**NAME:……..……INDEX ……..…..DATE……..…….**

**SCHOOL:……..……SIGNATURE……**

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

# JOINT INTER-SCHOOLS EVALUATION TEST (JISET)
# Kenya Certificate of Secondary Education 2010

232/1
PHYSICS
PAPER1
JULY / AUGUST 2010

## INSTRUCTIONS TO CANDIDATES

- *Write your name and index number in the spaces provided above*
- *Sign and write the date of the examination in the spaces provided*
- *Attempt **ALL** questions in sections A and B.*
- *All your answers must be written in the spaces provided in this question paper.*
- *All working must be clearly shown*
- *Non programmable silent electronic calculators and KNEC mathematics table may be used except where state otherwise*

**For Examiner's Use Only**

| Section | Question | Maximum Score | Candidates' Score |
|---|---|---|---|
| A | Q1 – Q13 | 25 | |
| B | Q14 | 15 | |
| | Q15 | 09 | |
| | Q16 | 12 | |
| | Q17 | 09 | |
| | Q18 | 10 | |
| | | 80 | |

## SECTION A (25 MARKS)

1. State **two** quantities on which expansion on heating of a metal depends.(2 mks)

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2. Explain why gas cylinders are likely to expand incase of a fire out break(2 mks)

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3. A hammer is used to hit a round piece of lead into a flat shape. It is observed that the temperature of the piece of lead rises through several degrees. State the energy transformation. (2 mks)

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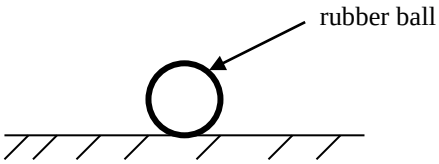
4. State the type of equilibrium for a rubber ball placed on a horizontal table

   (1 mk)

   Fig 1

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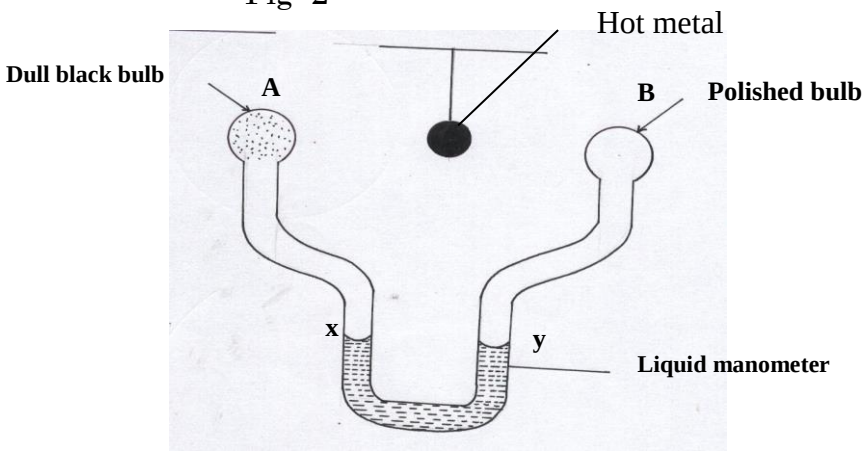
5. A ball is thrown vertically upwards and returns to its starting point after 6 seconds. Calculate the maximum height reached $\left(g = 10m/s^2\right)$ (3 mks)

The figure 2 below shows **two** glass bulbs A and B of the same size. Bulb A is painted dull black and a hot metal ball is placed equidistant from the two bulbs.

Fig 2




Use the information above to answer question 6, 7 and 8.

6. State and explain what will happen to the levels of the liquid after some time (2 mks)

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After the apparatus has cooled and the levels in X and Y are again equal, the hot ball is placed nearer to the polished bulb in such a position that there is no difference in the levels of X and Y although the bulbs are heated.

7. State and explain what will happen to the levels of the liquid in the manometer when the metal ball is removed (2 mks)

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8. State how the heat from the hot metal ball reaches bulb A and B (1 mk)

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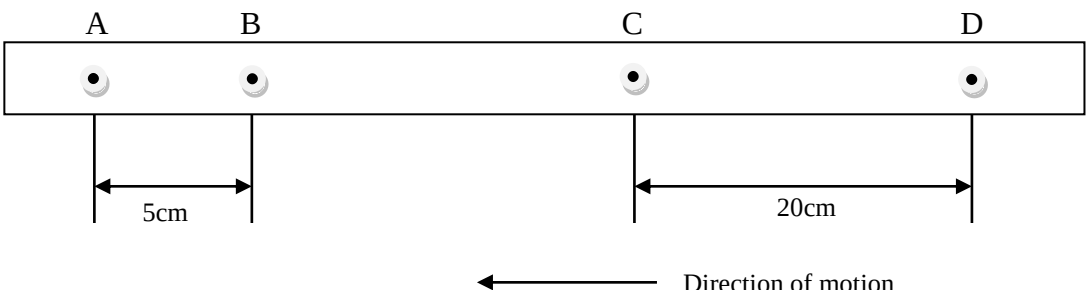
9. The graph in figure 3 below shows the force used to move an object through a distance of 10m.

Fig 3

Using the graph, determine the work done by the force (3 mks)

A tape is pulled steadily through a ticker timer of frequency 50Hz. The results are represented by the tape in the figure 4 below

Fig 4



Using the information above answer question 10 and 11

10. Determine the average velocity of the body pulling the tape between

    i) AB (1 mk)

    ii) CD (1 mk)

11. Determine the average acceleration of the body (3 mks)

12. The relative density of a solid is 2.4. Determine the up thrust it experiences when floating on water if the weight is 200N in air. (3 mks)

13. A column of air 24cm long is trapped by a column of mercury 10cm long in a horizontal tube with uniform cross-sectional area. If the atmospheric pressure is 76cm Hg. Determine the new height of air trapped in the tube when the tube is placed vertically. (3 mks)

## SECTION B (55 MARKS)

14. A body starts moving from rest and 10 seconds later it acquires a speed of 20m/s. It maintains a constant speed for 5 seconds. Finally the body undergoes uniform retardation to rest in 10 seconds

    a) Represent the motion graphically on the grid provided (3 mks)

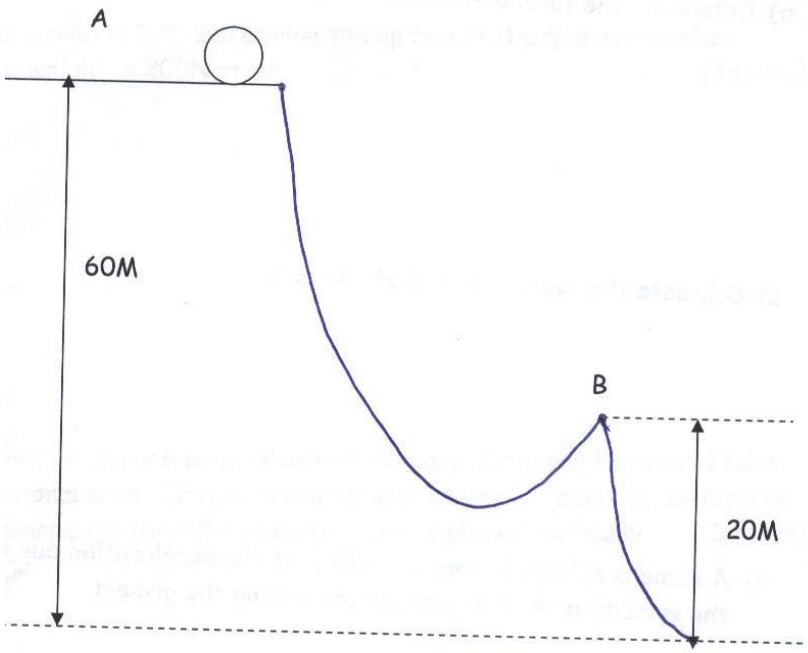
b) Determine the total distance covered (2 mks)

c) Calculate the average speed of the body (2 mks)

d) A stone is released from a height h, if the acceleration due to gravity is g, show that the velocity is v=2gh just before hitting the ground (2 mks)

e) The diagram in the figure 5 below shows a smooth path AB in a vertical plane of a rolling bag of sugar placed at A.

Fig 5



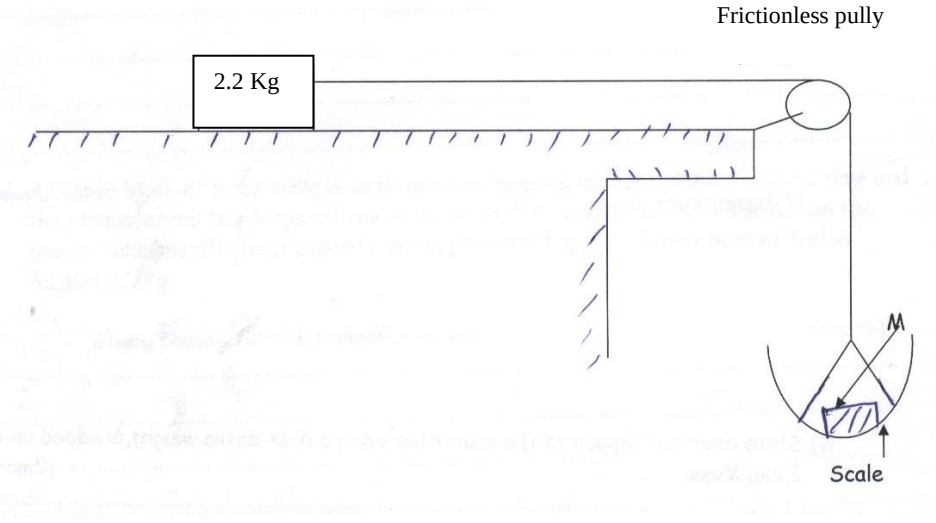

It moves from A to B and flies off at B.

i) If the mass of the bag is 100kg, calculate the change in its gravitation acceleration at potential energy between A and B (3 mks)

ii) Calculate the velocity of the bag at B if 80% of the potential energy becomes the kinetic energy. (3 mks)

15. a) In an experiment to determine the proportionality constant, $\mu$ between two wooden surfaces sliding on each other, a block of mass 2.20kg was placed on a horizontal bench. The block was then made to slide by adding mass M on the scale shown below. The experiment was repeated for other values of M. The acceleration of the block was measured for each mass added.

Fig 6




i) A graph of acceleration against mass M is as shown in figure 7 below

ii) Name and indicate the forces on the 2.20kg mass (2 mks)

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iii) Given that $a = \frac{mg}{2.20} - \mu g$,

1) From the graph determine, g (3 mks)

2) Determine $\mu$ (2 mks)

iv) State what will happen to the quantities $\mu$ and $a$ if an extra weight is added on the 2.2kg mass. (2 mks)

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v) State **two** factors that effect friction between solid surfaces (2 mks)

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16. a) State the **two** factors that affect the boiling point of water and in each case, explain how the boiling is affected. (4 mks)

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b) Distinguish between evaporation and boiling (2 mks)

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c) A copper block of mass 800g is suspended in a freezing mixture $-60^0C$ for some time and then transferred to a large volume of water at $0^0C$. A layer of ice is formed on the block. Take specific heat capacity of copper $=360JKg^{-1}K^{-1}$, latent heat of fusion $336,000JKg^{-1}$

i. Give a reason for the formation of ice (1 mk)

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ii. State the temperature of the copper block after this change is complete (2 mks)

iii. Determine the mass of ice formed (3 mks)

17. a) State the principle of moments (1 mk)

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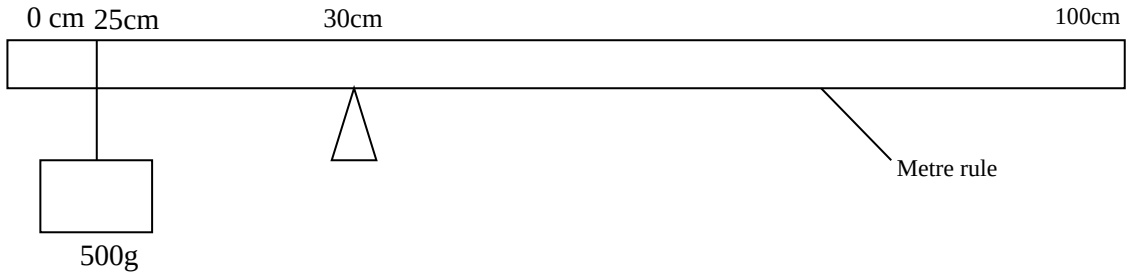
b) A metre rule whose centre of gravity is at the 50cm mark balances at the 35cm mark when a mass of 500g is placed at the 25cm mark as shown in the figure 8 below




i. Determine the mass of the metre rule (3 mks)

ii. With the metre rule remaining on the knife-edge at the 30 cm mark, a mass of 125g is suspended from the 70 cm mark. The mass of 500g is moved until the rule is balanced. Determine the new position of the 500g mass (3 mks)

iii. Describe the state of equilibrium of the metre rule, giving your reason (2 mks)

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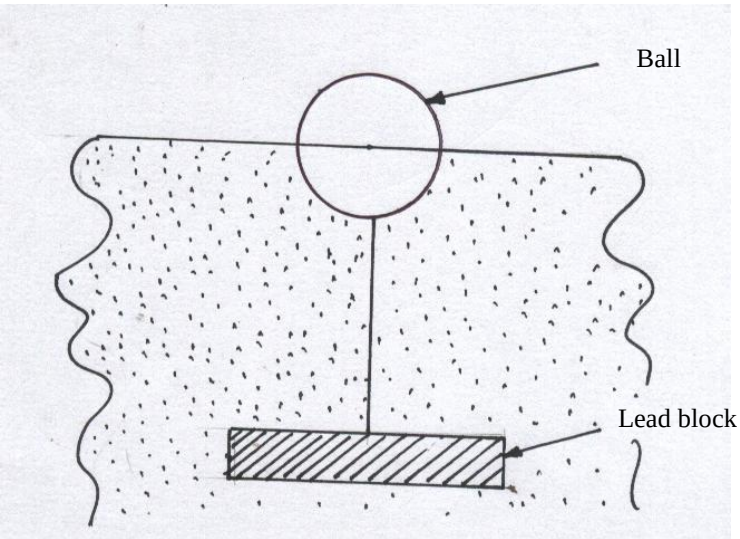
18. a) The figure 9 below shows a ball of 15kg and volume 0.06$m^3$ held in position in sea water held by a chain and block of lead. The density of the sea water is 1.04$gcm^{-3}$ and the ball is held half its volume below the surface of the sea water.

Fig 9




a) What volume of sea water is displaced by the ball? (1 mk)

b) Determine the weight of the chain and block of lead which keeps the ball in its position (2 mks)

c) If the ball becomes separated from the chain and floats by itself in sea water, what volume of the ball will submerge? (3 mks)

d) i) State **two** factors that determine the magnitude of centripetal force acting on a body moving uniformly in a circular path. (2 mks)

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ii) A cyclist negotiating a corner at a high speed leans inwards in order to successfully pass. Explain how this action enables him to negotiate. (2 mks)

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