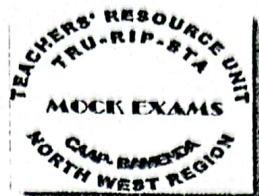


REPUBLIQUE DU CAMEROUN
Paix-Travail-Patrie

MINISTRE DES ENSEIGNEMENTS SECONDAIRES

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REPUBLIC OF CAMEROON
Peace-Work-Fatherland

MINISTRY OF SECONDARY EDUCATION

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MARCH 2025

The Teachers' Resource Unit and the Regional Inspectorate of Pedagogy, in collaboration with NWAPT	SUBJECT CODE NUMBER 0580	PAPER NUMBER 2
GENERAL CERTIFICATE OF EDUCATION REGIONAL MOCK EXAMINATION	SUBJECT TITLE PHYSICS	
ORDINARY LEVEL		

Time Allowed: TWO and a half hours
INSTRUCTIONS TO CANDIDATES

Mobile phones are NOT ALLOWED in the examination room.

Answer ALL Questions

SECTION I:

This section is designed to be answered in 1 hour.

SECTION II:

The questions in this section are paired. Answer ONLY the EITHER or the OR question. All questions carry equal marks. This section is designed to be answered in 1½ hours. All questions carry 20 marks.

For your guidance, the approximate marks for each part of a question are indicated in brackets.

You are reminded of the necessity for good English and orderly presentation in your answers.

In calculations, you are advised to show all the steps in your working, giving your answers at each stage.

Where necessary, assume the acceleration of free fall, $g = 10 \text{ ms}^{-2}$.

Calculators may be used.

SECTION I

1. (a) (i) State one property of a liquid on which the hydraulic machine functions. (1 mark)
 (ii) Give a reason why water is not suitable for use as a hydraulic liquid. (1 mark)
- (b) (i) Define pressure and state a unit in which it is measured. (2 marks)
 (ii) State two factors that will affect the pressure in a liquid. (2 marks)
 (iii) Calculate the pressure due to water at a point 6m below the surface of the water. (The density of water is 1000 kg m^{-3}) (2 marks)
2. Two children sit on a seesaw made of a uniform plank pivoted in the middle as shown in figure 1 below.

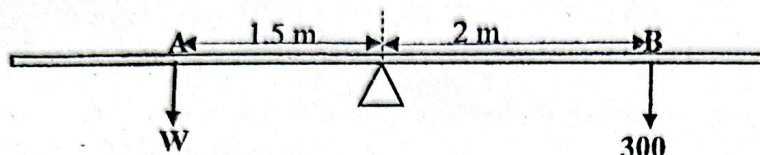


Figure 1

- (i) State the principle of moments. (2 marks)
 (ii) Calculate the moment of B about the pivot. (2 marks)
 (iii) Determine the weight W, of A if the system is in equilibrium. (2 marks)
3. (a) Define the following and give an example of each;
 (i) Insulator (2 marks)
 (ii) Conductor (2 marks)
- (b) Distinguish between potential difference (Pd) and electromotive force (emf). (2 marks)
4. (a) A toy car A, of mass 3 kg, moving towards the right along a smooth level surface with a velocity of 5m/s collides with another toy car of mass 6 kg, moving in the opposite direction at 2 m/s. The two stick together and move off with a common speed v.
 (i) State the law of conservation of linear momentum. (2 marks)
 (ii) Calculate the value of their common speed v. (2 marks)
 (iii) In which direction will the toy cars move after collision? (1 mark)
- (b) Describe how the principle of conservation of momentum is applied in a space craft or a garden spray. (3 marks)
5. (a) In an electric circuit, it is observed that a steady current of 2.5A flows through the circuit for 30 seconds.
 (i) Which instrument can be used to determine the type of charge? (1 mark)
 (ii) Determine the quantity of charge that has passed a point in that circuit. (2 marks)
 (iii) Calculate the number of electrons that have passed a point in the circuit. (2 marks)
- (b) Give one difference between an intrinsic and an extrinsic semiconductor. (2 marks)
6. Figure 2 below shows a ray of light passing from air into clean water.

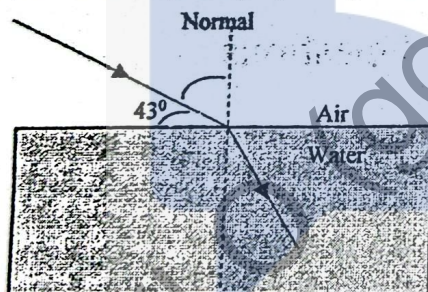


Figure 2

- (i) Define refraction. (2 marks)
 (ii) Determine the angle of incidence. (1 mark)
 (iii) Given that the refractive index of glass is 1.5, calculate the angle of refraction. (2 marks)

SECTION II

Answer all questions choosing, either (a), (b) and (c) OR (d), (e) and (f) of each question.
 Answer EITHER 7 (a), (b) and (c)

7. (a) (i) Define temperature and state its unit of measurement. (2 marks)
 (ii) Describe an experiment to determine the specific heat capacity of a liquid.
 Your description should include
 - a labelled diagram
 - the procedure you will follow
 - the data you will collect
 - how you will use your data to obtain the specific heat capacity
 - any precaution taken to improve the result. (7 marks)
 (iii) Give one practical use of a named liquid due to its high or low specific heat capacity. (2 mark)
- (b) Figure 3 shows an object placed in front of a convex lens.

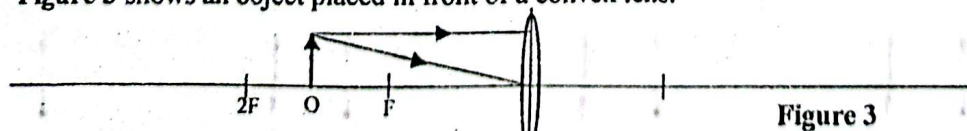


Figure 3

- (i) Copy and complete the diagram using rays to show how the image is formed. (2 marks)
 (ii) Give two characteristics of the image formed. (2 mark)
 (iii) Name one optical instrument that makes use of this arrangement. (1 mark)
- (c) (i) Name two types of circuits used in house wiring. (2 marks)
 (ii) Give two ways through which the lightening conductor protects an installation. (2 marks)

OR 7 (d), (e) and (f).

- (d)
 (i) Define density and state its unit of measurement. (2 mark)
 (ii) Describe an experiment to determine the density of an irregularly shaped stone.
 Your description should include
 - a labelled diagram
 - the procedure you will follow
 - the data you will collect
 - how you will use your data to obtain the density of the stone
 - any precaution taken to improve the result. (7 marks)
 (iii) Give one practical use of a named material due to its density. (2 marks)

- (e) Figure 4 shows a solenoid made of a soft iron core XY, and a coil. Current flows through the coil as indicated.

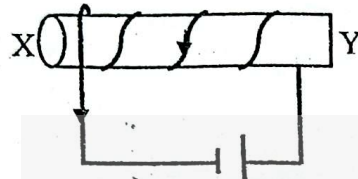


Figure 4

- (i) Copy and complete the diagram to indicate the poles of the iron core and the magnetic flux around the solenoid. (3 marks)
 (ii) State one factor that will affect the strength of the magnetic field. (1 mark)
 (iii) Name a device that uses this setup. (1 mark)
- (f) (i) Name two safety devices used in house wiring. (2 marks)
 (ii) Give two advantages of connecting bulbs in parallel than in series. (2 marks)

Answer EITHER 8 (a), (b) and (c)

8. (a) (i) Define electric current and state a unit in which it is measured. (2 marks)
 (ii) Name two ways by which current can be supplied. (2 marks)
 (iii) Which instrument is used to measure current? (1 mark)

- (b) In an experiment to verify Ohm's law, students working in a group varied the potential difference, V , across a certain piece of wire and measured the corresponding current, I , flowing through that wire. They collected the following data.

V/V	0	2	4	6	8	10
I/A	0	2.2	3.8	5.8	7.6	9.6

- (i) State ohm's law. (2 marks)
 (ii) Plot a graph of V on the y-axis against I on the x-axis. (5 marks)
 (iii) Determine the slope of your graph. (2 marks)
 (iv) What physical quantity does this slope represent? (1 mark)
- (c) Figure 5 shows two bar magnets placed close to each other.



Figure 5

- (i) What name is given to the force between the magnets? (1 mark)
 (ii) State two factors which can affect the size of this force. (2 marks)
 (iii) Copy and complete the diagram to show the magnetic field pattern between these two magnets. (2 marks)

OR 8 (d), (e) and (f).

- (d) (i) Define the term force and state a unit in which it is measured. (2 marks)
 (ii) Forces can be classified into two groups, Name them. (2 marks)
 (iii) Which instrument is used to measure force? (1 mark)
- (e) In an experiment to test Newton's second law of motion, a group of students varied the force (F) on a toy car placed on a smooth horizontal surface such that it accelerates from rest. For each applied force, the corresponding acceleration (a) was calculated. They were able to collect the following data.

F/N	0	4	8	12	16	20
$a/m\ s^{-2}$	0	3.2	6.4	9.6	13.2	16.0

- (i) State Newton's second law of motion. (2 marks)
 (ii) Plot a graph of F/N on the y-axis against $a/m\ s^{-2}$ on the x-axis. (5 marks)
 (iii) Determine the slope of your graph. (2 marks)
 (iv) What physical quantity does this slope represent? (1 mark)
- (f) Figure 6 shows two charged spheres A and B hanging close to each other from separate strings of the same length.

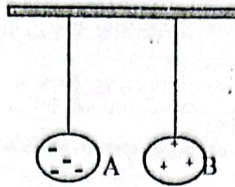


Figure 6

- (i) What name is given to the force acting between the spheres? (1 mark)
- (ii) State two factors that can affect the size of this force. (2 marks)
- (iii) Copy and complete the diagram (using arrows) to show the direction of the force named above, acting on each sphere. (2 marks)

Answer EITHER 9 (a), (b) and (c)

9.

- (a) A uranium – $^{239}_{92}\text{U}$ nuclide decays by emitting one alpha particle and one beta particle to form a new element Q. The process is called **transmutation**.

- (i) Define the term transmutation? (2 marks)
- (ii) What do the numbers 239 and 92 represent? (2 marks)
- (iii) Write down the equation representing this decay. (2 marks)

- (b) Figure 7 shows the velocity – time graph of a model car on a straight level road during a test.

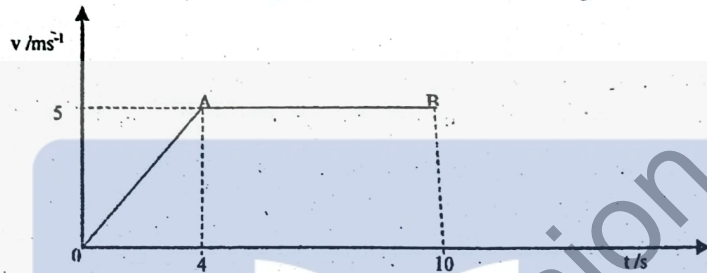


Figure 7

- (i) Define velocity and state its SI unit of measurement. (2 marks)
 - (ii) Describe the motion of the car along OA and AB. (2 marks)
 - (iii) Determine the acceleration of the car between O and A. (2 marks)
 - (iv) Calculate the distance covered by the car in going from A to B. (2 marks)
 - (v) What was the maximum velocity attained by the car in this test? (1 mark)
- (c)(i) Define the term thermometric property. (2 marks)
 - (ii) Give the thermometric properties used in a named thermometer. (2 marks)
 - (iii) State one characteristic of a good thermometric property (1 mark)

OR 9 (d), (e) and (f).

- (d) A certain radioactive isotope represented by $^{24}_{12}\text{X}$, decays by emitting one radioactive particle to produce new element, represented by $^{20}_{10}\text{Y}$.

- (i) What are isotopes? (2 marks)
- (ii) Write down the symbol of the emitted particle. (2 marks)
- (iii) What happens to the atomic number and mass number of the daughter nuclide compared with the parent if a beta particle is emitted? (2 marks)

- (e) Figure 8 shows the displacement – time graph of a transverse wave generated by a vibrator of frequency 50 Hz on the surface of water in a ripple tank.

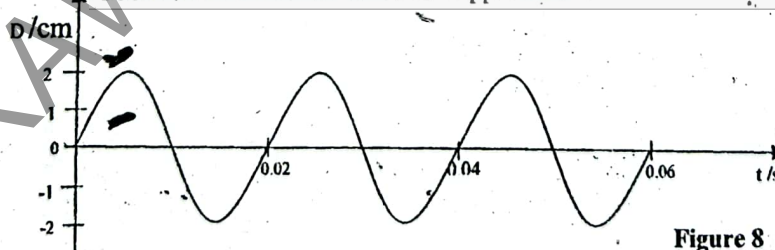


Figure 8

- (i) Define a transverse wave and give an example. (2 marks)
 - (ii) At what frequency will the particles of the water in the tank be vibrating? Explain. (2 marks)
 - (iii) Determine the period of the generated wave. (2 marks)
 - (iv) What is the value of the amplitude of this wave? (1 mark)
 - (v) The wave then crosses into a shallow part of the tank. State what will be observed with the amplitude and the wavelength respectively in the shallow part. (2 marks)
- (f) (i) State Hooke's law. (2 marks)
 - (ii) Define elastic limit. (2 marks)
 - (iii) Name one material which obeys Hooke's law. (1 mark)

END