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PHYSICS

Form Two

(Theory)

July 2015

Time: 2 Hours

 **EXAM FORM TWO**

Kenya Certificate of Secondary Education (K.C.S.E)

**INSTRUCTIONS TO CANDIDATES**

* The paper consists of TWO sections A and B.
* Answer all the questions in section A and B in the spaces provided
* All working MUST be clearly shown
* Non-programmable silent calculators and KNEC mathematical tables may be used.

FOR EXAMINER’S USE ONLY

|  |  |  |  |
| --- | --- | --- | --- |
| Section | Question  | Maximum Score | Candidate’s Score |
| A | 11-21 | 50 |  |
| B | 22232425 | 12151112 |  |
| TOTAL SCORE |  | 100 |  |

This paper consists of 13 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.

**SECTION A ( 50 MARKS )**

1. Figure 1 shows the change in volume of water in a measuring cylinder when an irregular solid is immersed in it.

 

Given that the mass of the solid is 567g, determine the density of the solid in g/cm3. (Give your answer correct to 2 decimal places.) (3 marks)

1. State **two** properties of a liquid that is considered during the construction of a liquid – in – glass thermometer. (2mks)
2. Explain why steel is selected as a better material for reinforcement for a concrete beam.

 (2mks)

4 (a) What is meant by the centre of gravity of an object? (2mk)

* + 1. A uniform metre rule is in equilibrium on a knife-edge placed at 40cm mark as shown on figure 2 when a weight of 60N and 40N is placed at 10cm and 60cm mark respectively. Determine the weight of the metre rule. (3mks)

10cm 40cm 60cm

 60N 40N

5. Explain why soft iron keepers are suitable for storing magnets (2mks)

6. Fig 2 below shows a conductor carrying current placed in the magnetic field of two magnets. Complete the diagram by showing the field pattern and the direction of force F that acts on the conductor (2mks)

**Figure 2**

 7. State two quantities that are used to determine whether accumulator require recharging or not (2mks)

1. A body is acted upon by a force of I0N towards the right hand side and 6N towards the left hand side. What is the resultant force? (2mks)
2. The difference between the ice point and steam point on a liquid thermometer is 30cm. What temperature is recorded when the mercury thread is 12cm. (2mks)
3. A steel needle when placed carefully on water can be made to float. When a detergent is added to the water it sinks. Explain this observation. (2 marks)
4. When dust particles are suspended in water and observed through microscope, they are seen to move in random manner. Explain this observation. (2 marks)
5. Explain why a glass container with thick walls is more likely to crack than one with a thin wallwhen a very hot liquid is poured into it (2mks)
6. The figure below shows a small toy boat floating in water in a basin. **P** and **Q** are two points near the toy.



When a drop of kerosene is introduced in water at point Q, the toy is observed to move towards P. Explain this observation. (2mks)

1. The figure below shows the reading of micrometer screw gauge with a metal sphere of mass 1.75g placed between its jaws .The readings on the gauge when the jaws were fully closed without the sphere was 0.012cm. What is the volume of the sphere? (2marks)



1. State two factors that reduce the stability of a vehicle while going round a banked road.
2. marks)
3. Which is easier to balance on a finger tip; a glass which is upright or a glass which is inverted with a finger inside? Given a reason. (2marks)
4. The figure 3 shows a ray of light incident on a mirror.

 **Fig.3**

 Determine the angle of reflection when the mirror is rotated 10° anticlockwise. (2mks)

1. Explain why an increase in temperature increases Brownian motion (2mk)
2. Which glass among the two glasses in fig 3 is more stable. (1mk)

 sand empty glass

 (a) (b)

 Fig 4

 (i) Give reason for (i) above. (2mk)

1. **Figure 5** shows two spherical materials one an insulator while the other a conductor. Negative charges are introduced at point A by contact method in each case.

conductor

insulator

 **Figure 5**

 A

 A

On the same figure indicate the final position of the charges. Explain your answer. (4mk)

1. State any four differences between mass and weight (4mks)

**SECTION B ( 50 MARKS )**

1. A concave mirror and an illuminated object are used to produce a sharp image of the object on a screen. The object distance ( U ) and image distance ( V ) are given below

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Object distance (cm) | 80 | 26.5 | 22.5 | 21.5 | 20 |
| Image distance (cm) | 20 | 40 | 55 | 72 | 88 |
| U-1 |  |  |  |  | 0.050 |
| V-1 |  |  | 0.018 |  |  |

 (i) Fill in the gaps in the table above (2mks)

 (ii)Plot a graph of $\frac{1}{u}$ against $\frac{1}{v}$ (4mks)

 (iii) Determine the value of $\frac{1}{f}$ from the graph ( 2mks)

 (iv) State any TWO properties of images formed by concave mirrors ( 2mks)

 (v) State any two areas where concave mirror are used (2mk)

1. a) State any **TWO** qualities of a liquid which can be used in an experiment to determine the size of a molecule (2 marks)

b) In an experiment to estimate the diameter of an oil molecule, an oil drop of diameter 0.05cm spreads overa circular patch whose diameter is 20cm:-

Determine the:-

1. Volume of the oil drop. (2 marks)
2. Area of the patch covered by the oil. (2 marks)
3. Diameter of the oil molecule. (3 marks)

c) State:-

1. Any **two** assumptions made in b(ii) above. (2 marks)
2. **Two** possible sources of error in this experiment. (2 mks)

d) State **one** reason why it is necessary to sprinkle chalk dust on to the water surface. (2 marks)

1. The following set up was used by a form 1 student to observe smoke particles in the smoke- cell experiment.

 Microscope Eye piece Smoke cell

Spotlight

Figure 6

1. State Brownian motion ( 2mk)
2. State the observations made in the experiment. (2 mks)

 c) Explain the observations. (2 mks)

 d) Explain the purpose of

 i) The microscope (1 mk)

 ii) The spotlight (2 mk )

 iii) The smoke (2 mk )

1. (i) State the law of electrostatic charges (2mk)

(ii) State the **THREE** methods of charging a conductor (3mks )

1. In the diagram below shows a gold-leaf electroscope. Use it to answer the questions that follows

 A

case E

 F B

glass window D

1. Name the parts labeled (3mks)
2. A
3. **B**
4. **C**
5. **D**
6. **E**
7. **F**
8. what is the function of the following parts (3mks)

 A -

C –

Casing **–**

(c ) Briefly explain how you can charge a conductor negatively by induction (3mk)