



AITEL EXAMINATIONS BUREAU LIMITED
UGANDA CERTIFICATE OF LOWER CURRICULUM EDUCATION
END OF YEAR 2023
S.3 PHYSICS

TIME: 2 HOURS

ASSUME WHERE NECESSARY;

Acceleration due to gravity, $g = 10ms^{-2}$

FOR EXAMINER'S USE ONLY:

SECTION A	
SECTION B	
TOTAL SCORE	
TOTAL SCORE (%)	

SECTION A (20 MARKS)

Attempt all questions in this section

1. Light propagating from one medium to another of different optical densities suffers change of speed.

(a) What physics term is given to this phenomena (01 mark)

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(b) What laws govern the term in (a) above (02 marks)

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- (c) Light from air is made to strike the surface of alcohol of refractive index of 1.36. The incident light makes an angle of 20° with the normal at the point of incidence. What is the angle of refraction as the light passes the air-alcohol interface? (02 marks)

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2. There are **two** types of electric charges.

- (a) Name the charges (01 mark)

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- (b) State the law of electrostatics (01 mark)

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- (c) Briefly explain what happens when a plastic pen is rubbed with hair

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..... (03 marks)

3. The following table shows the data collected from S.3 physics lesson about Motion.

Use it to answer the questions

Name of member	Distance ran (m)	Time taken(s)
Munda	25	10
Kasekende	24	12

Using the knowledge of motion, who is faster? (05 marks)

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4. An aeroplane starts from rest and accelerates at 12ms^{-2} for **8 s** before take-off.

(a) Calculate the take-off speed of the aeroplane. (02 marks)

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(b) Calculate the minimum length of run-way required (03 marks)

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SECTION B (30 MARKS)

Attempt only 2 questions from this section

5. (a) What is meant by the terms **velocity** and **acceleration**? (02 marks)

(b) Engineer Busulwa initially driving at 25ms^{-1} on **ENTEBBE EXPRESS WAY** uniformly accelerates to 30ms^{-1} in **4 seconds**. He maintained this steady velocity for another **10 seconds**. He again accelerated uniformly to $V\text{ms}^{-1}$ at a rate of 2.5ms^{-2} in the next **4 seconds**. After seeing a mad person on the road, he instantly applies brakes and decelerates uniformly to rest in the last **2 seconds**

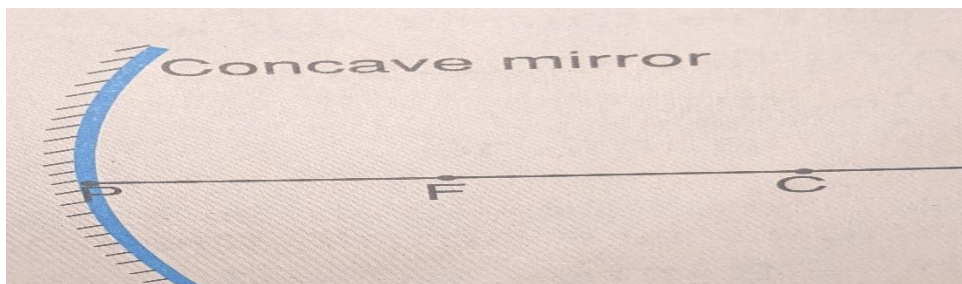
(a) Calculate the value of **V** (03 marks)

(b) Sketch the velocity-time graph for the motion described above (03 marks)

(c) Calculate the **total distance** covered (05 marks)

(d) Find the average speed (02 marks)

6. (a) The figure represents a concave mirror.



Name and **define** the parts labelled **F** and **C**. (04 marks)

(b) Nana stands 25cm in front of a concave mirror of focal length 10cm.

Using  to represent Nana and by scale ray drawing, determine the ;

(i) Position of nana's image from the mirror.

(ii) Magnification caused.

(iii) Nature of her image

(06 marks)

(c) You are provided with a **mirror holder**, a **concave mirror**, a **white screen** and a **half-metre rule**. As a physics student, briefly describe how you can experimentally determine the focal length of the mirror in a laboratory.

(03 marks)

(d) What are the practical applications of the mirror above in your daily life?

(02 marks)

7. (a) The solar system is composed of big, small and much smaller objects.

(i) Name any **four** components of the solar system. (02 marks)

(ii) Name the **force** that holds the components together. (01 mark)

(b) In the solar system, a planet is a celestial body that **moves around the sun in a define path and;**

- **Has sufficient mass to keep it in a round (spherical) shape**
- **Has "cleaned the neighborhood" around its path of debris and bolder.**

The solar system has **eight (8)** planets, which have the above qualities.

(i) Which name is given to the **path** in which a planet moves? (01 mark)

(ii) The planets are classified into **Terrestrial** (inner) planets and **Jovian** (outer) planets. Identify the planets in their respective classes. (04 marks)

(iii) Of recent, Pluto was disqualified from being a planet and re – classified as a **dwarf**. Pluto lies in the Kuiper Belt, which is full of **icy bodies** and **debris** out past Neptune. Pluto is very **small**, less dense and has a **small mass**. Using the above information about Pluto and the qualities of a planet, explain why Pluto was disqualified as a planet. (02 marks)

(c) All planets move around the sun in **elliptical paths**. The motion is both **rotational** and **revolution**. Rotation motion involves the planets **spinning about a fixed axis** and revolution motion involves a planet **moving around the sun**. One complete rotation is equal to **one day** and one complete revolution is equal to **one year**. With reference to planet earth;

(i) Draw diagrams to show rotational motion and revolution motion.

(02 marks)

(ii) Determine the time taken (in hours) by the earth to rotate once about its axis. (01 mark)

(iii) Determine the time taken (in hours) by the earth to revolve once around the sun (**1 day = 24 hours and 1 year = 365 days**) (01 mark)

(d) The moon is considered a bright **celestial** body in the solar system. Justify why it is not a **luminous** body. (02 marks)

END