Name……. **Index No…….……**

School…… **Candidates Signature……**

Date ……..…..

232/1
PHYSICS
Paper 1
(Theory)
July/August 2009
2 Hours

MANGA DISTRICT SECONDARY SCHOOLS
JOINT EVALUATION TEST - 2009
Kenya Certificate of Secondary Education (K.C.S.E)

232/1
PHYSICS
Paper 1
(Theory)
July/August 2009
2 Hours

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 above*
- *This paper consists of **two** questions **A** and **B.***
- *Answer all the questions in section **A** and **B** in the spaces provided*
- *All working **MUST** clearly be shown in the spaces provided in this booklet.*
- *Non programmable silent electronic calculators and KNEC mathematical tables may be used except where stated otherwise.*
- *Take: acceleration due to gravity, g = 10m/s^2*
  Atmospheric pressure = 1.0×10^5 pa.

FOR EXAMINER'S USE ONLY

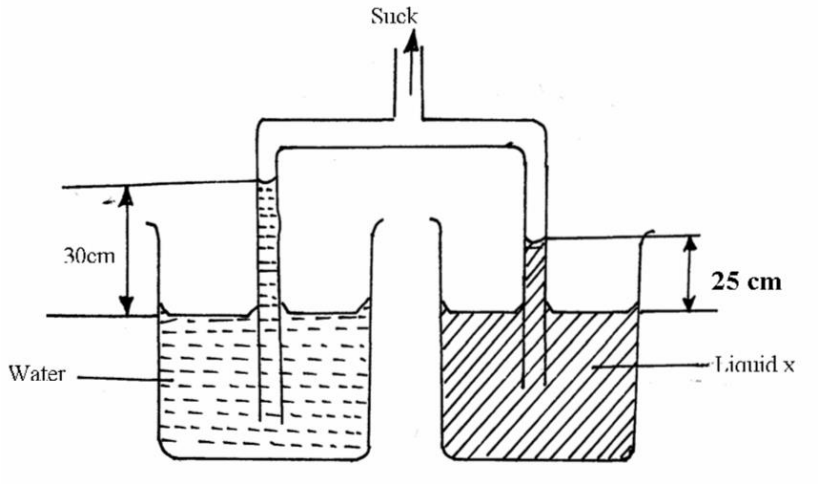
Section	Question (s)	Max. Score	Candidates Score
A	1 – 12	25	
B	13	15	
	14	12	
	15	08	
	16	11	
	17	09	
	Total	80	

This paper consists of 9 printed pages. Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing

SECTION A (25 MARKS)

Answer ALL questions in this section in the spaces provided

1. The figure below shows Hare's apparatus used for comparing liquid densities.



Use the information given in the above diagram to calculate the density of liquid x given that density of water is $1000kgm^{-3}$. (2mks)

2. State the property of water which disqualifies it for use as a thermometric liquid. (1mk)

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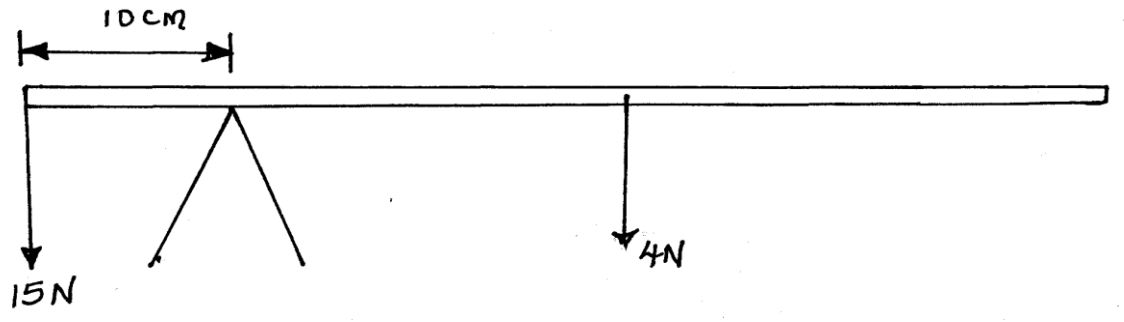
3. The uniform bar in the diagram below is in equilibrium when 4N weight is hang at the centre as shown

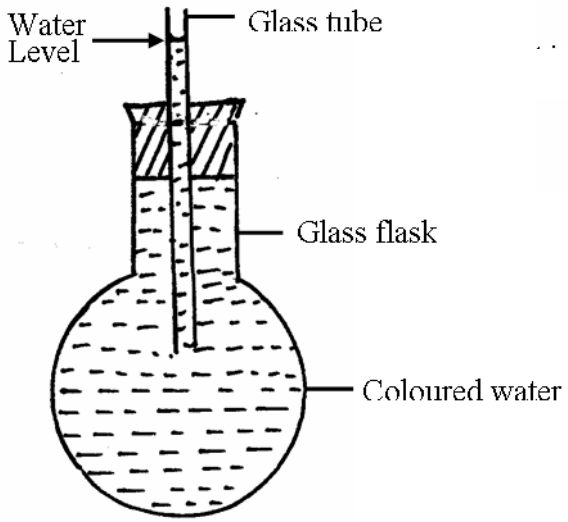


Given that the length of the bar is 0.5m, determine the weight of the bar. (2mks)

4. A body of mass 20kg is raised to a height of 3.0m. Determine the velocity of the body when just about to hit the ground when released from this height. ($g=10ms^{-2}$) (3mks)

5. A spring stretches by 2cm when a mass of 250g is hang from its lower end. What is the spring's constant? (2mks)

6. The figure below shows a flask filled with coloured water. The rubber cork is pushed in until the water rises a short distance in the glass tube.



State and explain what is observed when the flask is placed in a hot water bath. (3mks)

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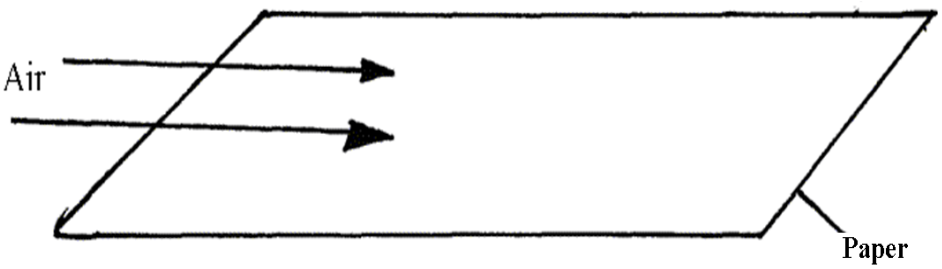
7. A stream of air is passed over a piece of paper as shown below.



State and explain the observations made. (2mks)

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8. Give a reason why liquids and not gases are used in hydraulic machines. (1mk)

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9. An electric kettle with shinny outer surface is more efficient than one with a dull outer surface. Give a reason for this. (1mk)

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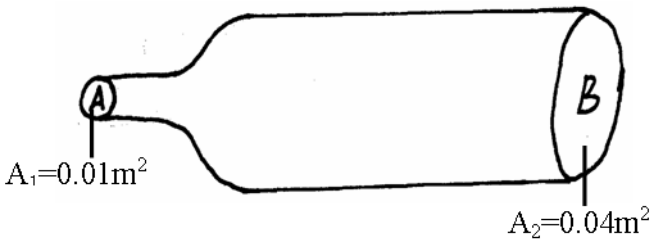
10. The figure below shows water entering a pipe at a velocity of 4 x 10ms^{-1}. The pipe widens on the outlet. Calculate the velocity of water at end B. (2mks)



11. A tout placed a bag on the carrier of a matatu. State and explain what happens to the bag when the vehicle starts moving suddenly. (2mks)

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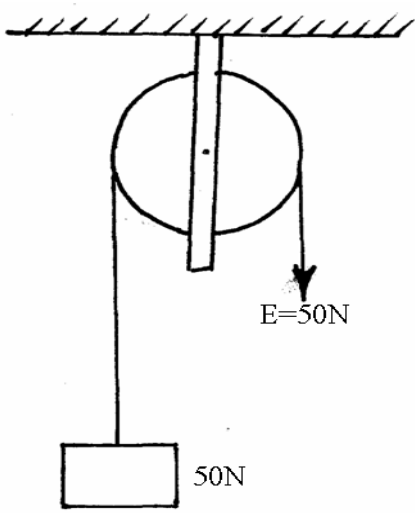
12. The figure below shows a pulley used to raise a load of 50N.



a) What is the velocity ratio of the system? (1mk)

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b) Determine the mechanical advantage. (1mk)

13. State the difference between speed and velocity. (1mk)

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14. The pressure of a gas in a sealed container is observed to rise when the gas is heated. Explain this observation. (2mks)

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SECTION B (55MARKS)

Answer ALL questions in this section in the spaces provided.

15. a) State Archimedes principle. (2mks)

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b) A block of wood measuring 0.8m by 0.5m by 2m floats in water of density. $1.0x10^{3}kgm^{-3}$, 1.2m of the block is submerged. (g=10N/kg)

i) Determine the weight of the water displaced. (2mks)

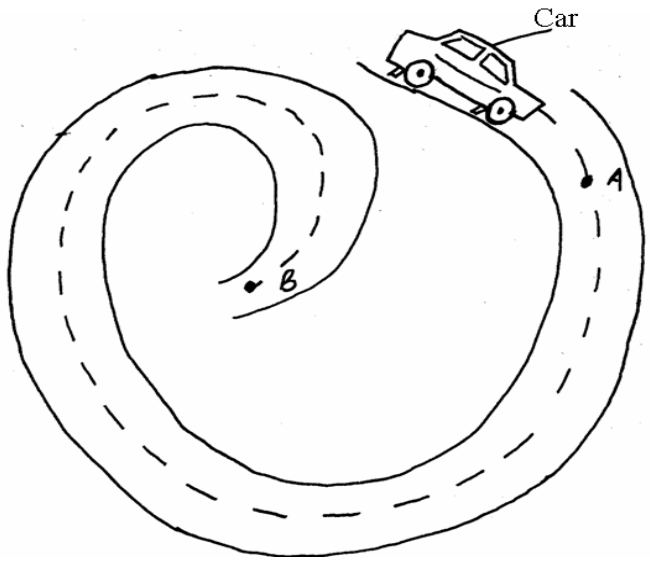
ii) Find the force required to just make the block fully submerged. (2mks)

c) A block of glass of mass 250g floats in mercury. What volume of the glass lies under the surface of mercury? (Density of mercury = $1.36 \times 10^{3}Kgm^{-3}$) (2mks)

d) A piece of sealing wax weighs 3N in air and 0.22N when immersed in water, calculate the density of the wax. (2mks)

e) A balloon weighs 10N and has a gas capacity of $2m^{3}$. The gas in the balloon has a density of $0.1Kgm^{-3}$. If the density of air is $1.3Kgm^{-3}$. Calculate the resultant force of the balloon when it is floating in air. (2mks)

16. a) The figure below shows a car of mass (m) moving along a curved part of the road with a constant speed.



i) Explain why the car is more likely to skid at B than at A. (2mks)

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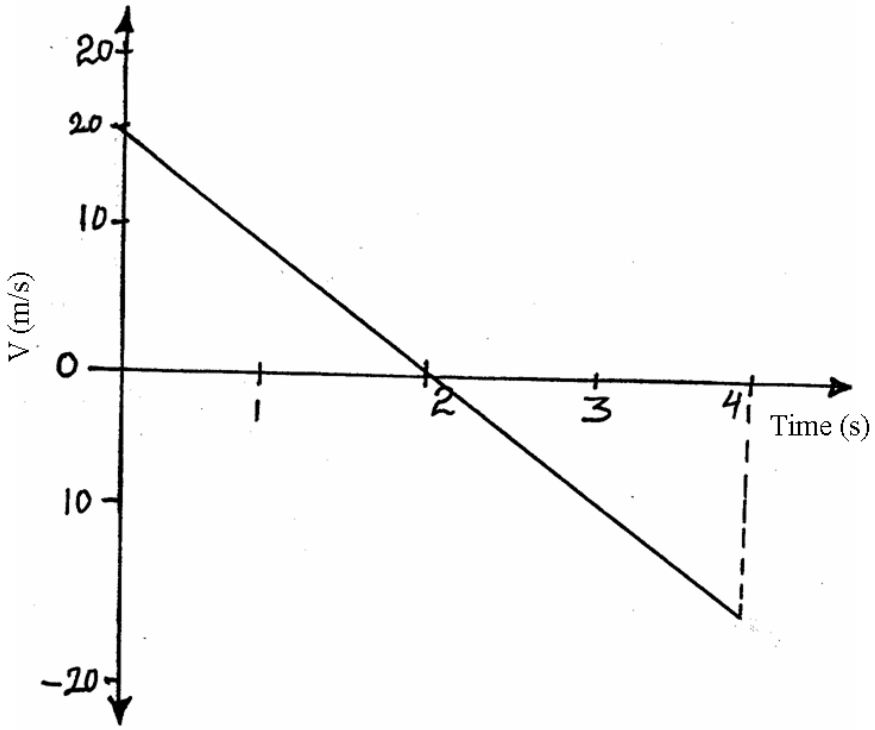
ii) If the radius of the path at B is 250m and the car has a mass of 6000kg, determine the maximum speed the car can be driven while at B without skidding. The coefficient of friction between the road and the tyre is 0.3. (3mks)

b) A string of length 70cm is used to whirl a stone of mass 0.5kg in a circle of vertical plane at 5 rev/s. determine:

i) the period (1mk)

ii) the angular velocity (2mks)

c) The graph below shows how the velocity varies with time for a body thrown vertically upwards.



Determine the total distance moved by the body. (2mks)

17. a) Define the following terms:

i) Velocity ratio of inclined plane. (1mk)

ii) Mechanical advantage of gear system. (1mk)

b) Name a device that is used to convert sound energy to electrical energy. (1mk)

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c) A bullet of mass 20g traveling at $400ms^{-1}$ is stopped by a concrete wall. Calculate the amount of energy transferred to the wall. (2mks)

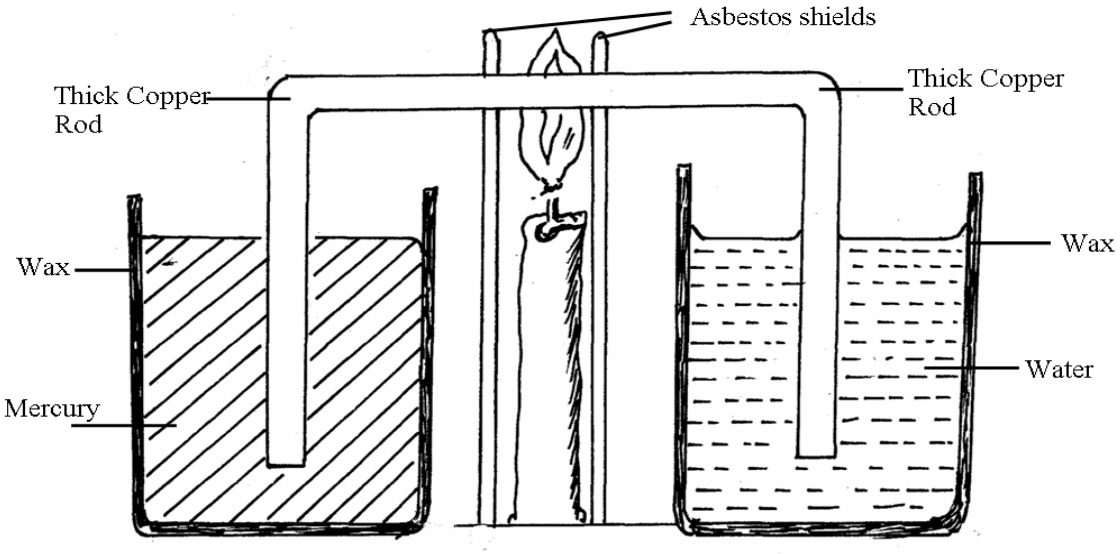
d) A pulley system having a velocity ratio of 4 is used to raise a load of 80N through a height of 0.6m at a constant speed using an effort of 20N in a time of 15S.

Calculate:

i) the efficiency of the system. (2mks)

ii) the power developed by the effort. (3mks)

18. The figure below shows the apparatus used to analyze thermal conductivity of liquids.



a) State the use of asbestos shields. (1mk)

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b) State four observations that can be made in this experiment. (4mks)

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c) State with reasons which liquid is a good conductor of heat. (2mks)

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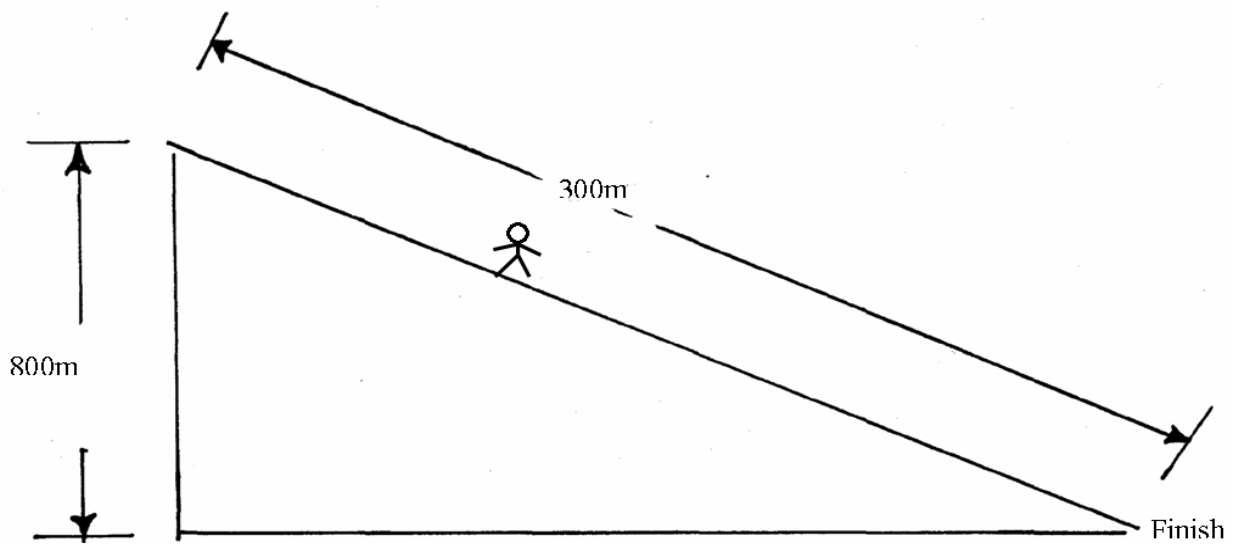
d) A piece of iron of mass 400g is heated for some time in a Bunsen flame. It is then plunged into 250g of water which causes a rise of temperature from 25^0C to 50^0C. Find the temperature of the Bunsen flame. (Specific heat capacities of iron and water = 460Jkg^{-1} and 4200JKg^{-1} respectively) (4mks)

19. In a down hill race a man skis a total distance of 3000m. the vertical height the man drops is 800m as shown in the figure below.



The man and his ski equipment have a total mass of 90Kg.

a) i) Show and label the forces acting on the man as he skis down the slope. (3mks)

ii) The average frictional force pushing against the man is 210N. calculate the total work done against friction as he skis down the slope. (3mks)

iii) Calculate the speed of the skier at the finish. (4mks)

b) A pendulum bob is pulled to one side until it is at a vertical height of 30 cm above its lowest position. The bob is then released. Find its speed as it swings through its lowest position. ($g=10NKg^{-1}$) (3mks)

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