** MARANDA HIGH SCHOOL**

**Kenya Certificate of Secondary Education**

 **MOCK EXAMINATIONS 2022**

**232/1 Physics Paper 1**

 **September, 2022 Time: 2 Hours**

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

**Class**: ………………**Candidate’s** **Signature**: ………..…….. **Date: 7th September, 2022**

#  Time: 10.45AM -1.45PM

#  *Instructions to Candidates*

1. *Write your* ***name, admission number*** *in the spaces provided above.This paper consists of* ***TWO*** *sections.*
2. *Answer* ***ALL*** *the questions in sections* ***A*** *and* ***B*** *in the spaces provided.*
3. ***ALL*** *working* ***MUST*** *be clearly shown.*
4. *Non-programmable silent electronic calculators and KNEC mathematical tables may be used.*
5. ***Candidates should check the question paper to ascertain that all the 12 pages are printed as indicated and that no questions are missing****.*

# For Examiner’s Use Only

|  |  |  |  |
| --- | --- | --- | --- |
| **Section** | **Question** | **Maximum Score** | **Candidate’s Score** |
| **A** | **1 – 12** | **25** |  |
| **B** | **13** | **12** |  |
| **14** | **09** |  |
| **15** | **12** |  |
| **16** | **14** |  |
| **17** | **08** |  |
| **Total Score** | **80** |  |

**SECTION A (25 MARKS)**

***Answer all questions in this section in the spaces provided:***

1. **Figure 1** shows a section of an un-graduated vernier calipers.



 Insert division on the scales to represent a reading of 2.25cm (1mark)

1. Explain why a person would jump higher on earth than on Jupiter. (2marks)

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1. A mercury thermometer with its fix points incorrectly marked has its reading at pure melting ice as -0.60C and in steam at standard atmospheric pressure as 101.40C.Calculate the correct temperature when it reads 600C. (2marks)

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1. State two ways of increasing the surface tension of a liquid. (2marks)

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1. **Figure 2** shows three identical springs and have negligible weights. The extension produced on the system of the spring is 40cm.

# Figure 2

Determine the spring constant of each spring. (2marks)

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1. An oil drop of radius 0.35mm when placed in water spreads out to form a circle of radius 35cm.Using this information:
	1. Estimate the size of the oil molecule. (2marks)

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* 1. State any one assumption you made in your calculation. (1mark)

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1. **Figure 3** shows a beam balance made of concrete and reinforced with steel.



Using a diagram, show the shape of the beam when heated up. (1mark)

1. a) State Newton’s second Law of motion. (1mark)

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b) **Figure 4** shows two trolleys one of mass 6kg moving with a velocity of 2m/s and the other of mass 10kg travelling at a velocity of 0.5m/s.

# Figure 4

The trolleys were moving in the directions shown. Find their common velocity, if they moved together after collision. (3marks)

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1. A student blew air into a horizontal straw in the direction shown in the **figure 5**.



# Figure 5

Explain what was observed in the vertical straw. (2marks)

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1. A form three student threw a stone vertically upwards. Sketch in the space below the velocity time graph for the body until it falls on the ground. (2marks)
2. **Figure 6** shows a uniform Meter rule of Weight 2N with two weights 0.36N and 0.24N suspended from its ends.



# Figure 6

Determine how far from the 0.36N weight a pivot should be placed in order to balance the meter rule. (3marks)

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1. Give a reason why water is not suitable as a barometric liquid. (1mark)

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**SECTION B: (55 MARKS)**

***Answer ALL questions in the spaces provided***

1. (a) **Figure 7** shows a set-up that may be used to verify pressure law.

75 25

50

0

 Pressure gauge

Stirrer

thermometer

Hot Water

Glass flask

Dry air

# Figure 7

1. State the measurements that should be taken in the experiment. (2marks)

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1. Explain how the measurements in (i) above may be used to verify pressure law. (3marks)

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1. A column of air 26 cm long is trapped by mercury thread 5.0cm long as shown in the **figure 8 (a)** . When the tube is inverted as in **figure 8(b)** the air column becomes 30 cm long.



 What is the value of atmospheric pressure? (3marks)

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1. A steel cylinder of capacity 0.5m³ contains nitrogen at a pressure of 30,000Pa when the temperature is 27C. What will be the pressure of nitrogen if it is allowed to flow into another cylinder of capacity 9.5m³ with the temperature reduced to -23C? (3marks)

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1. State the difference between the temperature in Kelvin scale and Celcius scale. (1mark)

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1. (a) Define the term specific heat capacity. (1mark)

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1. A block of metal of mass 150g at 100C is dropped into a lagged calorimeter of heat capacity 40Jk-1 containing 100g of water at 25C. The temperature of the resulting mixture is 34C. (Specific heat capacity of water = 4200Jkgˉ¹). Determine;
	1. Heat gained by calorimeter. (2marks)

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1. Heat gained by water. (2marks)

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1. Heat lost by the metal block. (1mark)

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1. Specific heat capacity of the metal block. (3marks)

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1. (a)The moon goes round the earth at a constant speed. Explain why it is true to say the moon is accelerating. (1mark)

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1. **Figure 9** shows a pail of water being swung in a vertical circle.



# Figure 9

Explain why the water does not pour out when the pail is at position **A**. (1mark)

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1. A string of negligible mass has a bucket tied at the end. The string is 60cm long and the bucket has a mass of 45g. The bucket is swung horizontally making 6 revolutions per second. Calculate:
	1. the angular velocity. (2marks)

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* 1. the angular acceleration. (3 marks)

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* 1. the tension on the string. (3marks)

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* 1. the linear velocity. (2marks)

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1. (i) What is meant by perfectly inelastic collision. (1mark)

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1. A minibus of mass 1600kg travelling at a constant velocity of 20mls collides with a stationary car of mass 800kg. The impact takes 2 seconds before the two moves together and come to rest after 15 seconds. Determine.
	1. The common velocity. (2marks)

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* 1. The distance moved after the impact. (2marks)

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* 1. The impulse force. (3marks)

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1. A man uses the inclined plane to lift a 50kg load through a vertical line height of 4.0m. The inclined plane makes an angle of 30 with the horizontal. If the efficiency of the inclined plane is 80%, determine.
	1. The effort needed to move the load up the plane at a constant velocity. (3marks)

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* 1. The work done against friction in raising the load through the height of 4.0m. (Take g = 10N/kg). (3marks)

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1. i) State the law of floatation. (1mark)

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ii) **Figure 10** shows a piece of aluminum suspended from a string and completely immersed in a container of water. The mass of the aluminium is 1kg and its density is 2.7 × 103kg/m3

 **String**

 **Water**

 **Aluminium**

# Figure 10

Calculate the tension in the string. (3marks)

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1. Name any two forces acting on Aluminium block (2marks)

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1. State and explain the change that would be made on tension when water is replaced with mercury

 (2marks)

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