

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

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| 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, $c = 3 \times 10^8 \text{ m s}^{-1}$

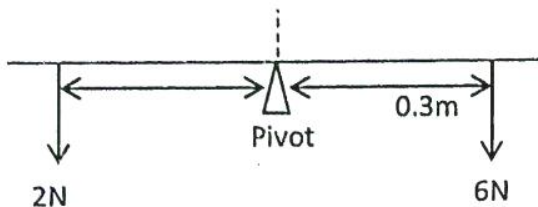
-the charge on an electron, $e = 1.6 \times 10^{-19} \text{ C}$

Calculators are allowed

Section 1 (1hour)

Answer ALL questions

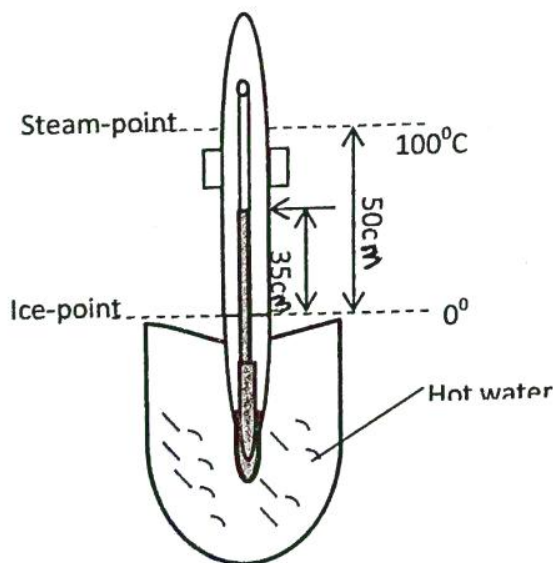
1. (a) Give one example of a non-contact force (1mark)
- (b) A bag of cocoa of weight 500 N is pulled horizontally by a resultant force of 100 N. Calculate its acceleration (3marks)
- (c) Figure 1 shows a plank pivoted at a point such that it is balanced by a 2 N force and a 6 N force as shown below



- (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.

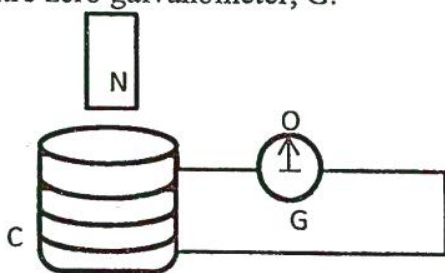


Figure 7

- (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)