NAME:……..……..INDEX……..……
ADM…… SCHOOL:……..
SIGNATURE……..… ……
232/ 1
PHYSICS
PAPER 1/232
TIME 2hrs

SUKELLEMO JOINT EXAMINATION

Kenya Certificate of Secondary Education 2020

INSTRUCTIONS TO CANDIDATES

- *write your name and your class in spaces provided*
- *This paper consists of two sections, **section A** and **section B***
- *Answer **ALL** the questions in each section in the spaces provided.*
- *Mathematical tables and Electronic calculators may be used*
- *All working must be clearly shown where necessary.*

For Examiner's Use Only

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
A	1-10	25	
B	11	12	
	12	11	
	13	15	
	14	17	
	TOTAL	**80**	

SECTION A (25 MARKS)

Answer <u>ALL</u> the questions in this section in the spaces provided

1. The level of water in a burette is at 30 cm^3. 400 drops of water each of volume 0.015 cm^3 was removed from the burette. Determine the new level of water in the burette [3 mks]

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2. Calculate the temperature change of water as it falls through a height of 20 m. (Take g = 10 N/kg and s.h.c of water = 4200 J/kg/K) [3 mks]

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3. State the SI unit of density [1 mk]

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4. Give a reason why heat transfer by radiation is faster than heat transfer by conduction [1 mk]

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5. A railway truck of mass 4000 kg moving at 3 m/s collides with a stationary truck of mass 2000 kg. The couplings join and the trucks move off together. Calculate their common velocity after collision. [3 mks]

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6. State the principle of moments [1 mk]

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7. An air bubble with a volume of 1 cm^3 escapes from the helmet of a diver at a depth of 200 m below the water surface. What will be the volume of the bubble immediately it breaks the surface of water? (Take atmospheric pressure = 10 m of water) [4 mks]

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8. Calculate the acceleration due to gravity on a planet where an object released from rest falls through a height of 54.2 m in 1.08 s. [3 mks]

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9. State the three factors on which the rate of heat flow depends on. [3 mks]

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10. Under a driving force of 3000 N, a car of mass 1200 kg has an acceleration of 1.3 m/s^2. Find the frictional resistance acting in the car. [3 mks]

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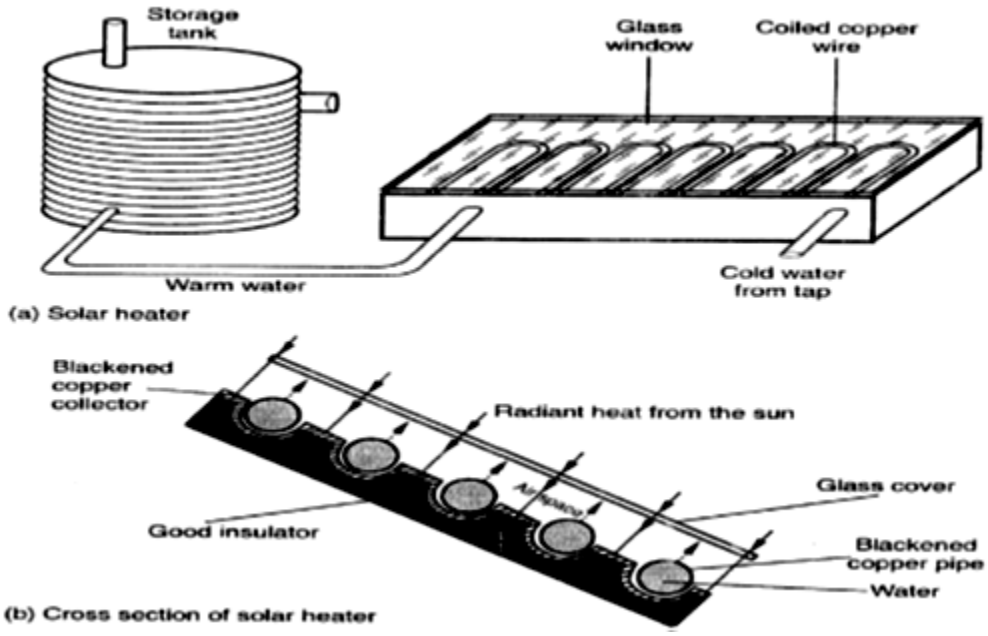
SECTION B (55 MARKS)

Answer ALL the questions in this section

11. a) Explain the following as regards the solar heater:



i) Why the pipe is fixed to a dark-coloured collector plate. [1 mk]

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ii) Why the pipe is made of copper [1 mk]

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iii) Why the pipe is coiled several times [1 mk]

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iv) Why the collector plate is fixed to an insulator. [1 mk]

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v) Why the panel front is covered with glass. [1 mk]

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b). Liquids expand when heated and contract when cooled. However this is not always true for water.

i. What name is given to the behavior of water? [1 mk]

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ii. States two importance of this behavior of water. [2 mks]

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iii. State any two disadvantages of this behavior. [2 mk]

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iv. A man wants to fit a brass ring onto a steel rod of diameter equal to the inner diameter of the ring. Explain how this can be achieved [2 mk]

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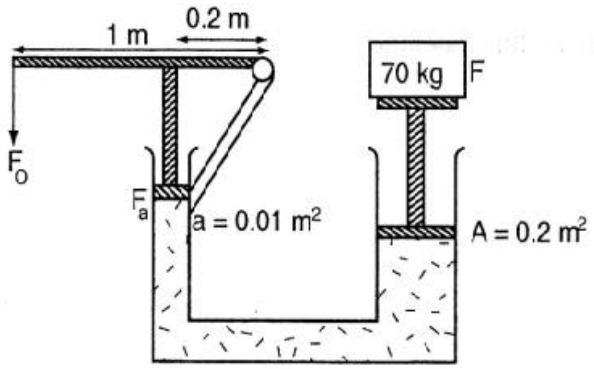
12. The figure below shows a hydraulic press supporting a load F.



a) What properties of liquids make them suitable for use in hydraulic machines such as the one above? [2 mks]

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b) If **A** and **a** are areas of cross-section of the pistons, and the lengths of the arm are as given, find:

i. The force F_o [3 mks]

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ii. The mechanical advantage [1 mks]

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iii. The efficiency of the machine [3 mks]

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iv. State two reasons why the efficiency of a pulley system is always less than 100% [2 mks]

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13. a) You are provided with the following:-

- A block of wood
- A spring balance
- Thin thread
- Overflow can
- A small measuring cylinder
- Some liquid

With the aid of a labeled diagram describe an experiment to the law of floatation. [4 mks]

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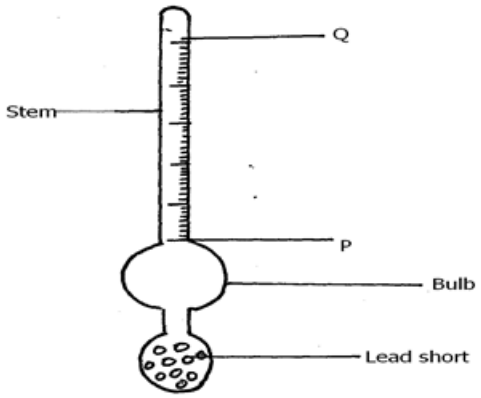
b) The diagram below shows a car acid hydrometer.



(i) Indicate on the diagram above the minimum and the maximum measurement to be taken. [2 mks]

(ii) State the reason why the bulb is wide. [2 mks]

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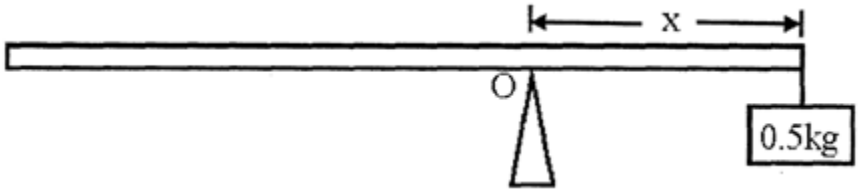
c) (I) Figure below shows a uniform plank of weight 20N and length 1.0m balanced by a 0.5kg mass at a distance x from the pivot point O.



Determine the value of X [2 mks]

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(II) When the block is completely immersed in water the pivot **O** must shift by 0.05 m to the left for the system to balance. The density of water is 1000 kgm^{-3}.Determine:

i) The upthrust U on the block. [3 mks]

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ii) The volume of the block. [2 mks]

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14. a) i) Distinguish between elastic and inelastic collisions. [2 mks]

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ii) A body of mass 5 kg is ejected vertically to a height of 7.2 m from the ground when a force acts on it for 0.1s. Calculate the force used to eject the body.

[3mks]

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b) i) Explain why the moon is said to be accelerating when revolving around the earth at constant speed [2mks]

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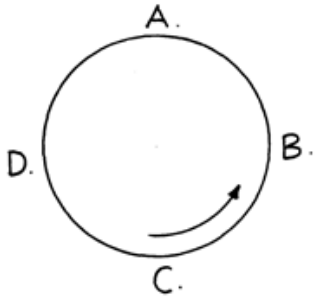
c) A stone is whirled in a vertical circle as shown in the figure below using a string of length 40 cm. A, B, C and D are various positions of the stone in its motion. The stone makes 2 revolutions per second and has a mass of 100g.



i) Calculate:

I. The angular velocity [3mks]

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II. The tension on the string at position A [3 mks]

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(ii) At C where the stone has acquired a constant angular speed, the string cuts. The stone takes 0.5 seconds to land on the ground. How high is point C above the ground. [2 mks]

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iii) How far does it travel horizontally before hitting the ground. [2 mks]

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