

**PHYSICS**

**Pape 1**

**AUG. /2025**

**2<sup>1</sup>/<sub>2</sub> hours**



**WAMALA MIXED SECONDARY SCHOOL-MPAMBIRE**

End of Term II Examinations 2025

**PHYSICS**  
*(Theory paper)*

**Senior Five**

**Duration: 2 hours: 30 mins**

**Instructions to learners**

- *This paper is comprised of two sections, **A** and **B***
- *The total number of items in this paper are six (6)*
- *Items in section **A** are compulsory and only make a choice in section **B**.*
- *Answer only one item from each part in section **B**.*
- *Answers to all questions must be written using a black or a blue ball point pen and answers to any items must on a fresh page.*
- *A silent non-programmable calculator may be used where necessary.*

*Use acceleration due to gravity, **g**, as **9.8 ms<sup>-2</sup>**.*

## SECTION A

*(All items in this section are compulsory)*

### ITEM I

Kane drives a car of mass estimated to weigh 1.85 tonnes. He uses it transport sugar canes from two towns, A and B which are 2000m from each other. One day as he was heading to town B, he realised that he use a speed of  $76 \text{ kmh}^{-1}$  after which he applied brakes to stop the car using a frictional F. The speedometer of the can does not indicate the;

- i) Frictional Force
- ii) Time taken and also
- iii) Acceleration

Se wishes to know these value to plan better for his never journeys.

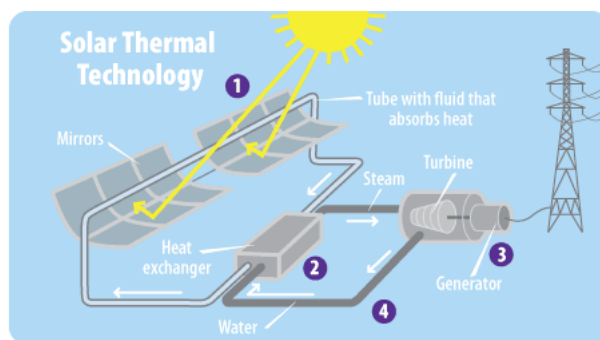
#### Task

As a physics learner, help Kane cane have a quick start so that he plans his journeys better.

### ITEM II

Around March next year, the government of Uganda wishes to set up a solar thermal power plant in areas of Gulu. According to research, these areas receive about  $5.1 \text{ kW/m}^2$  of solar energy per day. People in that area say that this will not help them but just waste their land that the government wants to use to construct the power plant. Oming, one of the people from that area do not know how the plant will be able to generate electricity yet there is not dam or river in their area. The government also gave a plan showing how the plant will look like.

#### *Support material*



#### Task:

As a physics learner,

- (a) Explain to Oming, and the people in the area how the plant works to produce electricity
- (b) How would address the concern, “People in that area say that this will not help them but just waste their land”?

**SECTION B**  
**(Attempt any one item from each part)**  
**Part 1**  
**ITEM III**

Mukene, a fellow physics learner bought shoes two months ago. He wears these pairs of shoes for at least two times a week. Now Mukene has realised that the shoe sole has worn out. Him and his friends called it friction, but no one had a clue what really happened for such to be possible. Wearing the same shoes heading to town, he slid for a short time, about a second but never fell down.

Mukene is 58kg and the surface over which he slid had a coefficient of friction 0.4.

**Task:**

As a learner of physics,

- (a) How can you explain to Mukene how the friction came about?
- (b) i) identify and explain the type of friction in the scenario.  
ii) Calculate the force of friction which cause the sliding.

**ITEM IV**

Ben is to roof his house at the end of the coming month. He has a ladder which is uniform and has a mass of 12kg and of length 3m. He wishes to make the ladder and on a rough ground and to lean against a smooth vertical wall at an angle of  $20^\circ$  to the horizontal. He is not sure whether this ladder will rest in equilibrium.

He wishes to know ;

- the reactions on the ground
- on the wall and

*Support material*



**Task:**

As a learner of physics, help Ben find the reactions the on the wall and on the ground.

**Part II**  
**ITEM V**

Dan wishes to travel a distance of 0.6km by bus to visit his uncle. He's travels with uniform acceleration from rest at a speed of  $60\text{ms}^{-1}$  in 2 hours. When he reaches his destination, he brakes uniformly to a halt in a distance of 42m.

He wishes to know;

- (a) (i) The acceleration and
- (ii) Distance of the first part of the journey

Also;

- (b) (i) Deceleration and
- (ii) time taken to stop the car.

**Task:**

As a physics learner

1. Derive all the equation to be used to solve Dan's queries
2. Help Dan get solutions to his problems.

**ITEM VI**

Two bicycle riders, A and B move at different destinations with A having a velocity of  $V_A$  and B with a velocity of  $V_B$ . A moves due east with velocity  $V_A$  and  $V_B$  moves due north. A is at a distance  $l_A$  before reaching path taken by B and B is at  $l_B$  before reaching path taken by A.

Given that;

$$V_A = 5\text{m/s}$$

$$V_B = 7\text{m/s}$$

$$l_A = 1\text{ m}$$

$$l_B = 20\text{m}$$

**Task:**

As a learner of physics,

- (a) Find the relative velocity of rider A with respect to B
- (b) (i) Derive an expression of closest distance of approach between A and B and show that it is given by,

$$distance = \frac{l_A V_B - l_b V_A}{\sqrt{V_A^2 + V_B^2}}$$

- (ii) Use the above expression to find the closest distance.