NAME: ……ADM. NO……..…..

SCHOOL……SIGNATURE……

DATE……..……

232/1

PHYSICS

PAPER1

2 HOURS

TERM TWO

INSTRUCTIONS TO CANDIDATES

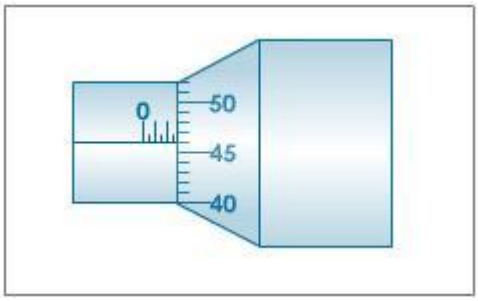
- *Write your name and admission number in the spaces provided above*
- *Sign and write the date of the examination in the spaces provided*
- *Attempt **ALL** questions in sections A and B.*
- *All your answers must be written in the spaces provided in this question paper.*
- *All working must be clearly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

For Examiner's Use Only

Section	Question	Maximum Score	Candidates' Score
A	Q1 – Q11	25	
B	Q12	12	
	Q13	12	
	Q14	10	
	Q15	07	
	Q16	07	
	Q17	06	
		80	

SECTION A (25 MARKS)

1. The figure below shows a section of a micrometer screw guage with a thimble scale of 50 divisions. When the spindle is in contact with the anvil, the device reads 0.25mm. If the screw guage is used to measure the diameter of a spherical ball, state the actual diameter of the ball. (2mrks)



2. When washing clothes, it is easier to remove the dirt using soap in warm water than cold water. Explain. (2mrks)

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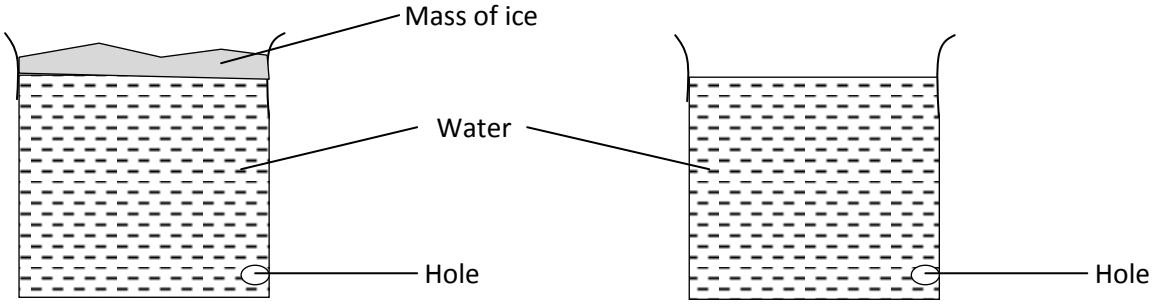
3. The figure below shows two identical cylindrical containers of radius 10.5cm with holes drilled at the bottom of each and filled with water to the same height of 42.1cm. The holes are initially closed. Container A has a 24g mass of ice that virtually covers the whole area above it whereas container A is open.(density of water = 1000kgm^{-1})



i) State and explain the observation that would be made at the holes when opened (2mrks)

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ii) Determine the pressure exerted at the hole of container A. (3mrks)

4. When a litre of milk is poured in 20litres of water, the colour changes to white. Explain (1mrk)

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5. Give a reason why alcohol in glass thermometer cannot be used when boiling water is to be used in an experiment. (1mrk)

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6. Otieno prefers going to the beach in the afternoon hoping to get a relief from the scotch of the day while in Mombasa. Explain how the breeze he likes reaches him. (2mrks)

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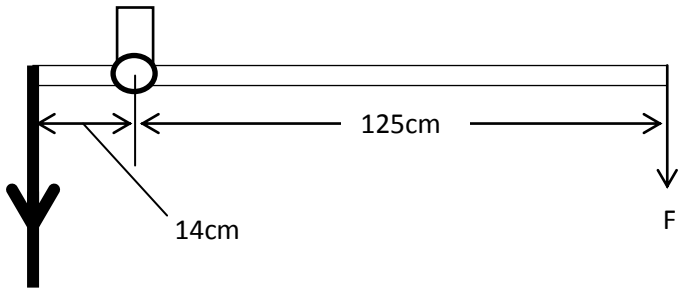
7. Kariuki identifies an abandoned circular water well of diameter 2.1m as a breeding zone for mosquitoes. He intends to use engine oil to control the breeding by pouring it on the surface of the water. Given that the thickness of a molecule in the oil is1.635×10^{-9}, determine the minimum volume of oil he requires. (3mrks)

8. The figure below represents the arm of a lift pump with a force F being applied by the person drawing water. Determine the value of F that just pushes the arm downwards. 3mks

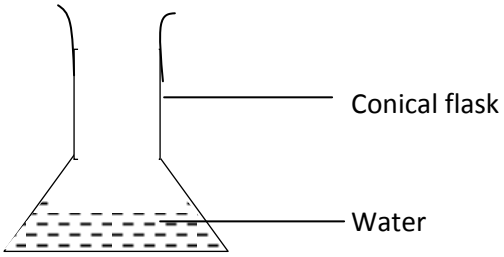


Weight of parts
= 600N

9. Water flows along a horizontal pipe of cross sectional area 48cm^2 which has a constriction of cross-sectional area 12cm^2 at one place. If the speed of water at the constriction is 4ms^{-1}, calculate the speed in the wider section. (2mrks)

10. Determine the extension produced by a pair of parallel identical springs each of constant 1000Nm^{-1} when a mass of 0.2kg is hung below them. (2mrks)

11. The figure below shows a conical flask with some water to the level indicated.



a) State the change in the stability of the flask when more water is added to it. (1mrk)

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b) Give a reason for your answer in a) above. (1mrk)

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SECTION B (55MARKS)

12. a) A car initially moving with a velocity of 10ms^{-1} accelerates uniformly at 1ms^{-2} until it reaches a velocity of 15ms^{-1}. Calculate,

i) the time taken (2mrks)

ii) The distance travelled during the acceleration. (2mrks)

iii) The velocity reached 100m from the place where the acceleration began. (3mrks)

a) A suspected gang vehicle escapes with a punctured fuel tank after being shot by a chase police unit along the highway. Drops of petrol from the tank fall on the road after every 5 seconds. The distance from the first drop to the second is 5m. 20 more drops fall as the vehicle accelerates before the tank empties. The two last drops fall 50m apart. Determine the,

i) Initial velocity of the car (2mrks)

ii) Final velocity of the vehicle just before it ran out of fuel (1mrk)

iii) The acceleration of the car. (2mrks)

13. a) state the law of conservation of energy (1mrk)

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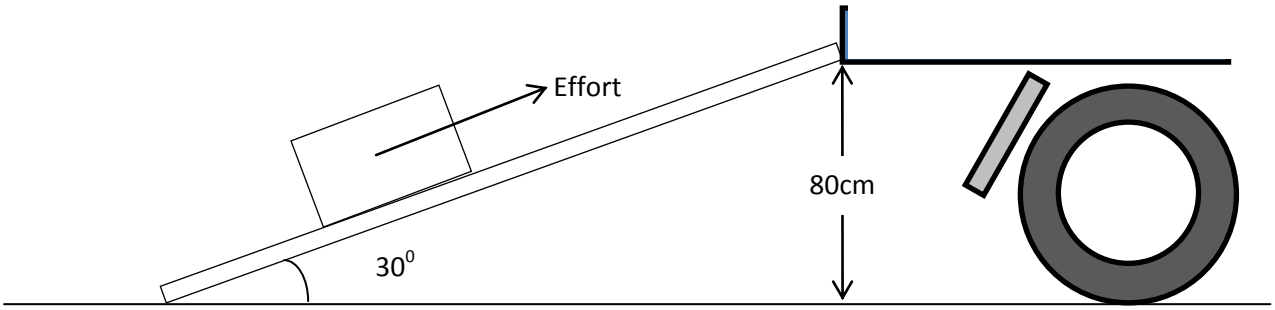
b) Simon slides a refrigerator of mass 71kg along a wooden bar inclined at an angle of 30^0 with the ground onto a truck for transportation. Given that the distance from the ground to the floor of the truck is 80cm, as shown in the figure below, determine,



i) The length of the wooden bar (2mrks)

ii) Useful work done on the refrigerator (3mrks)

iii) Work done by Simon in moving the refrigerator along the wooden bar when he applies a force of 4000N (3mrks)

iv) Efficiency of the inclined plane (2mrks)

v) Account for the value of efficiency obtained in iv) above. (1mrk)

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14. a) state Newton's second law of motion (1mrk)

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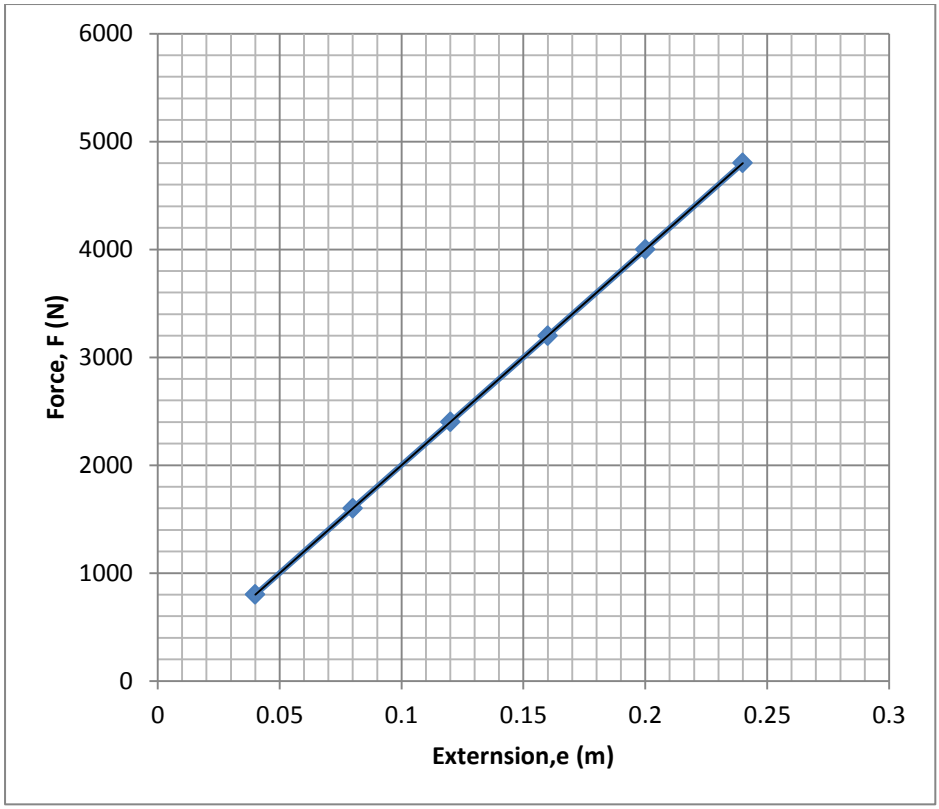
b) A bullet of mass 40g is fired from a gun of mass 30kg and exits the muzzle at $300ms^{-1}$. The bullet travels horizontally to hit a stationary wooden block 30m away after 0.5 seconds. Determine,

i) the recoil velocity of the gun (3mrks)

ii) the force with which the bullet hits the wooden block (3mrks)

iii) the velocity of the bullet just before hitting the block (3mrks)

15. The figure below shows a graph of weights of persons entering a lift against the extension of four springs supporting the lift. From the graph determine,



a) The spring constant of the springs (3mrks)

b) The spring constant of a single spring (1mrk)

c) The mass of passengers that would cause an extension of 0.6m on a single spring. (3mrks)

16. a) define moment of a force (1mrk)

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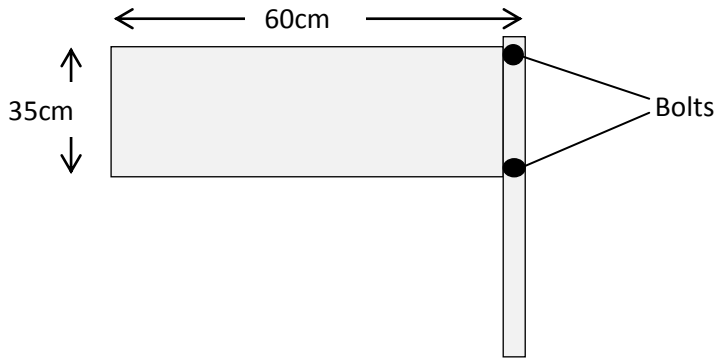
b) A sign board made from a uniform metal sheet is supported by a single post as shown in the figure below. It is to be supported by two bolts.



Given that the weight of the board is 20N,

i) determine the force that the lower bolt applies on the plate to maintain it at horizontal (3mrks)

ii) State one way of reducing the force in i) above. (1mrk)

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c) Explain how the stands of students' lockers that are slightly inclined outwards improve their stability. (2mrks)

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17. a) A tennis ball is struck such that it backspins at it crosses the net before landing in the court area of an opponent player.

i) Explain the trajectory of the ball as it rises above the net. (2mrks)

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ii) Give a possible reason that caused the ball to drop in the opponents court instead of rising continuously (1mrk)

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b) Explain the following;

i) Mountain climbers are highly likely to nose bleed when they reach the mountain top (2mrks)

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ii) A bulldozer easily moves on earth roads while a saloon car cannot. (2mrks)

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