



# MASENO SCHOOL

Kenya Certificate of Secondary Education 2020

232/1-Physics- P1  
Tuesday 15/12/2020  
Time 8:00am-10:00am

232/1-

## PHYSICS

-Paper 1

(THEORY)

DEC. 2020

- 2 hours

## THE MASENO SCHOOL MOCK

Name ..... Index Number.....

Candidate's Signature ..... Date .....

### Instructions to candidates

- (a) Write your name and admission number in the spaces provided above.
- (b) Sign and write the date of the examination in the spaces provided above.
- (c) This paper consists of **two** sections **A** and **B**.
- (d) Answer **all** the questions in sections **A** and **B** in the spaces provided.
- (e) **All** working **must** be clearly shown.
- (f) Silent non-programmable electronic calculators may be used.
- (g) This paper consists of 8 printed pages.
- (h) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.
- (i) Candidates should answer the questions in English.
- (j)  $s.h.c$  of water =  $4200 \text{ Jkg}^{-1}\text{K}^{-1}$ , specific latent heat of fusion of ice =  $3.40 \times 10^5 \text{ Jkg}^{-1}$ ,  $s.h.c$  of aluminium =  $900 \text{ Jkg}^{-1}\text{K}^{-1}$

### For Examiner's Use Only

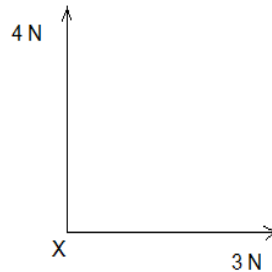
Section	Questions	Maximum Score	Candidate's Score
A	1-14	25	
	15	10	
B	16	12	
	17	10	
	18	11	
	19	12	
	<b>Total Score</b>	<b>80</b>	

**SECTION A (25 marks)**

1. Which branch of Physics deals with kinetic energy within matter? (1 mark)

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2. *Figure 1* below shows a point object X being acted upon by two forces 4N and 3N as shown below. Calculate and show on the diagram, the resultant force acting on the point. (2 marks)



3. What do you understand by the term *angular velocity*? (1 mark)

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4. A fighter plane makes a complete loop in air. Explain why the pilot remains strapped to his seat without falling off. (2 marks)

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5. Two identical beakers A and B containing equal volumes of water are placed on a bench. The water in A is cold while in B it is warm. Identical pieces of potassium permanganate are placed gently at the bottom of each beaker inside the water. In which beaker would the spread of the colour be slower? Explain. (2 marks)

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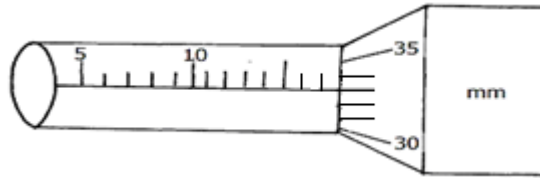
6. State **two** bodies naturally designed for streamline flow. (2 marks)

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7. The figure 2 below shows a section of a micrometer screw gauge.



(i) State the smallest measurement that can be made by the micrometer screw gauge. (1 mark)

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(ii) The thimble of the micrometer screw gauge is rotated through two and half revolutions in the clockwise direction in order to measure the diameter of a marble. State the diameter of the marble. (2 marks)

8. A light bulb of resistance  $950\Omega$  operates normally on a 240V mains. Determine its power rating. (2 marks)

9. Two thermometers P and Q have the same range of temperature, but P has a larger bulb holding more mercury than Q and the capillary of P has a narrower bore than that of Q.

i) State the thermometer which is more sensitive. (1 mark)

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ii) Which thermometer is likely to be first to record a steady reading if both are placed simultaneously in the same beaker of hot water. (1 mark)

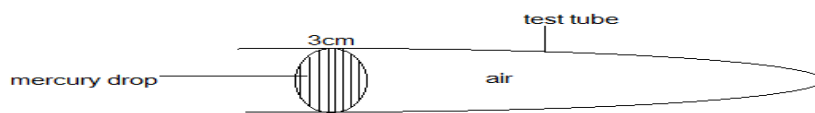
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10. A clinical thermometer has a constriction in the bore just above the bulb. State the use of this constriction. (1mark)

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11. A screw advances 5mm when it is turned through two revolutions. The diameter of the screw head is 100mm. A resisting force of 500N is experienced by the screw when being driven into a piece of wood. Determine the V.R of the screw. (3marks)

12. Given the atmospheric pressure as 75cmHg, determine the pressure experienced by the air in the figure 3 below. (1 mark)



13. State one precaution that a student should take when using a density bottle in the Physics laboratory. (1 mark)

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14. State *two* assumptions made in gas laws.

(2 marks)

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**SECTION B (55 marks)**

15.(a) State the principle of moments

(1 mark)

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(b) A uniform metre rule pivoted at its centre is balanced by a force of 4.8N at the 20cm mark and other two forces, F and 2.0N at the 66cm and 90cm marks respectively. Calculate the force F.

(3 marks)

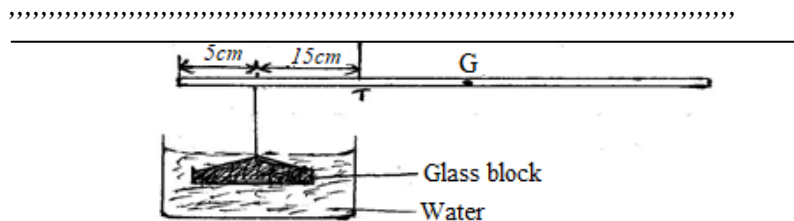
(c) It is easier to loosen a tight nut using a spanner with a long handle than a shorter one. Explain.

(1 mark)

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(d) A uniform metal rod of mass 100g and length 1m is kept at equilibrium by suspending a glass block in water as shown in *figure 4* below.



(i) What is the distance from G to the turning point T?

(1 mark)

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(ii) Determine the weight of the glass block while in water.

(3 marks)

(iii) If the glass block is removed from water, explain why the equilibrium is not maintained.

(1 mark)

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16. (a) In areas of the world where a plane is unable to land, free fall drops can be used to deliver supplies. A plane travelling at a speed of 80m/s and at a height of 70m releases a package of supplies.

i) Sketch the path of the falling package. (1 mark)

ii) Calculate how far the package will land from the drop zone.

(3 marks)

(b) Sketch a velocity – time graph for a body initially moving at a velocity  $u$  before a force  $F$  acting in the opposite direction is applied to it for 5 seconds and thereafter the force  $F$  is withdrawn.

(2 marks)

(c) Explain the importance of safety belts to a passenger in a vehicle. (2 marks)

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(d) An object of mass 150kg moving at  $20\text{ms}^{-1}$  collides with a stationary object of mass 90kg. They couple after collision. Determine their common velocity after collision. (2 marks)

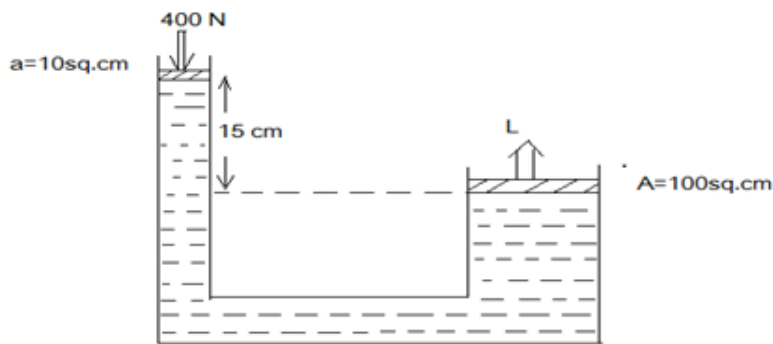
(e) State two applications of the law of conservation of linear momentum. (2 marks)

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17. Consider the *figure 5* below



(a) Name the machine above (1 mark)

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(b) State the principle governing its functioning. (1 mark)

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(c) Determine the maximum load that can be raised by the machine if the liquid used had a density of  $1200\text{kg/m}^3$  (3 marks)

(d) A student observed that when hot water was added into a plastic bottle and the lid replaced immediately, it collapsed .Explain (2 marks)

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(e) Which conditions must be in place for a siphon to work effectively? (2 marks)

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(f) A hippo comfortably walks on muddy river bank while a bull would get stuck yet a bull is lighter.

Explain. (1 mark)

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18. (a) State Archimedes' principle. (1 mark)

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(b) *Figure 6* below shows a piece of wood of mass 20 kg submerged in water and held in position by a string fixed to the bottom of the pond.

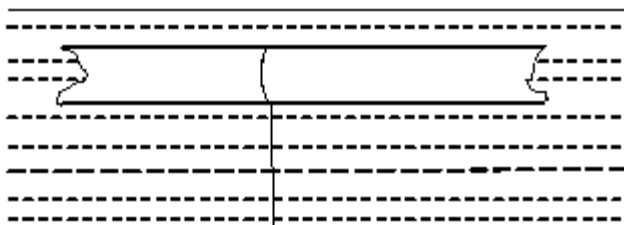


Figure 6

- i. Indicate on the diagram the forces acting on the piece of wood. (3 marks)
- ii. Given that the density of water is  $1000 \text{ kgm}^{-3}$  and that of wood is  $800 \text{ kgm}^{-3}$ ,  
Determine:
  - I Volume of the wood ; (3 marks)
  - II Upthrust of the wood; (2 marks)
  - III Tension in the string. (2 marks)

19. (a) Define the following terms. (2 marks)

- i) Latent heat of vaporization.

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ii) Specific latent heat of vaporization.

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(b) An aluminium tray of mass 300g containing 400g of water is placed in a refrigerator. After 80 minutes, the tray is removed and it is found that 80g of water remains unfrozen at 0°C. Given that the initial temperature of the tray and its contents was 18°C, determine the:

i) Quantity of heat lost by the tray. (2 marks)

ii) Quantity of heat lost by the water and frozen ice. (2 marks)

iii) Quantity of heat removed per minute by the refrigerator. (3 marks)

(c) State two differences between boiling and evaporation. (2 marks)

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(d) State **one** factor that affects boiling.

(1 mark)

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