**Name**: **……………………………………………………….Adm. No……………..Class………**

**232**

**FORM TWO**

**PHYSICS EXAM**

*2 hours*

**SET 3**

**FORM TWO**

**INSTRUCTIONS TO CANDIDATES**

* *This paper consists of* ***16*** *questions.*
* *Answer* ***ALL*** *the questions in the spaces provided.*
* ***ALL*** *working* ***MUST*** *be clearly shown.*
* ***ALL*** *numerical answers* ***MUST*** *be expressed in decimal forms.*

**For Examiners use only**

|  |  |  |
| --- | --- | --- |
| Question | Maximum  Score | Candidate’s  Score |
| **1 - 16** | **70** |  |

**The paper consists of 9 printed pages.**

***Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.***

***Answer all the questions in this paper in the spaces provided***

1. The diagram below shows a micrometer screw gauge with an error of negative 0.015 cm.

**0**

**20**

**15**

**5**

**25**

Record the reading shown on the micrometer screw gauge. **(2 marks)**

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1. Identify the state of equilibrium for each body shown in the figure (a) and (b) below. **(2 marks)**

(a) (b)

1. …………………………………………………
2. …………………………………………………
3. You have been given a simple bar magnet. You are also given a string.
   1. How can you easily identify the polarities of the magnet? **(2 marks)**

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* 1. Once you have identified these polarities, you are presented with an unmagnetised piece of iron. You are also given another bar magnet. The poles of this magnet are not identified. How will you identify which of the two new bars is a magnet? **(3 marks)**

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1. A rod placed on a light, frictionless table is acted on by two equal forces that are in opposite directions and are not in equilibrium. State the effects of the forces on the rod. **(2 marks)**

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1. (a) Define **moment of a force** and state its **SI** unit. **(2 marks)**

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(b) Explain why it is easier to loosen a tight nut using a spanner with a long handle than one with a short handle. **(1 mark)**

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1. One of the extremely light springs shown on the right stretches by 12mm when a mass of 60g exclusively hangs on it. The connecting horizontal bars have a mass of 6g each.

60 g

If the mass at the bottom of the arrangement is 60g, calculate the following.

* 1. The extension e1 of the topmost spring. **(2 marks)**

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* 1. The extension e2 of the next 2 springs. **(2 marks)**

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* 1. The total extension of the spring combination **(2 marks)**

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1. **(i)** State the **principle of moments**.  **(1 mark)**

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**(ii)** The diagram below shows a uniform metre rule pivoted at its centre and balanced by the forces shown.

0.6 N

1.4 N

0.4 N

F

0.1 m

0.1 m

0.3 m

Determine the value of force F. **(4 marks)**

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1. The figure below shows a conductor carrying current through a magnetic field.

N

S

Sketch the resultant magnetic field between the poles of the bar-magnet. And the direction at which the conductor moves **(3 marks)**

1. The diagram below shows two nails suspended in a solenoid. When a direct current is passed through the solenoid, state and explain what is observed. **(3 marks)**

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1. A candle is lit and placed on a level bench as shown in figure 4 below.

State and explain how the stability of the candle changes as it continues to burn. **(2 marks)**....................................................................................................................................................................................................................................................................................................................................

1. The narrow beam of light shown below strikes the plane mirror at the angle shown. If the mirror is rotated through an angle of 15o clockwise;

35o

1. By how much does the reflected beam rotate? **(1 marks)**

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1. Calculate the new angle of reflection. **(2 marks)**

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1. Two manometers S and T contain liquid Y and water respectively at the same level. They are then connected to a thistle funnel covered with a rubber membrane as shown below.

h

20 cm

16 cm

Liquid Y

Thistle

funnel

Dilute sulphuric acid

Water

When the thistle funnel is lowered into a beaker containing a dilute Sulphuric acid of density 1250 kgm-3, the heights h1 and h2 are 20 cm and 16 cm respectively.

Determine the:

1. Ratio of density of liquid Y to that of water. **(2 marks)**

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1. Depth h of the thistle funnel below the surface of the dilute Sulphuric acid. **(3 marks)**

*(Take density of water = 1000 kgm-3 and g = 10 Nkg-1)*

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1. (a) State any **two** uses of a convex mirror. **(2 marks)**

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(b) A diverging mirror of focal length **18 cm** produces an image on its axis **12 cm** away from the mirror. If the image is **5 cm** high, determine:

(i) The object distance.  **(3 marks)**

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(ii) The height of the object. **(3 marks)**

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1. State Hooke’s law. **(1 mark)**

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1. One end of a piece of rubber was fixed on a rigid support and the other end pulled with a force of varying magnitude. The graph below shows the relationship between the force (N) and the extension (cm)



Using the graph, determine

1. The stretching force at the elastic limit. **(2 marks)**

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1. The constant of elasticity for the rubber. **(2 marks)**

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1. Suppose two identical rubbers were used in series instead of one what would have been.
   1. The stretching force at the elastic limit **(1 mark)**

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* 1. The elasticity constant for the combined rubbers **(3 marks)**

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1. The diagram shows a simple voltaic cell and the direction of the current.

A

B

C

1. Label the parts marked A, B and C. **(3 marks)**

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1. State what happens at **(2 marks)**
2. A

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1. C

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1. Name the effect that occurs at (i) and at (ii) **(2 marks)**

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1. It is observed that bulb glows and goes off immediately. How can it be made to light again for a short while. **(1 mark)**

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1. What two modification can be done on this cell so as to make it produce larger current and for long time. **(2 marks)**

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1. A sharp needle is placed on top of an uncharged electroscope.

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1. When a positively charged rod is held close to but not touching the needle, a deflection is seen. Explain how the deflection arises. **(2 marks)**

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1. When the positively charged rod is now removed, the deflection reduces slightly. Explain why this new deflection remains. **(2 marks)**

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