



**CENTRAL EAST EDUCATION DIVISION**  
**2026 CEED MOCK EXAMINATION**



# PHYSICS

## PAPER I

**Theory**  
 100 marks)

**Subject Number: M164/I**

**Monday, 23 March**

**Time allowed: 2 hours**  
**(08: 00am – 10: 00am )**

### Instructions

1. This paper contains 14 printed pages. Please check.
2. This paper contains **two** sections **A** and **B**. In **Section A** there are short answer questions while in **Section B** there are restricted essay questions.
3. Answer **all** the thirteen questions in the spaces provided.
4. Write your **Name** in the spaces provided at the top of the question paper.
5. The maximum number of marks for each answer is indicated against each question.
6. In the table provided on this page, **tick** against the number of the question you have answered.
7. Hand in your Paper at the end of the examination

| Question Number | Tick if answered | Do not write in these columns |  |
|-----------------|------------------|-------------------------------|--|
| 1               |                  |                               |  |
| 2               |                  |                               |  |
| 3               |                  |                               |  |
| 4               |                  |                               |  |
| 5               |                  |                               |  |
| 6               |                  |                               |  |
| 7               |                  |                               |  |
| 8               |                  |                               |  |
| 9               |                  |                               |  |
| 10              |                  |                               |  |
| 11              |                  |                               |  |
| 12              |                  |                               |  |
| 13              |                  |                               |  |
|                 |                  |                               |  |

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**Turn over**



**Section A (70 marks)**

Answer all the **ten** questions in this section in the spaces provided.

1. a. i. State the **Boyle's** gas law.

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**(1 mark)**

ii. The initial pressure of a fixed volume of a gas is 100Pa. Calculate the final pressure in Pascal's if the temperature of the gas is raised from 38<sup>0</sup>C to 328<sup>0</sup>C.

**(3 marks)**

b. Describe how thermal expansion is applied in separating stuck tumblers.

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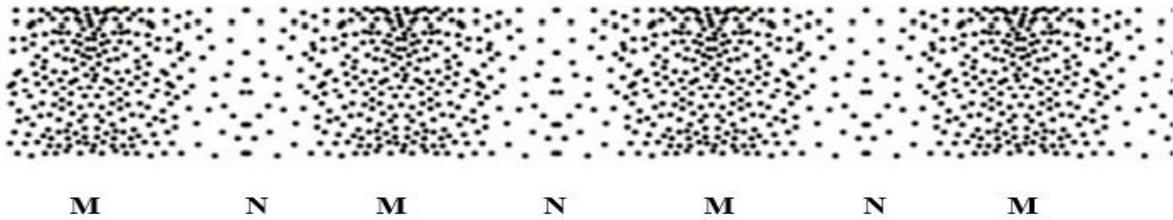
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**(3 marks)**

c. **Figure 1** is a wave.



**Figure 1**

i. Which region in the wave in **Figure 1** has high density?

\_\_\_\_\_

(1 mark)

ii. Give any **two** examples of waves under this type of wave shown in **Figure 1** above.

\_\_\_\_\_  
\_\_\_\_\_

(2 marks)

2. a. State any **two** factors that affect centripetal force.

\_\_\_\_\_  
\_\_\_\_\_

(2 marks)

b. A wave with a speed of 60cm/s has a wavelength of 20cm, calculate the period of the wave.

(3marks)

c. State any **two** examples of scalar quantities.

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(2 marks)

3. a. Define the term 'doping' as used in digital electronics.

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(1mark)

b. Radioactive substance  $^{238}_{92}\text{X}$  decays by emission of alpha particle to produce substance **M**. Write a balanced nuclear equation of this emission.

(3

marks)

c. State any **two** similarities between a human eye and a camera.

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(2 marks)

4. a. State the law of conservation of mechanical energy.

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(1 mark)

b. Explain any **two** negative impacts of power generation and transmission.

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(4 marks)

c. Differentiate between diffraction and interference of waves?

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(2 marks)

5. a. Define resonance.

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(1 mark)

b. A boy produces a sound of frequency of 345Hz. If the speed of sound wave in air is 340m/s, calculate the wavelength of the sound wave produced.

(3 marks)

c. Briefly describe how atmospheric pressure can be demonstrated using collapsing can.

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(3 marks)

6. a. In terms of band theory, explain why insulators do not conduct electricity.

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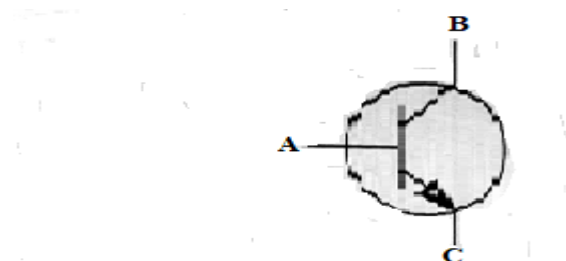
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(3 marks)

b. Figure 2 shows a symbol of a transistor.



i. Name the type of transistor shown.

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(1 mark)

ii. Name the part labelled B

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(1mark)

- c. Determine the change in momentum produced when a force of 350 N acts on a body which is at rest for 0.02 seconds.

(3 marks)

7. a. State the Lenz's law.

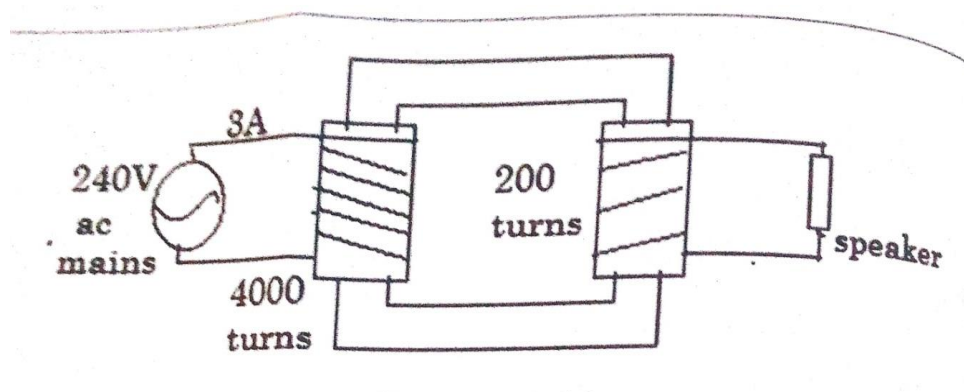
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(1 mark)

- b. **Figure 3** shows a transformer.



**Figure 3**

- i. Name the type of transformer above.

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(1 mark)

ii. Work out the voltage across the speaker.

(3 marks)

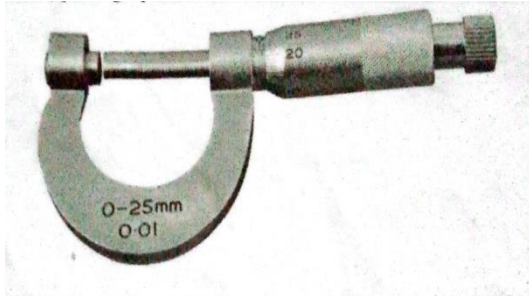
8. a. State any **two** effects of anomalous expansion of water.

( 2 marks)

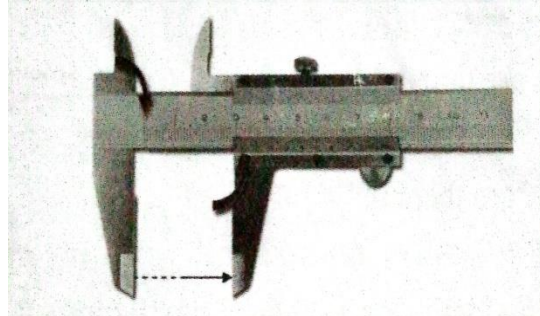
b. **Six** identical springs were arranged parallel to each other and a mass of **12kg** was hung on them. If each spring has a spring constant of **10N/m**. Find the total extension of the system.

(3 marks)

9. **Figure 4** shows measuring instruments labelled A and B, use it to answer questions that follow.



A



B

**Figure 4**

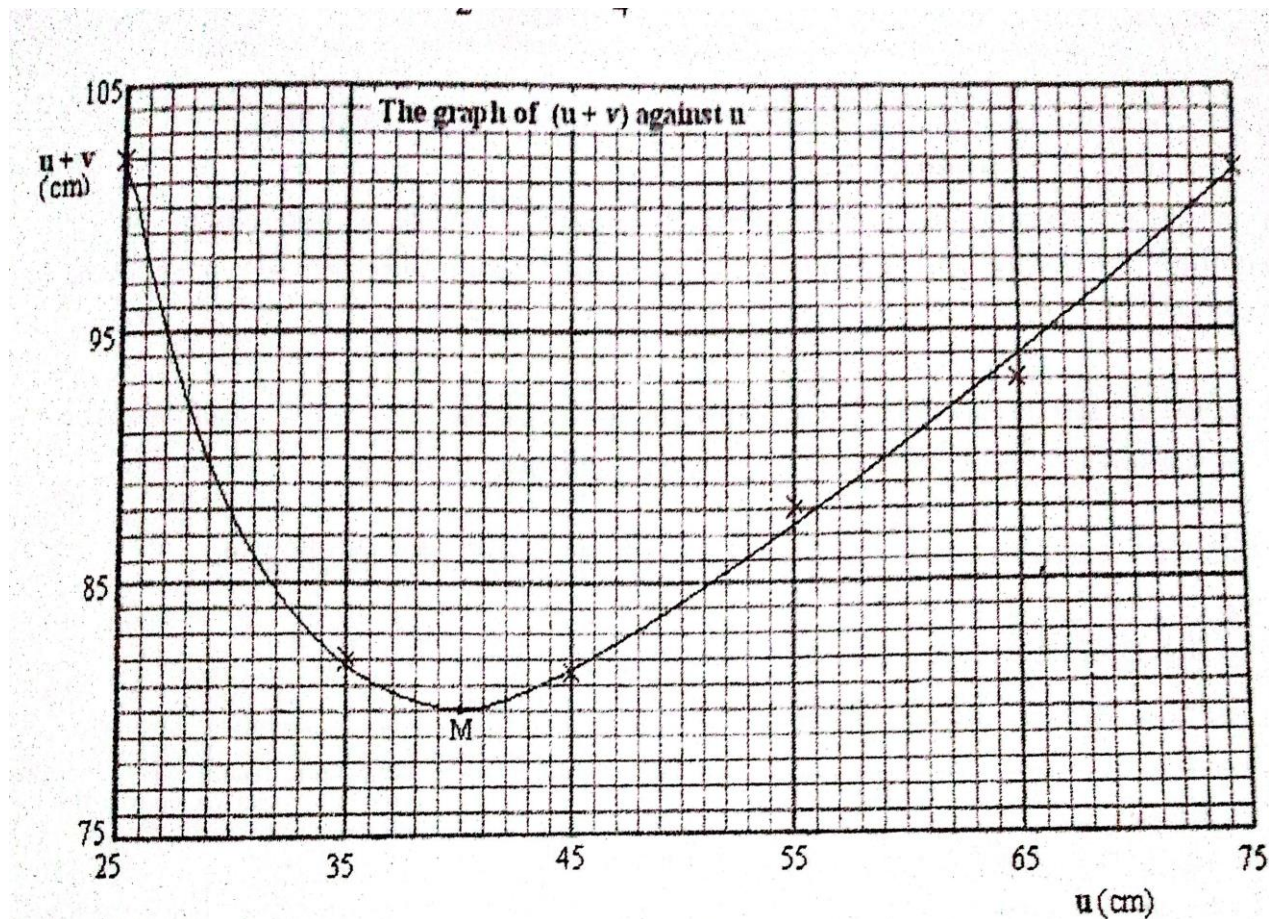
- a. **i.** Name the instrument labelled A

\_\_\_\_\_ (1 mark)

- ii.** Which instrument is most suitable to measure the thickness of a razor blade?

\_\_\_\_\_ (1 mark)

- b. **Figure 5** shows a graph drawn by a student representing  $u+v$  against  $u$ .



**FIGURE 5**

- i. Use the graph to determine the focal length of the lens used by the student.

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(2 marks)

- ii. Apart from the graphical method above, give any **one** method of determining the focal length of the lens.

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(1 mark)

10. a. Derive the formula to show that liquid pressure depends on its density and depth.

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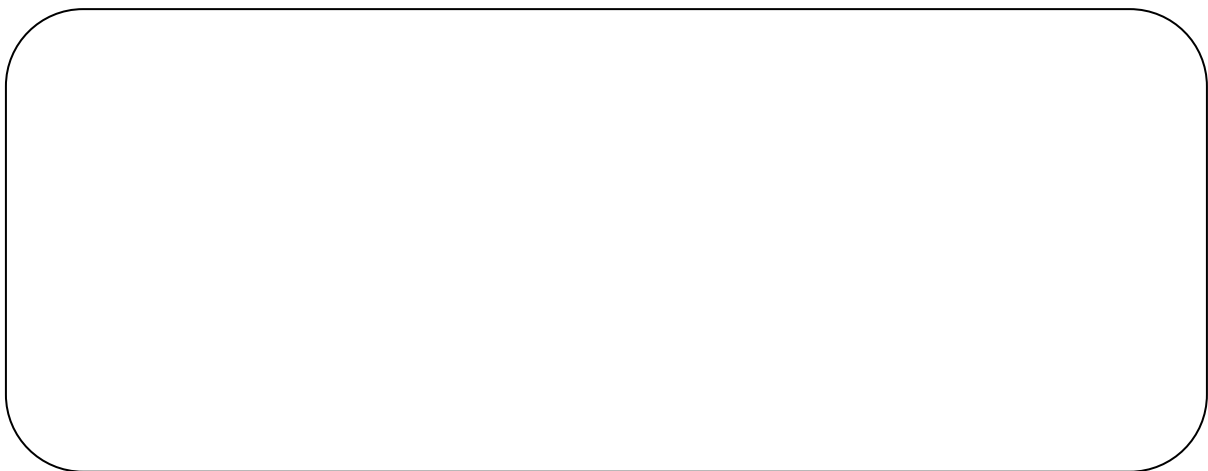
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(5 marks)

- b. Draw a ray diagram to show the position of an image of an object 6cm high placed 16 cm from a convex lens of focal length 8cm.

(Use a scale of 1cm to represent 2cm)



(3marks)

- c. Give any **two** applications of Newton's third law of motion.

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(2 marks)

**Section B** (30 marks)

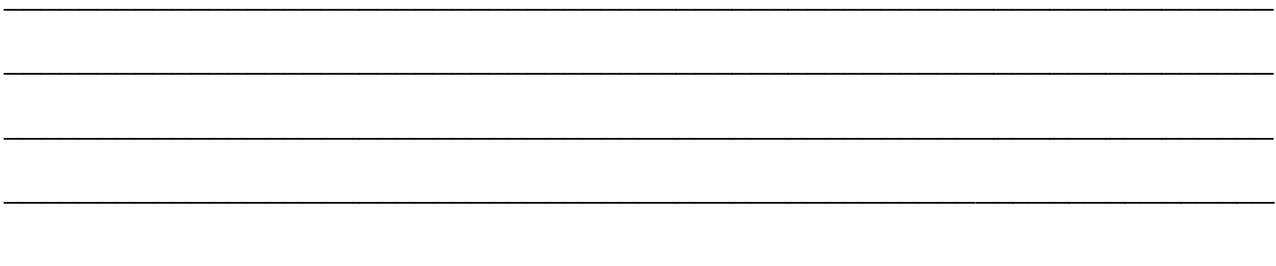
Answer all the **three** questions in the section in the spaces provided.

11. a. Show that angular velocity,  $\omega = 2\pi f$



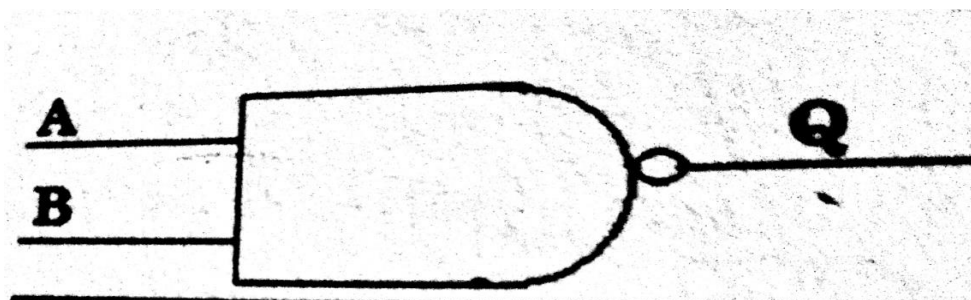
**(5marks)**

b. With the aid of a diagram, describe how thermal expansion is applied in joining two metal plates using riveting.



**(4 marks)**

12. a. Construct the truth table represented by the logic gate symbol below:



(5 marks)

b. Describe how increase in temperature affects the speed of sound in air.

(4 marks)

13. Describe the experimental procedure that you would use to show that the size of upthrust that a liquid exerts on a body immersed in it is equal to the weight of the water the body displaces.

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on the right side, suggesting it's resting on a surface.

**(10 marks)**

**END OF QUESTION PAPER**

**NB: This paper contains 14 printed pages.**

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