**Physics**
**Paper 2022**
**$1^1/_2$ hours**

# THE PHYSICS DEPARTMENT 2022

*Uganda Certificate of Lower Secondary Education*

**S.2 End of Year Assessment**

Physics

1 hours 30 minutes

## Fill in the required information below

| LEARNER'S NAME: | | STREAM: | |
|---|---|---|---|

| LEARNER'S NO. | | | | | STUDY GROUP'S NAME: | |
|---|---|---|---|---|---|---|

**THIS PAGE IS FOR EXAMINER'S USE ONLY**

Do not write in the boxes on this page. The examiner will use them to keep a record of your marks.

| Question | | | Marks | Comment |
|---|---|---|---|---|
| **SEC.A** | **1.** | | | |
| **SEC.B** | **2.** | **R** | | |
| | | **A** | | |
| Out of 10 marks | | **C** | | |
| | | **E** | | |
| | | **TOTAL MARKS** | | |

**INSTRUCTIONS**

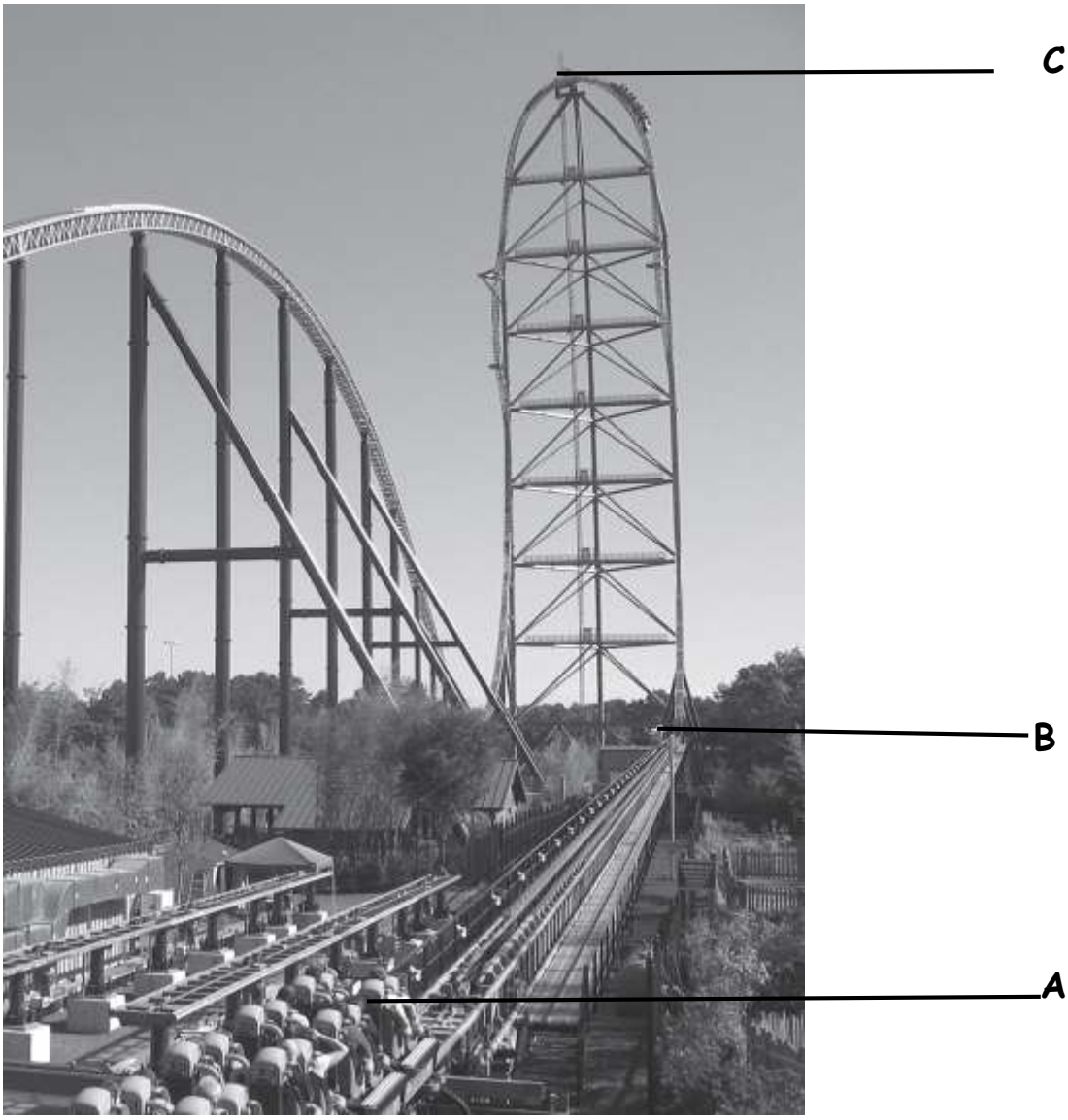
- Use the blue or black ink pen only
- Attempt **all** questions in Section A and B.

***Turn Over***

## SECTION A
## (Short response items)

**Question.1**

The photograph shows a type of rollercoaster. The car is launched from point **A** in the photograph, accelerates to point **B** and then rises over point **C**.




(a) Each loaded car has a mass of 2000 kg. **C** is 128 m above **B**.

(i) State the equation linking gravitational potential energy (P.E), mass (m), height (h) and acceleration due to gravity (g). ***(01 mark)***

(ii) Use the stated equation above to calculate the gravitational potential energy (P.E), gained by the car when it rises from **B** to **C** . ***(02 marks)***

(b) The car gains kinetic energy when work is done on it by the launching system between A and B. Assume there are no energy losses.

(i) State the minimum kinetic energy that the car must have at B for it to reach C. ***(01 mark)***

(iii) How is the kinetic energy gained related to the work done? ***(01 mark)***

(iv) Write down the equation linking work done (W), force (F) and distance (d). ***(01 mark)***

(v) The launching system provides a force of 32000N. use the equation above to calculate the length of the track needed between A and B for the car to reach C. ***(02 marks)***

(b) (i). When a car reached A, Sarah released a stone of mass 1kg down to the ground. State the energy changes that took place on the stone as it reaches the ground. ***(02 marks)***

(ii). Draw the graph of mechanical energy (M.E) against distance (d) from the top A, as the stone falls down. ***(02 marks)***

## SECTION B
## (Extended response)

**Question. 2**

You are the manager of the Coca cola Company. One day during the rainy season you went with a fully loaded Coca cola trucks in some village whose road is murram. The trucks skid, slide and get stuck in the mud.

(a). Suggest possible ways you would use to remove the truck from this position.

(b). Advise the driver on how to avoid this situation. ***(10 marks)***

***END***