EXAMINATION NO.: _____

THE MALAWI NATIONAL EXAMINATIONS BOARD

2025 MALAWI SCHOOL CERTIFICATE OF EDUCATION EXAMINATION

PHYSICS

Subject Number: M164/1

Tuesday, 8 July

Time Allowed: 2 hours
8:00 – 10:00 am

PAPER I

(100 marks)

Theory

Instructions

1. **This paper contains 12 printed pages. Please check.**
2. Write your **Examination Number** at the top of each page of this question paper.
3. This paper contains two sections, **A** and **B**. In Section **A** there are **ten** short answer questions while in section **B** there are **three** restricted essay questions.
4. Use of scientific calculator is allowed.
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 question paper to the invigilator when time is called to stop writing.

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

Section A (70 marks)

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

1. a. Give any **two** thermometric substances that are used in a liquid-in-glass thermometer.

_____

_____

(2 marks)

b. Calculate the relative density of a liquid in which an object of mass 900g weighs 6N when fully immersed in it.

(4 marks)

c. **Figure 1** shows gas particles placed in identical balloons, **R** and **S**.

R S

Figure 1

(i) Which balloon will have greater pressure when both balloons are heated equally?

_____

(1 mark)

(ii) Give a reason for the answer in **1 c.(i).**

_____

_____

_____

(1 mark)

Continued/…

2. a. List any **two** applications of couples in our everyday life.

_____

_____

(2 marks)

b. Calculate the force generated by a car of mass 2 tones which accelerates at $10m/s^2$.

(3 marks)

c. Give any **two** factors that affect inertia of a moving body.

_____

_____

(2 marks)

5. a. Define 'half-life' as used in radioactivity.

_____

_____

(1 mark)

b. A radioactive sample has an initial mass of 32g. If its half-life is 1 week, what mass of the sample will have decayed after 4 weeks?

(3 marks)

6. a. Give **two** factors that affect pressure in solids.

_____

_____

(2 marks)

b. Calculate the temperature for a pressure reading of 770 mmHg of a constant-volume gas thermometer which reads 758 mmHg at 0 °C of ice and 806 mmHg at 100 °C.

(4 marks)

Continued/...

7. a. According to Newton's third law of motion, explain how walking makes a person move forward.

_____

_____

_____

(2 marks)

b. **Figure 3** shows a block of mass 10 Kg being dragged at a constant velocity with a force of 50N at an angle of 60°.

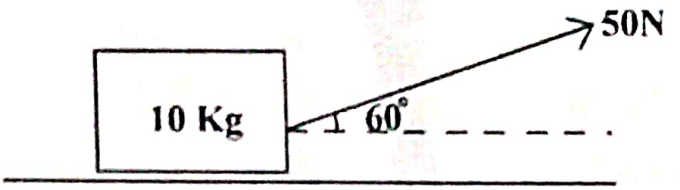

Figure 3

(i) Calculate the dynamic friction force, F_R.

(2 marks)

(ii). Calculate the coefficient of kinetic friction.

(2 marks)

8. a. Give any **two** properties of vectors.

_____

_____

(2 marks)

b. **Figure 4** shows an electric circuit symbol.

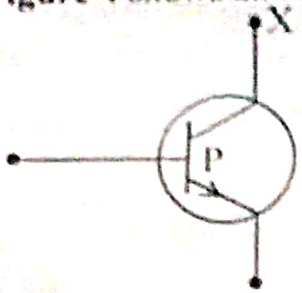

Figure 4

(i) Name the symbol.

_____

(1 mark)

(ii) Name the part labelled **X** .

_____

(1 mark)

(iii) Give any **two** uses of the electric circuit symbol.

_____

_____

(2 marks)

9. a. State the difference between speed and velocity.

_____

_____

(1 mark)

b. **Figure 5** shows graphs of motion of two automobiles, **P** and **Q**.

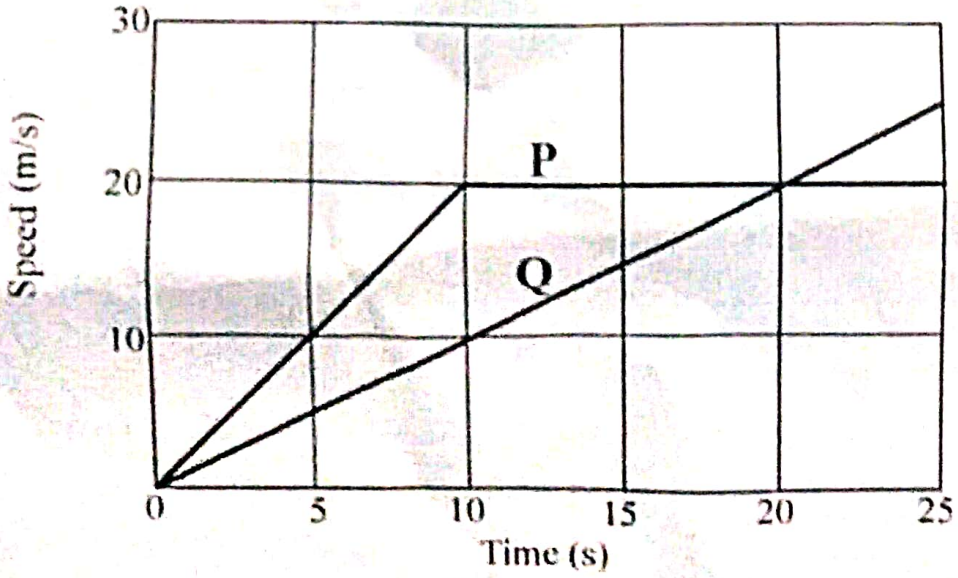

Figure 5

Continued/...

9. b. (Continued)

(i) Describe the motion of automobile **P** during the first 20 seconds.

_____

_____

(2 marks)

(ii) Which automobile will have travelled a longer distance during the first 20 seconds?

_____

(1 mark)

10. a. Calculate the power reaching a distribution station when a grid line that uses 500V and 4A has an internal resistance of 5Ω.

(5 marks)

b. **Figure 6** is a diagram showing two different sound signals, **A** and **B**.

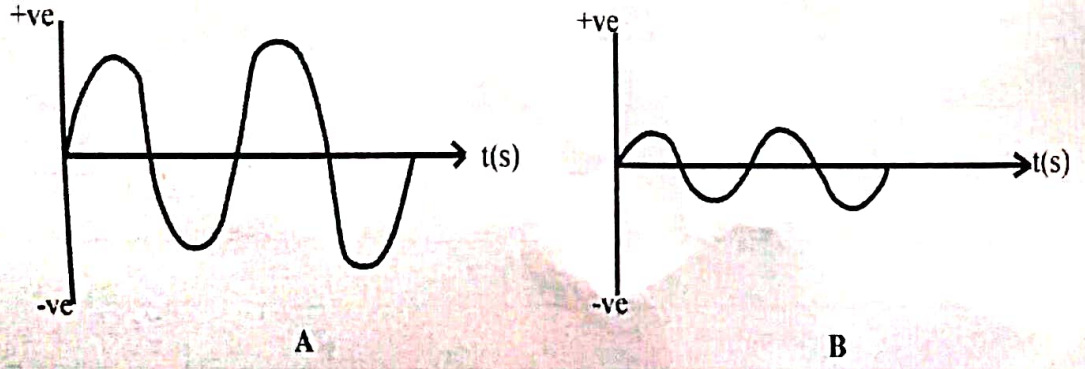

Figure 6

(i) Which signal represents a loud sound?

_____

(1 mark)

(ii) Give a reason for the answer in **(i).**

_____

_____

(1 mark)

Continued/...

Section B (30 marks)

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

11. a. Describe how a diode works in forward bias mode.

(5 marks)

b. Describe how a spring balance can be calibrated using a 5N object.

(5 marks)

12. With the aid of a well labelled diagram, describe how a constant-volume gas thermometer works in measuring a cold object.

(10 marks)

Continued/...

13. a. Show that $v = f\lambda$

(5 marks)

b. Describe how the focal length of a lens can be determined using object-distance method.

(5 marks)

END OF QUESTION PAPER