Examination Number: _____ Name: _____

MARIST SECONDARY SCHOOL

2022 MALAWI SCHOOL CERTIFICATE MOCK II EXAMINATION

PHYSICS

Wednesday, 27/07/22 **PAPER I** **Time Allowed: 2 hours**
8:00-10:00 am

(100 marks)

Theory

Instructions

1. **This paper contains 12 printed pages. Please check**.
2. Fill in your Examination Number at the top of each page.
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. Answer **all** the thirteen questions in the spaces provided.
5. Use of electronic calculators is allowed.
6. The maximum number of marks for each answer is indicated against each question.

7. In the table provided on this page, **tick** against the question number you have answered

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

Turn over

Examination Number: _____ Name: _____

1a). What does the term **rectilinear propagation of light** mean?

_____

_____ **(1 marks)**

b). State any two properties of an image formed by a plane mirror

_____

_____

_____ **(2 marks)**

c). With the aid of a diagram, explain why apparent depth of a coin placed at the bottom of a basin filled with water appears to be higher than the actual depth.

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_____ **(7 marks)**

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2a). Why is an object moving at a uniform speed in a circular path said to be accelerating?

_____

_____

_____ **(2 marks)**

b). Define the radian

_____

_____ **(1 mark)**

c). A DVD in a DVD player rotates at 200 revolutions per minute (rpm). If its radius is 45mm, calculate:

(4 marks)

3a). Define the term **velocity ratio** in machines.

_____

_____ **(1 mark)**

Figure 1 below is a diagram of a pulley system being used to lift a mass.

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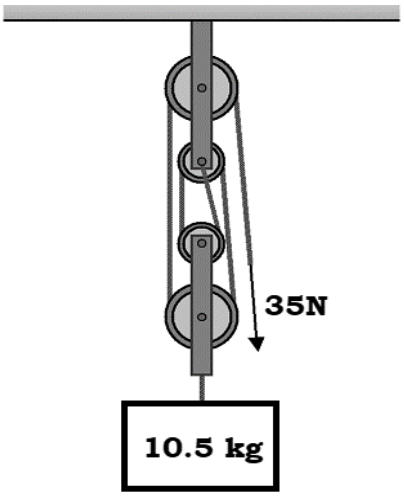

a). Find the Velocity ratio of the pulley system

(1 mark)

b). Calculate the efficiency of the pulley.

(4 marks)

c). State **two** ways of increasing the mechanical advantage of inclined planes

_____

_____

_____ **(2 marks)**

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4a). Differentiate Ohmic conductor and non-Ohmic conductor and give an example of each.

_____

_____

_____

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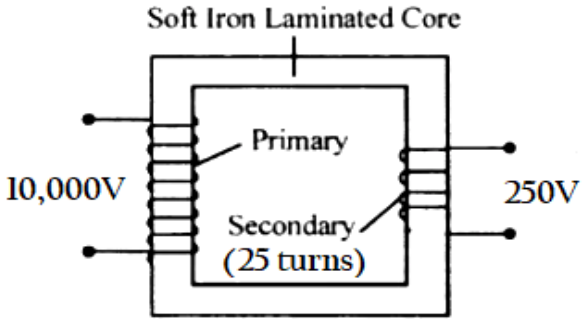
_____ **(4 marks)**

b). Explain what **electromagnetic induction** means

_____

_____ **(1 mark)**

c). Figure below shows a step-down transformer changes the potential difference of an alternating current from 10,000V to 250V. If it has 25 turns on its secondary coil, how many turns does it have on its primary coil?



(4 marks)

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d). State **three** causes of energy losses in transformers

_____

_____

_____

_____ **(3 marks)**

5a). State the principle of **conservation of linear momentum**

_____

_____

_____**(1 marks)**

b). A 5kg mass moving with a velocity of 19m/s collides with a 10kg mass moving with a velocity of 7m/s along the same line. If the two masses join together on impact, find the common velocity if they were moving.

(4-marks)

6a). Differentiate between **nuclear fission** and **nuclear fusion**

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_____

_____ **(2 marks)**

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b). Using a well-labelled diagram, describe how radioactivity is used in thickness control of paper in industries

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_____ **(6 marks)**

c). State any **three** causes of background radiation

_____

_____

_____ **(3 marks)**

7a). Define the term **electromagnetic spectrum**

_____

_____ **(1 mark)**

b). Describe a method by which each of the following may be detected

i). Infrared radiation

_____ **(1 mark)**

ii). Ultraviolet radiation

_____ **(1 mark)**

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c). State **any two** properties of electromagnetic waves

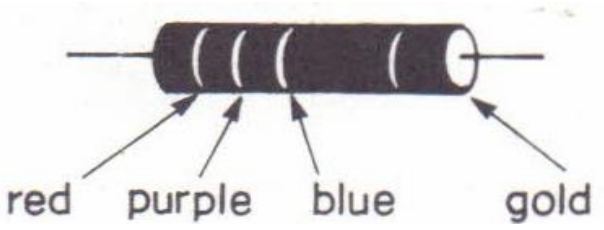
_____

_____ **(2 marks)**

d). A man standing between two parallel cliffs fires a gun. He hears the first echo after 1.5s and second echo after 2.5s. (i) What is the distance between the cliffs (ii) When does he hear the third echo? (Take speed of sound in air to be 336m/s)

(5 marks)

8a). Determine the resistance of a fixed resistor below using the colour coding method



(4 marks)

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b). State **three** factors that can be varied to change the resistance of a piece of nichrome wire apart from resistivity.

_____

_____

_____ **(3 marks)**

c). You are provided with two materials: a conductor and a non-conductor. Explain how you can differentiate the two using a positively charged electroscope.

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_____ **(6 marks)**

9a). Differentiate between **accuracy** and **precision**

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_____

_____

_____ **(2 marks)**

b). Mention any one instrument that would be used to measure each of the following

i. Depth of a blind hole

_____ **(1 mark)**

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ii. Volume of 10 drops of ethanol

_____ **(1 mark)**

iii. Interval between two drum beats

_____ **(1 mark)**

10a). Using kinetic theory of matter, define **a gas**

_____

_____ **(1 mark)**

b). What does the letters **STP** stand for under gas pressure?

_____

_____ **(1 mark)**

c). Describe an experiment that can be carried out to verify the Charles law.

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_____ **(10 marks)**

11a). Define the term **average speed**

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_____ **(1 mark)**

b). A truck delivering supplies to a construction site is late with the delivery. The truck covered the first 10000 meters of the trip in 600 seconds. How much time does the truck have to cover the remaining 4000 meters so its average speed is 20 m/s?

(5 marks)

END OF QUESTION PAPER!!