NAME..... ADM NO.....

SCHOOL..... CANDIDATES SIGN.....

DATE .....

232/1
PHYSICS
PAPER 1
FORM THREE
TIME: 2 ½ HOURS

END OF TERM (III) EXAMINATION -2019

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

232/1
PHYSICS
PAPER 1
FORM THREE
TIME: 2 ½ HOURS

INSTRUCTIONS TO THE CANDIDATES

- Write your name, Admission number, class and date of examination.
- The paper consist of section A and B
- Answer all the questions in section A and B in the spaces provided.
- All working must be clearly shown on the spaces provided.
- Mathematical tables and electronic calculators may be used.

FOR EXAMINERS USE ONLY

Section	Question	Maximum score	Candidate score
A	1-13	25	
B	14	9	
	15	9	
	16	9	
	17	10	
	18	8	
	19	10	
TOTAL		80	

SECTION A

1. 200 drops of oil each of volume $0.009cm^3$ were put into a measuring cylinder containing oil upto the level shown in figure 1 below

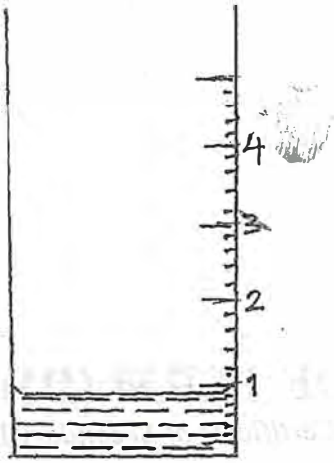

Fig 1

On the same figure mark the new level of the oil (3mks)

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2. Two identical beakers A and B containing equal volumes of water are placed on a bench. The water in A is cold while that in B is warm. Equal amounts of potassium permanganate were placed gently at the bottom of each beaker. It is observed that the spread of colour in B is faster than in A. Explain this observation (2mks)

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3 Figure 2 below shows a uniform metre rule balanced when a mass of 200g is hung at one end.

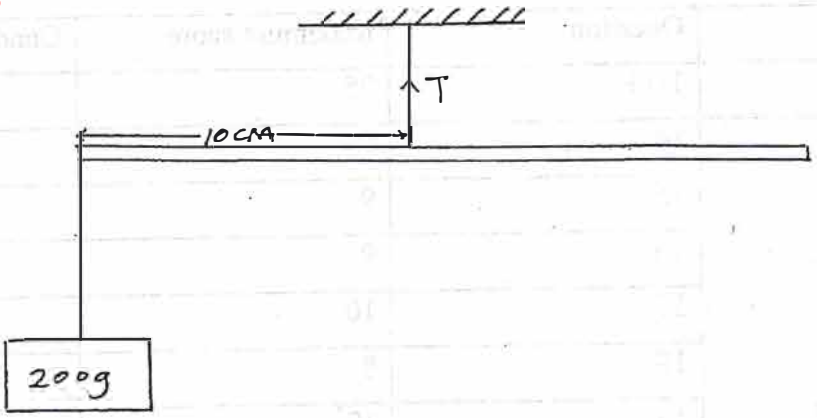

fig 2

Determine the tension in the string (2mks)

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4. State the meaning of the term elastic limit of a spring (1mk)

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5. Define the term acceleration (1mk)

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6. Sketch a graph to show the variation of density against temperature when water is heated from 0^0C to 12^0C (2mks)

7. An oil drop of volume $0.05cm^3$ is placed on a water surface. It spreads to form a patch of diameter 28mm. Calculate the size of oil molecule. (2mks)

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8. State the Newton's second Law of motion (1mk)

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9. A candle is lit and placed on a level bench. State and explain the changes in the stability of the candle as it continues to burn (2mks)

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10. Figure 3 below shows two rods of Copper A and B of the same length but different thickness with candle wax attached to either ends are placed on wooden blocks and heated as shown

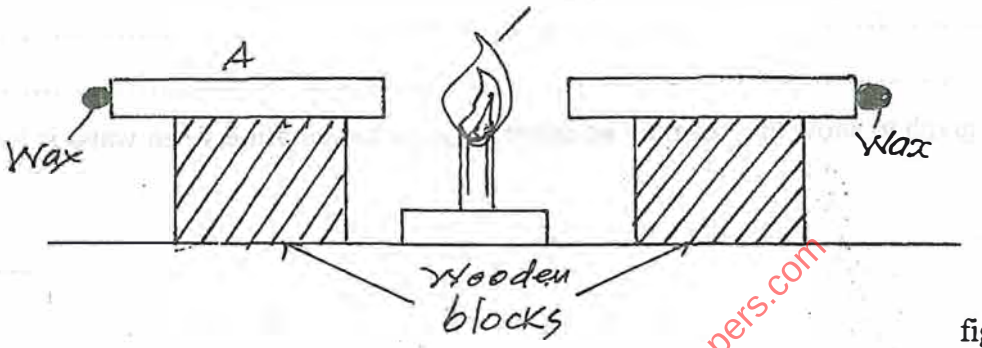

fig 3

On which of the Copper rods will the candle wax melt first. Give a reason for your answer (2mks)

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11. a) Distinguish between streamlines and turbulent flow (2mks)

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b) Figure 4 below shows an equipment used to water plants

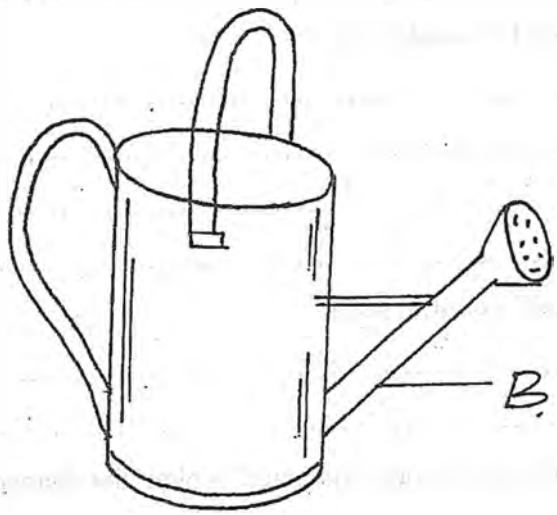

fig 4

Explain why the above equipment is preferred when watering plants as compared to a tube whose diameter is equal to the part marked B (2mks)

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12. An electric motor raises a 60kg mass at a constant velocity. Calculate the power of the motor if it takes 30 seconds to raise the mass through a height of 25m (Take g = 10N/Kg) (2mks)

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13. Explain why a drop of methylated spirit at the back of the hand feels colder than a drop of water at the same temperature (2mks)

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SECTION B (55MARKS)

14. a) You are provided with two identical wires of equal length and diameter. State two ways in which you could use the two wires to make springs of different spring constants (2mks)

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b) The spiral springs shown in figure 5 below are identical. Each spring has a spring constant K = 240N/M

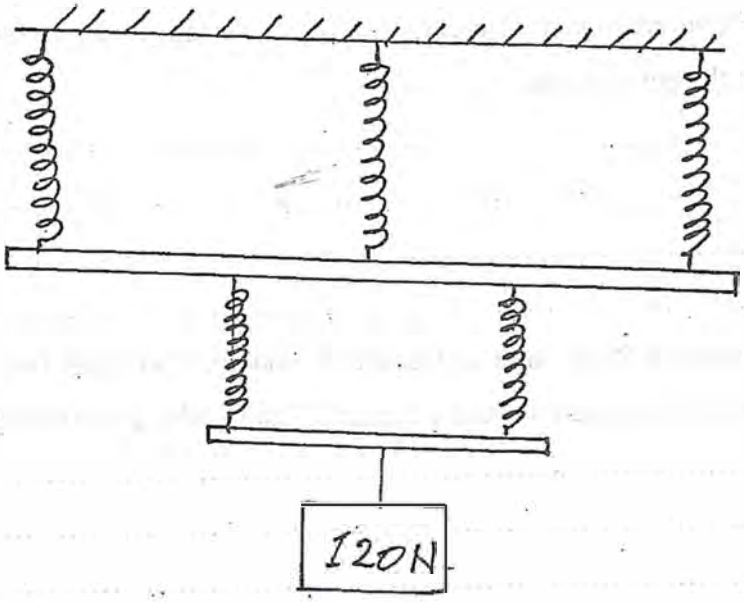

fig 5

Determine the total extension caused by the 120N weight assuming that the weight of the rods and springs is negligible (3mks)

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c) Sketch a graph of length against compressing force for a material that obeys Hooke's law

(2mks)

d) Figure 6 below shows a match stick floating on the surface of water in a basin.

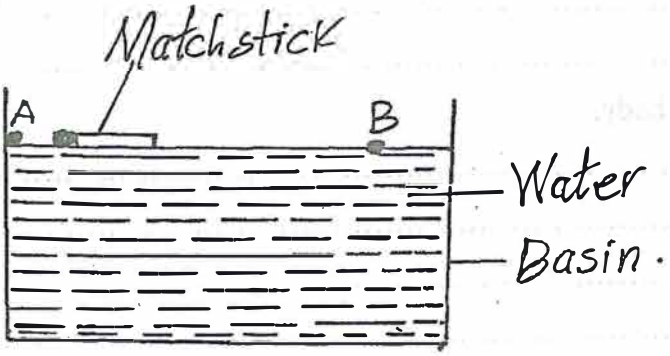

fig 6

When a drop of soap solution was carefully added to the water at A, the match stick is observed to move in a certain direction. State and explain direction of the motion of the match stick. (2mks)

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15. a) Define the term instantaneous velocity (1mk)

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b) In an experiment to measure the acceleration due to gravity, a tape was attached to a body and passed through a ticker-timer. The body was then allowed to fall freely while the ticker-timer was running. The tape shown in the figure 7 below was produced.

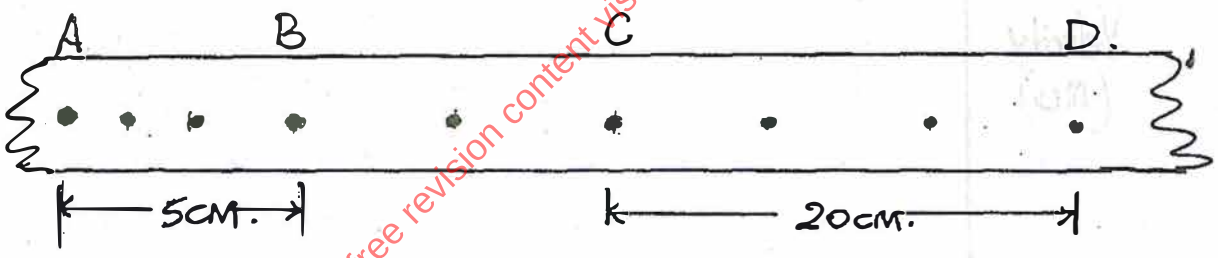

fig 7

Given that the frequency of the ticker-timer was 100Hz,

Determine

(i) average velocity in region AB (2mks)

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(ii) average velocity in region CD (2mks)

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(iii)acceleration of the body. (3mks)

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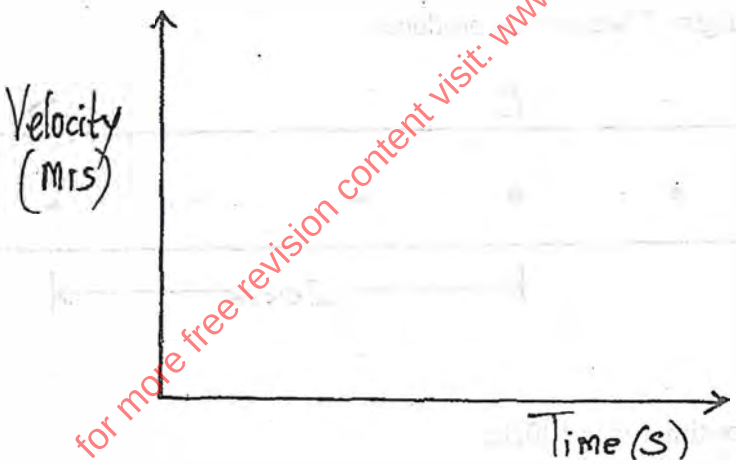
c) On the axes provided, sketch a velocity time graph for a body projected vertically upwards.1mk)



16. a) State why a lorry will cause more damage when it hits a building than a car travelling at the same velocity (1mk)

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b) A bullet of mass 0.006kg is fired from a gun of mass 0.8kg. If the muzzle velocity of the bullet is 500m/s, determine the recoil velocity of the gun (3mks)

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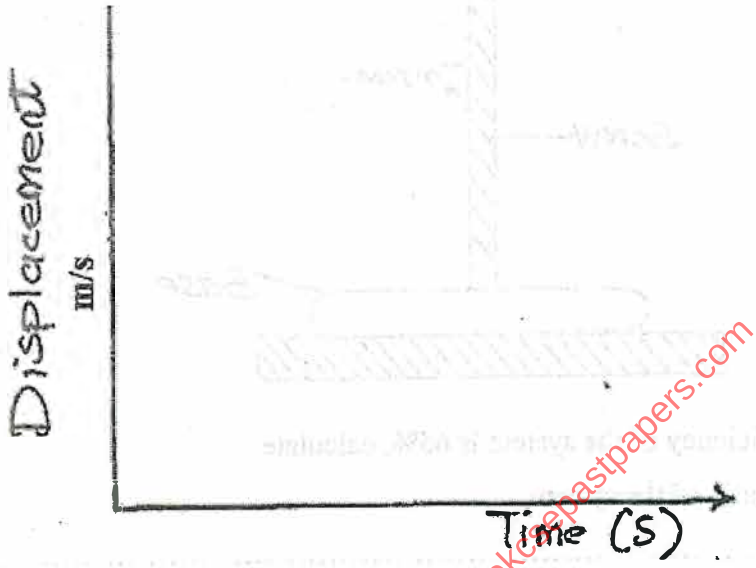
c) On the axes provided sketch graphs of displacement against time when a ball bearing falls through water and glycerin (2mks)



d) State with a reason which of the two wooden blocks below **if any** will experience more friction if they are pulled on a similar horizontal surface as shown in figure 8 (2mks)

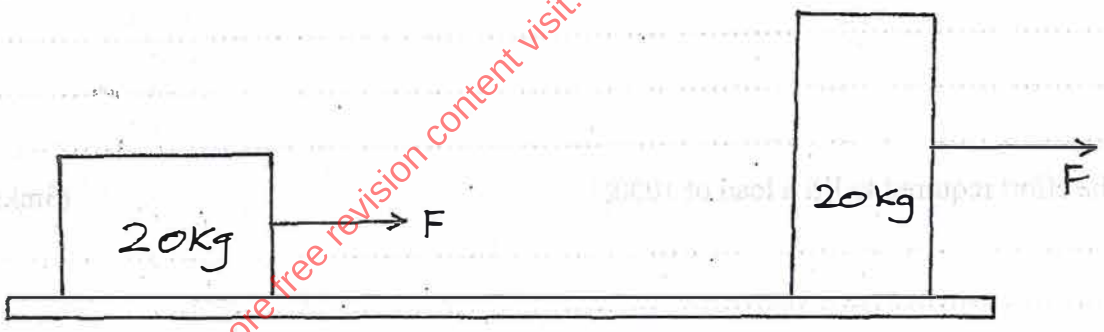


fig 8

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e) When a moving train stops suddenly, passengers are thrown forward. Explain (1mk)

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17. a) Define the term efficiency as used in machines (1mk)

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b) Figure 9 below shows a cross-section of a handle of a screw jack 70cm long. The pitch of the screw is 0.7cm.

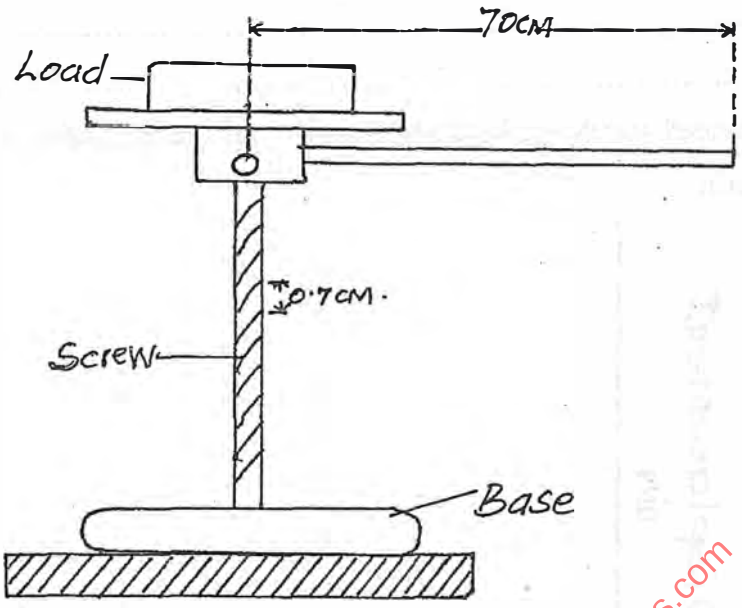

fig 9

Given that the efficiency of the system is 65%, calculate

(i) The velocity ratio of the system (3mks)

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(ii) The effort required to lift a load of 1000N (3mks)

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c) Figure 10 below shows a solid sphere moving on a platform 5m above the ground. It rolls down a curved frictionless path to a point 0.5m above the ground.

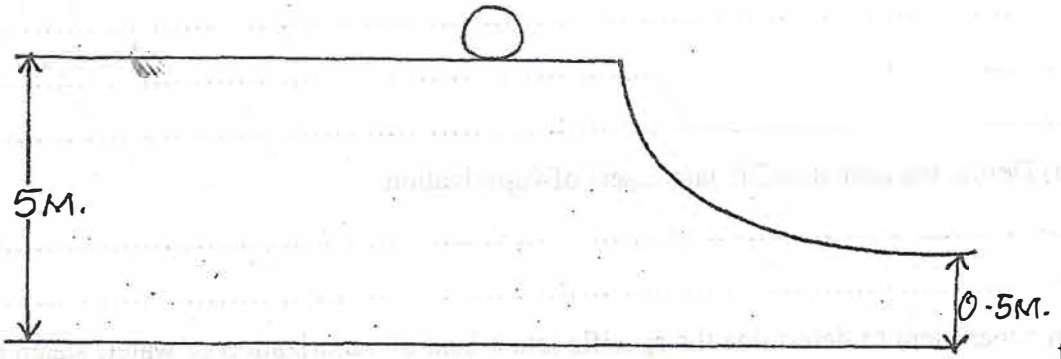

fig 10

Calculate the velocity at the lowest level (3mks)

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18. a) The kinetic theory of gases suggests that molecules of a gas or liquid are in continuous random motion. Explain in terms of the kinetic theory why a gas exerts pressure, which increases when the gas is compressed into a small space. (3mks)

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b) A glass tube contains a column of air that is trapped by a column of mercury. The length of the trapped air column is 150mm while that of mercury is also 150mm as shown in fig 11 below.

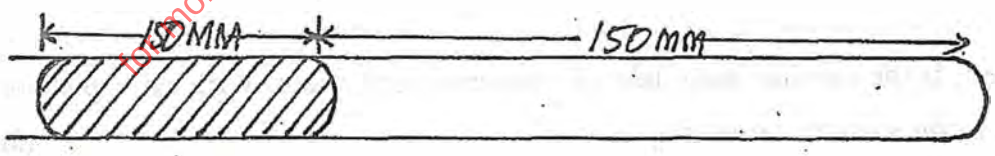

fig 11

One end of the tube is open and atmospheric pressure is 750mmHg. Calculate;

(i) The total pressure exerted on the enclosed air (2mks)

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(ii) If the tube is raised till its vertical and the open end is facing up. Determine the length of the trapped air (3mks)

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19a) Define the term specific latent heat of vaporization (1mk)

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b) In an experiment to determine the specific latent heat of vaporization of water, steam at 100^0c was passed into water contained in a well logged copper calorimeter. The following measurements were made;

Mass of calorimeter = 50g

Initial mass of water = 70g

Initial temperature of water = 5^0C

Final mass of calorimeter + water + condensed steam = 123g

Given that specific heat capacity of water is 4200J/KgK and specific heat capacity of copper is 390J/KgK determine

(i) The mass of condensed steam (2mks)

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(ii) Heat gained by the calorimeter and water (3mks)

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(iii)Given the L is the specific latent heat of vaporization of steam. Write an expression for the heat given out by the steam in terms of L (2mks)

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(iv)Determine the value of L (2mks)

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