioxide particles? (1mk)

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II. Explain how this affects the pressure exerted by the gas. (1mk)

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III. The gas cylinder are painted black Explain why gas cylinder should not be stored outside in the direct sunlight. (2mks)

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(b) A weather balloon contains $100m^3$ of helium when atmospheric pressure is 90Kpa. If the atmosphere pressure changes to 100Kpa, calculate the new volume. (3mks)

(c) A boy wants to rescue someone who has fallen through ice pond. Would it be safer to walk or crawl across the ice towards him? Explain. (3mks)

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14. (a) Define impulse in terms of momentum. (1mk)

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(b) For a particle of mass m which is initially moving vertically downward with velocity U, obtain an expression for changes in kinetic energy after;

(i) It has moved freely under gravity for time t, (3mks)

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(ii) It has moved freely under gravity for a vertical distance S. (3mks)

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(c) A lead ball is placed on the surface of viscous oil and released.

(i) State the three forces acting on the ball as it falls through the oil. (3mks)

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(ii) State which forces varies during the fall and explain why the variation (2mks)

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(iii) What is meant by the term terminal velocity of the ball. (1mk)

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(iv) Sketch a graph showing the variation of the displacement of the ball with time from when it was released. (1mk)

15. (a) Define specific latent heat of vaporization. (1mk)

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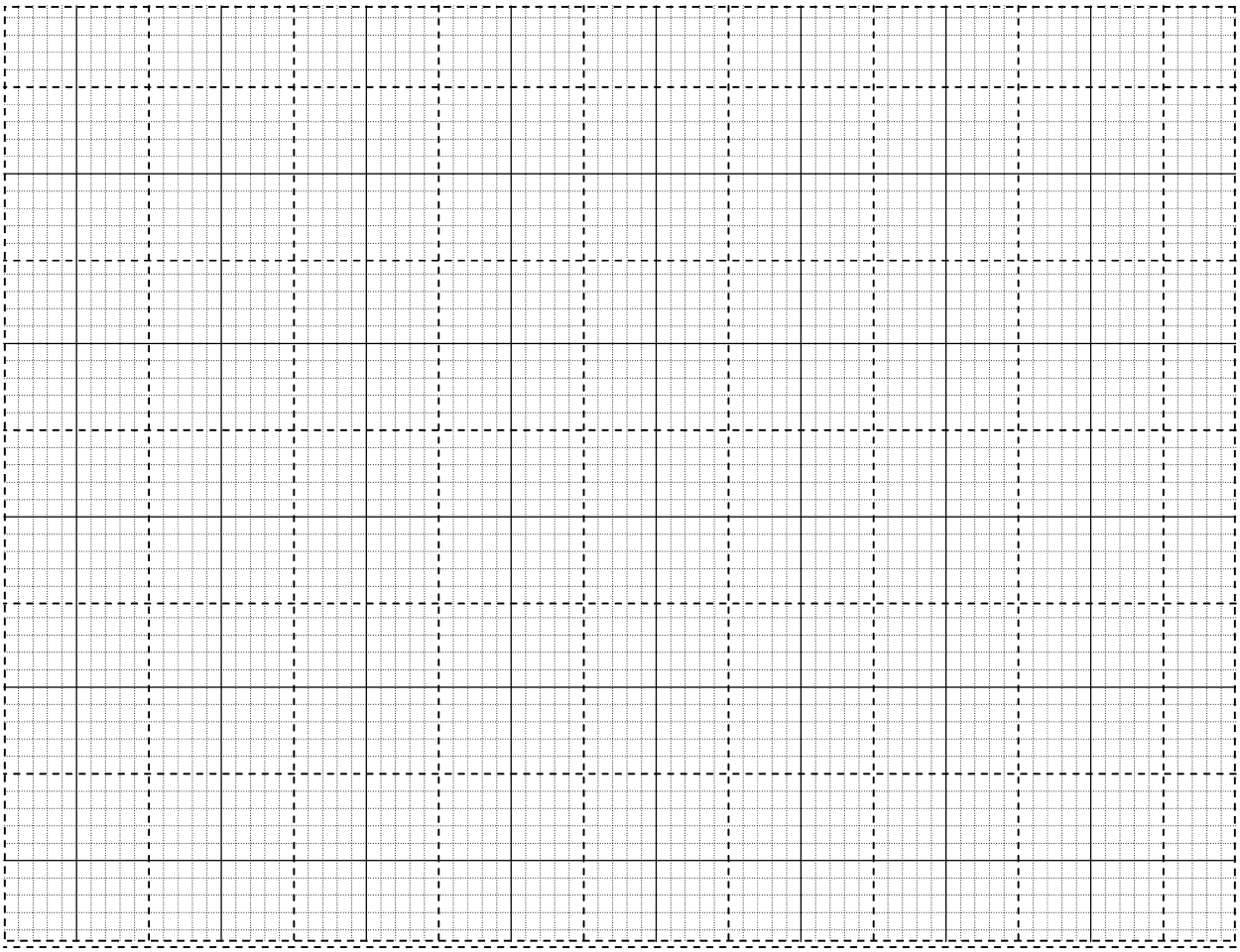
(b) In an experiment to determine the specific latent heat of vaporization of a liquid using an electrical method, the amount of heat, Q, required to vaporize a given mass, m, of a liquid were recorded as shown in table 2.

Q (J) X 10^3	3.0	4.0	5.0	6.0	7.0	8.0
M (kg) X10^{-3}	4.0	6.4	8.8	11.2	13.6	16.0

(i) On the grid provided plot a graph of Q (y-axis) against m. (5mks)



INSERT FULL GRAPH PAPER

(ii) From the graph, determine the specific latent heat of vaporization of the liquid. (3mks)

(iii) Suggest a reason why the graph does not pass through the origin. (1mk)

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(iv) Write a possible equation of this graph. (1mk)

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(c) Calculate the amount of heat required to melt 30g of ice at 0^{o}C. (Latent heat of fusion of ice is 3.34×10^{5} Jkg^{-1}). Give your answer correct to two decimal places. (3mks)