

Name: ..... Adm. No.....  
 School ..... Candidate's sign: .....  
 Date.....

**PHYSICS(THEORY)**

**TIME: 2½ HOURS**

**INSTRUCTIONS TO CANDIDATES:**

- Write your name, admission number, date of examination and the name of your school in the spaces provided above.
- Sign and write the date of examination in the spaces provided above.
- This paper consists of sections: A and B.
- Answer all the questions in section A and B in the spaces provided.
- All working must be clearly shown in the spaces provided.
- Mathematical tables and electronic calculators may be used.

**For Examiner's Use Only**

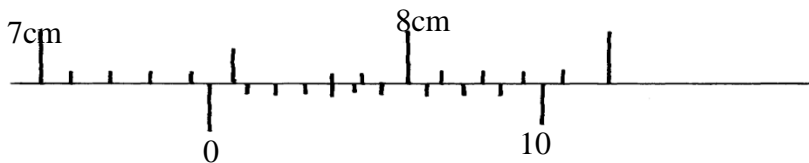
SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1 - 12	25	
B	13	13	
	14	12	
	15	16	
	16	14	
<b>TOTAL SCORE</b>		<b>80</b>	

*This paper consists of 6 printed pages. Candidates should check the question paper to ascertain that all the pages are printed as indicated and no questions are missing*

**SECTION A (25MARKS)**

Answer all question this section

1. Distinguish between mass and weight of a body stating the S.I units for each. (2mks)
2. The figure below shows part of scale of vernier calipers.



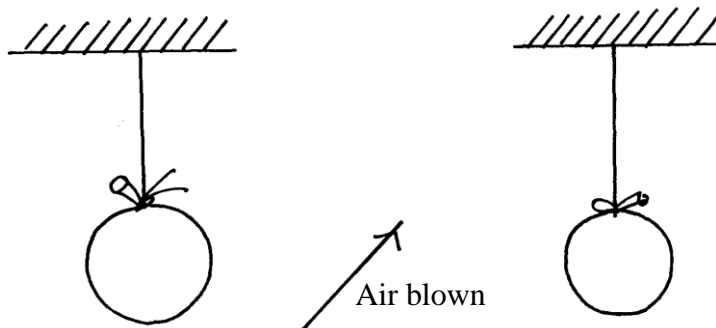
What is the reading indicated on the scale ..... (1mk)

3.  $180\text{cm}^3$  of fresh water of density  $100\text{kg/m}^3$  is mixed with  $2200\text{cm}^3$  of sea water of density  $1025\text{kg/m}^3$ . Calculate the density of the mixture (4mks)

4. Explain why fish can survive under water when the surface is already frozen (2mks)

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5. Two inflated balloons are at the same level while suspended from threads a short distance apart as shown below;

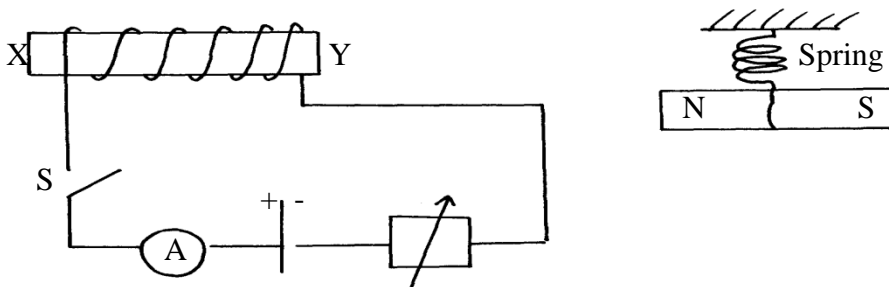


Some air is blown gently in the space between the balloon in horizontal direction. Explain what happens to the balloons. (2mks)

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6. State **one** advantage of an alkaline battery over a lead acid battery. (1mk)

7. The diagram below shows a permanent magnet suspended by a spring. State with reason the behaviour of the magnet when the switch is closed. (2mks)



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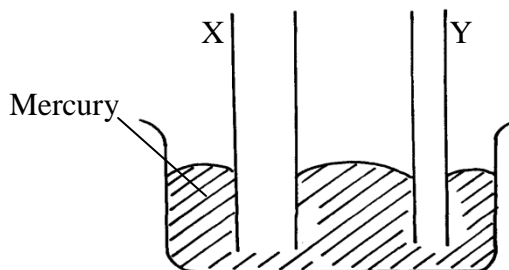
8. Convection and diffusion both involve motion of fluids. Distinguish between the two. (2mks)

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9. A negatively, charged rod is brought close to (but not touching ) an uncharged sphere. If the sphere is momentarily earthed and then the rod is removed, briefly explain what happens. (2mks)

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10. Indicate on the diagram below, the level of mercury in the tubes X and Y (2mks)



11. An object weighs 1200N on a certain planet. What is the gravitational field strength of this planet if the object is 60kg? (3mks)

12. State **two** properties of a thermometric liquid. (2mks)

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**SECTION B (55MARKS)**

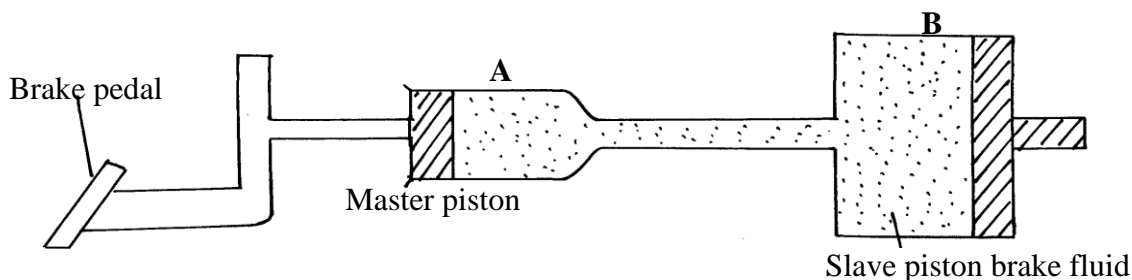
*Answer **all** question this section*

13.

a) Define **pressure** and give its S.I nits. (2mks)

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b) The diagram below represents a motor car hydraulic braking system;



i. State **two** properties of the liquid used as a brake fluid (2mks)

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ii. Given that in the diagram (b) above the master piston has an area of  $15\text{cm}^2$  and the slave piston has an area of  $50\text{cm}^2$  a force of  $100\text{N}$  is applied on the master piston. Find the force used to stop the car. (3mks)

c) Compare the values of pressure in the two pistons above and give a reason for your answer. (2mks)

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d) Give a reason why gas is not suitable for use in place of the brake fluid. (1mk)

e)  $X\text{cm}^3$  of substance A which has density of  $800\text{kg/m}^3$  is mixed with  $100\text{cm}^3$  of water with a density of  $1000\text{kg/m}^3$ . The density of the mixture is  $960\text{kg/m}^3$ . Determine the value of X (3mks)

14.

a) Give reasons why it is necessary to leave the caps of the cells open when charging an accumulator (1mk)

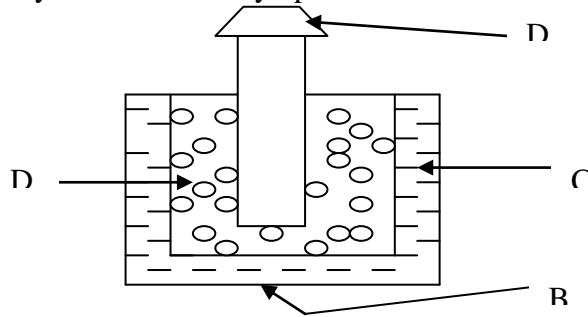
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b) Define current and state its SI unit (2mks)

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c) A charge of  $120\text{ coulombs}$  flow through a  $1\text{ am}$  every minute. Calculate the current flowing through the lamp. (3mks)

d) What do you understand by open and closed circuits. (2mks)



i. State the polarities of A and B. (2 mks)

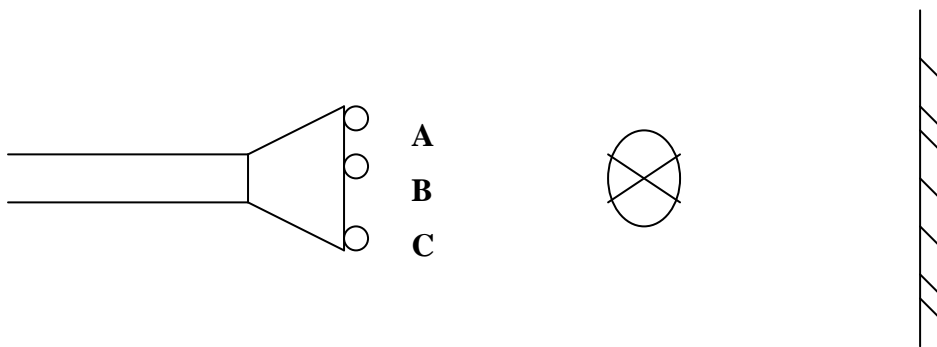
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ii. Name the chemical substances in the parts labeled C and D (2mks)

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15.

a) The figure shows an arrangement of source of light, an opaque object and a screen. Using A, B and C as point sources, sketch on the same diagram labeled a ray diagram to show what is observed on the screen. (3mks)



b) In a certain pinhole camera, the screen is 10cm from the pinhole. When the pinhole is placed 6cm away from a tree, a sharp image of a tree 16cm high is formed on the screen. Find the height of the tree. (3mks)

- c) Distinguish between Lunar and Solar eclipse by stating the events that lead to the formation of each (4mks)

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- d) A girl stands 4 m in front of a plane mirror
- i. What is the distance between the girl and the mirror (3mks)

- ii. Explain how you would use an electroscope to distinguish between a conductor and an insulator (3mks)

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16.

- a) Fill in the table of charges appropriately ( 5mks)

Charge on Electroscope	Charge brought near cap	Effects on leaf divergence
+	+	
-	-	
+ or -	Uncharged body	

- b) What is the name given to the method of charging an electroscope where it requires an opposite charge to the one of the charging materials? (1mk)

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- c) Distinguish between a basic physical quantity and a derived physical quantity giving an example of each. (3mks)

Physical quantity	Derived physical quantity

d) State any **two** ways by which frictional force between two surfaces can be reduced.

(1mk)

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e) Explain why large mercury drops form a ball on a glass slide

(2mks)

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f) Explain why a man using a parachute falls through air slowly while a stone falls through air very fast.

(2mks)

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