

0580/2/2022

PHY O/L

**SOUTH WEST REGIONAL MOCK EXAMINATION  
GENERAL EDUCATION**

**THE TEACHERS' RESOURCE UNIT (TRU)  
IN COLLABORATION WITH**

**THE REGIONAL INSPECTORATES OF PEDAGOGY AND**

**THE SUBJECT TEACHERS' ASSOCIATIONS (STA)**

FRIDAY, 01/04/2022 (Afternoon)

ORDINARY LEVEL

Subject Title	PHYSICS
Paper Number	Paper 2
Subject Code Number	0580

**Time Allowed: Two and a half Hours**

**INSTRUCTIONS TO CANDIDATES:**

*Answer ALL questions.*

*Section 1 is designed to be answered in 1 hour and section 2 in 1½ hours.*

*You are advised to divide your time accordingly.*

*In section II answer EITHER the a, b and c OR the d, e and f of each question.*

*For your guidance the approximate mark for each part of a question is 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 answer at each stage.*

*Where necessary assume:*

*-the acceleration of free fall,  $g = 10 \text{ m s}^{-2}$*

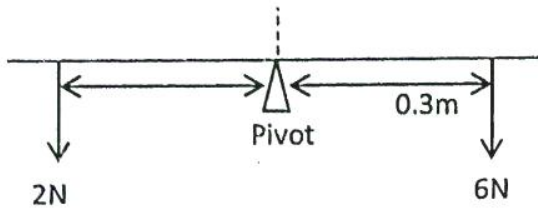
*-the speed of light in air,  $c = 3 \times 10^8 \text{ m s}^{-1}$*

*-the charge on an electron,  $e = 1.6 \times 10^{-19} \text{ C}$*

**Calculators are allowed**

Answer ALL questions

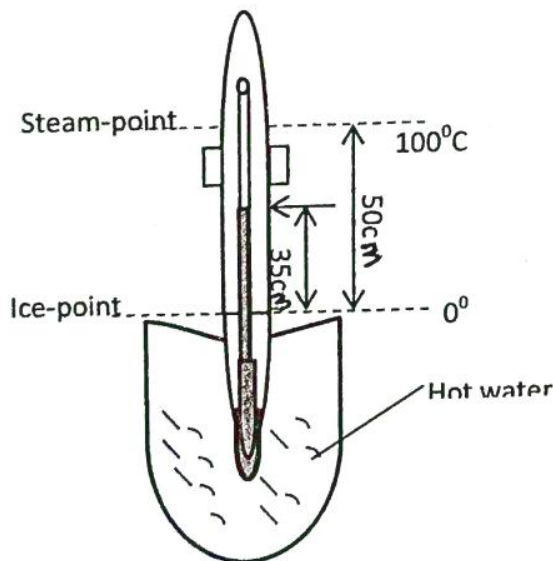
1. (a) Give one example of a non-contact force (1mark)
- (b) A bag of cocoa of weight 500 N is pulled horizontally by a resultant force of 100 N. Calculate its acceleration (3marks)
- (c) Figure 1 shows a plank pivoted at a point such that it is balanced by a 2 N force and a 6 N force as shown below



- (i) State the conditions necessary for equilibrium to hold. (2marks)
- (ii) Calculate the moment of the 6 N force about the pivot (2marks)
- (iii) Determine the distance of the 2 N force from the pivot (1mark)
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2. (a) Define elasticity (1mark)
- (b) (i) What do you understand by elastic limit? (2marks)
- (ii) Give one example of a device that functions based on Hooke's Law (1 mark)
- (iii) A spring of length 10 cm is stretched to a length of 15 cm by a force of 20 N. What force will give it an extension of 8 cm? (3marks)
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3. (a) Distinguish between renewable and non-renewable energy sources. State an example in each case. (4marks)
- (b) A ball of mass 2 kg is released from a height of 5m above the ground. Calculate the velocity with which it hits the ground. (2marks)

4. Figure 2 shows the structure of an un-calibrated mercury-in-glass thermometer.

Figure 2



- a) Which feature of the thermometer determines:
- (i) Accuracy (1mark)
- (ii) Sensitivity (1mark)
- (iii) Quick response (1mark)
- b) Calculate the temperature of the hot water using the information on the diagram. (3marks)

- (iii) Explain why, if the portion of the circuit A to B is replaced by a piece of plastic, and the switches are on, the bulb does not light. (2marks)
- (c) (i) A form 5 student uses two 60W bulbs for 5 hours each day for 30 days. Calculate the electricity bill if ENEO charges 60 frs per kWh (1unit). (4marks)
- (ii) What is she paying for to ENEO. (1mark)
- (iv) State which type of circuit is used for house wiring and explain why. (2marks)

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

9. (d) (i) Name a material which is most suitable for making a permanent magnet and one for the core of a transformer (2 marks)
- (ii) Give two advantages of an electromagnet over a permanent magnet (2marks)
- (iii) Name one device which operates only with a.c. current (1mark)
- (e) Figure 7 shows a hollow coil, C, with many turns mounted on a wooden base and connected to a centre zero galvanometer, G.

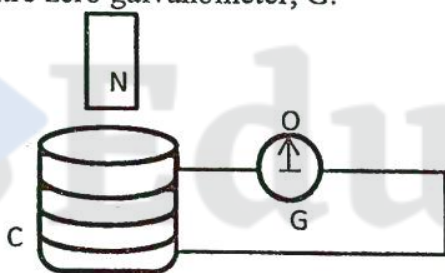


Figure 7

- (i) State and explain what is observed on the pointer of the galvanometer when the magnet is lowered into the coil. (3 marks)
- (ii) State and explain what happens to the pointer of the galvanometer when the magnet is removed. (3marks)
- (iii) Explain why, if the magnet is held stationary in the coil, nothing happens to the pointer of the galvanometer. (2marks)
- (f) A transformer is constructed with a primary coil of 400 turns and a secondary coil of 200 turns.
- (i) If the primary coil is connected to a 240 V a.c. mains, determine the secondary voltage. (2marks)
- (ii) Calculate the efficiency of the transformer if the primary current is 3 A and the secondary current is 5 A. (3marks)
- (iii) State and explain what type of transformer is found in toy electric cars. (2marks)