

NAME:ADM NO:.....

SIGN:.....DATE:

232
PHYSICS
Theory
DEC. 2023
Time: 2 Hours

HOLIDAY PHYSICS ASSESSMENT

232
PHYSICS
Paper
Theory

INSTRUCTIONS TO CANDIDATES

- Write your name and index admission number in the spaces provided above.
- Answer all the questions both in section **A** and **B** in the spaces provided below each question
- All workings must be clearly shown,
- Mathematical tables and silent electronic calculators may be used.
- Take : Acceleration due to gravity, $g = 10\text{m/s}^2$
 Density of water = 1g/cm^3

For examiner's use only

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
Section A	1-13	25	
Section B	14	11	
	15	06	
	16	12	
	17	06	
	18	20	
	TOTAL		80

This paper consists of 12 printed pages Check the Question paper to ensure that all pages are printed as indicated and no question are missing.

SECTION A (25 MARKS)

Answer ALL the questions in this section in the spaces provided

1. (a) Draw a diagram to represent a scale of a micrometer screw gauge of thimble scale 50 divisions and reading 3.68mm. (2mks)

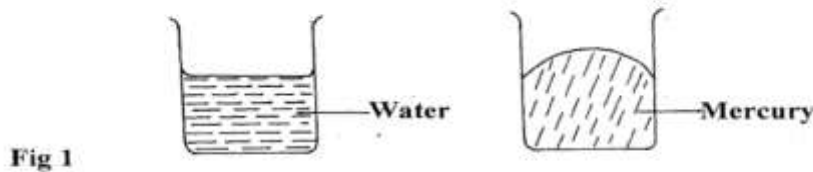
- (b) Determine the actual reading if the micrometer screw gauge above has a zero error of 0.03mm. (1mk)

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2. State why braking systems use Liquid and not gases. (1mk)

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3. The figure 1 below shows the level of mercury and water in a beaker.

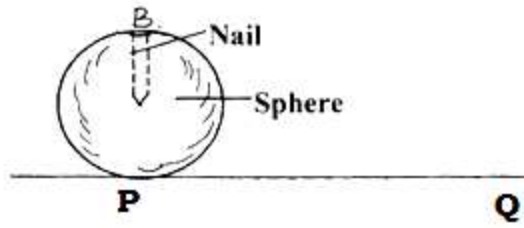


- Explain the difference in the shape of the meniscus. (1mk)

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4. The figure 2 below shows a wooden sphere with a nail hammered into it at point H as shown below.

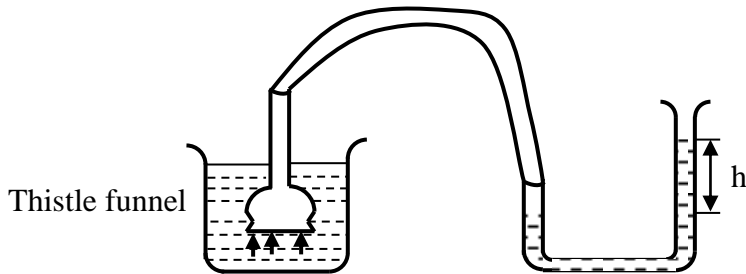
Fig 2



The sphere is rolled on a horizontal ground and comes to rest after sometime at point Q.

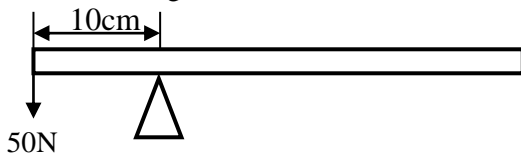
Draw the sphere after it comes to rest at point Q (1mk)

5 The diagram below shows a set up used by a student to show variation of pressure in a liquid. State and explain the effect on the height, h , when the thistle funnel used moved towards the surface of the liquid. (2 mks)



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b) A uniform half metre rod is balanced on a knife edge by a force of 50N placed as shown in the figure below.



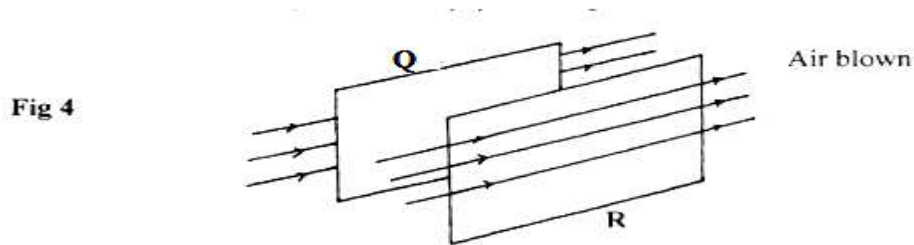
Determine the weight of the rod (2mks)

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6. The reading of a mercury barometer is 75.58 cm at the base of a mountain and 66.37cm at the summit. Calculate the height of the mountain (Density of mercury = 13.6g/m^3 and density of air = 1.25kg/m^3)

7. A current of **2 A** passes through bulb **Q** for **2 minutes 30 seconds**. Determine the quantity of charge through Q (2mk)

8. The figure 4 below shows two light sheets of paper arranged as shown.

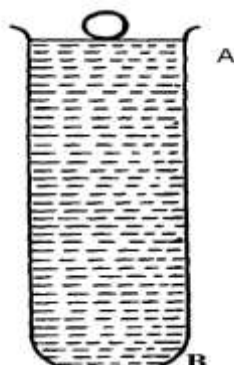


State what is observed if strong air is blown at the same time behind paper Q and in front of paper as shown (1mk)

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9. (a) State one conditions necessary for the law of conservation of linear momentum to hold (1mk)

(b) The diagram below shows a steel ball bearing gently dipped in a viscous liquid contained in a tall cylinder



Name giving their directions the forces acting on the ball bearing as it moves down the cylinder

(3mks)

10. Explain why it is safe to hold the other end of a burning match stick.

(1mk)

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11. The figure below shows two parallel current-carrying conductors A and B placed close to each other. The direction of the current is into the plane of the paper.



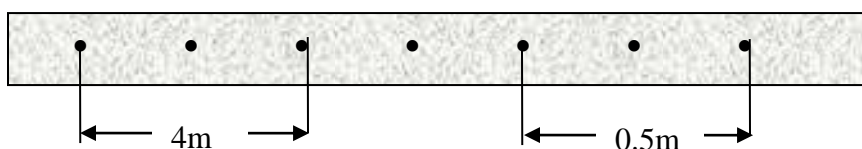
(i) Sketch the magnetic field pattern

(2mks)

(ii) indicate the force F due to the current on each conductor

(1mk)

13. The pattern below shows oil leakage on a path at the rate of 10 drops per second from a lorry.



(a) Calculate the initial and final velocity

(1mks)

(b) Calculate the acceleration of the lorry

(2mks)

SECTION B

14. A helicopter, which was ascending vertically at a steady velocity of **20m/s**, released a parcel that took **20** second to reach the ground.

(i) State the direction in which the parcel moved immediately it was released. (1 mk)

(ii) Calculate the time taken by the parcel to reach the ground from the maximum height (3mks)

(iii) Calculate the velocity of the parcel when it strikes the ground.
(2mks)

(iv) Calculate the maximum height above the ground the parcel reached.
(3mks)

(v) What was the height of the helicopter at the instant the parcel was dropped.
(2mks)

15. Carton of mass 50kg is attached to the hook of a spring balance from the roof of a lift. What is the reading on the spring balance when the lift is

(i) Accelerating downwards at 1m/s^2

(2mks)

(ii) Accelerating upwards at 8m/s^2

(2mks)

(iii) The lift breaks down and is under free fall.

(2mks)

16. a. Define the terms and state the **S.I** units of each.

(i) Work

(2mks)

(ii) Energy

(2mks)

(iii) Power

(2mks)

(iv) Machine

(2mks)

b. Name a device that is used to convert;

(4mks)

(i) Sound to electrical energy

(ii) Electrical energy to kinetic energy.....

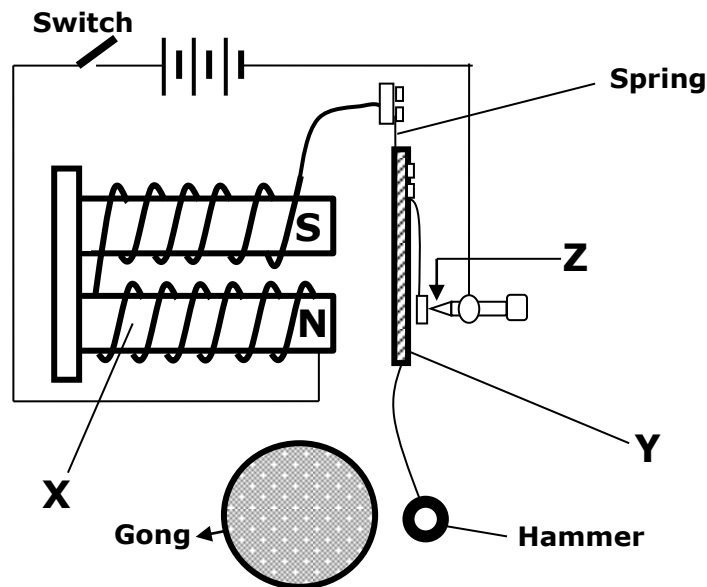
- (iii) Electrical energy to sound energy
- (iv) Electrical energy to light energy
- (v) Solar energy to electricity energy

c. A crane lifts a load of **500 kg** through a vertical distance of **2m** in **8 s** determine

i) Work done by the crane (2mks)

ii) Power developed by the crane (2mks)

17. The figure below shows a simple electric bell circuit



i) Name the parts labeled. (3mk)

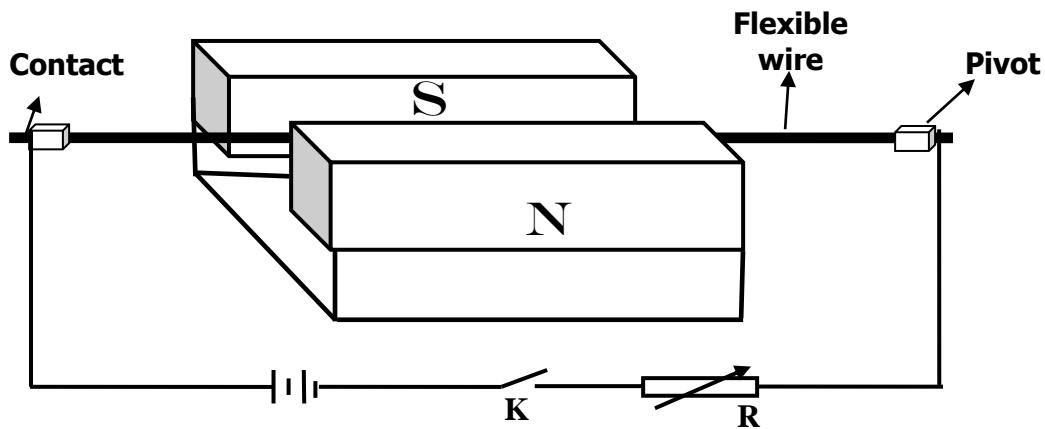
- I) X
- II) Y
- III) Z

ii) When the switch is closed, the hammer hits the gong repeatedly. Explain why:

I) The hammer hits the gong. (2mk)

II) The hammer hits the gong repeatedly (2mk)

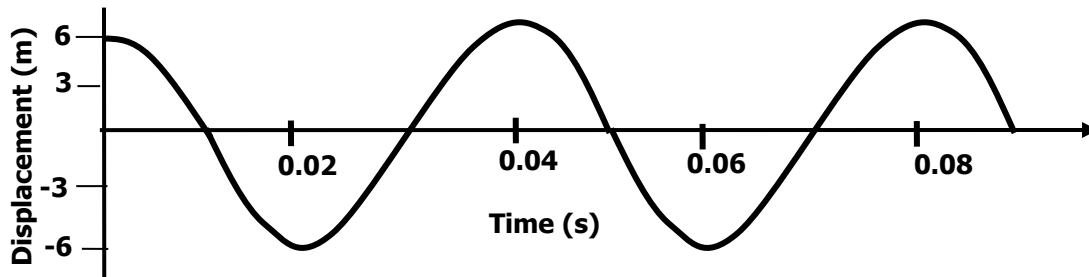
iii) The diagram in the figure below shows a flexible wire in a magnetic field.



(iii) Explain the behaviour of the wire when the switch K is turned on (2mks)

(iv) What is the behaviour of the wire if R is reduced? (1mk)

18. The Figure below shows a wave profile of moving at a velocity of 150m/s.



Determine:

(i) Amplitude (1mk)

(ii) Period. (2mk)

(iii) Frequency. (2mk)

(iv) Wavelength. (2mk)

(v) On the same axis of the wave above, sketch a wave with half the amplitude and double the period.
(2mk)

(vi) A student stands between two halls and 400m from the nearest hall. The halls are X metres apart. Every time the student claps, two echoes are heard by the student such that the first echo comes after 2.5 seconds while the second follows 2 seconds later. From this information calculate;
i) The speed of sound in air. (2 mks)

(ii) The value of X . (3 mks)

THIS IS THE LAST PRINTED PAPER