SANJOAC

END OF YEAR ASSESSMENT SET TWO

S.2 PHYSICS

Paper one

2 hours

NAME: …… STREAM: ……..

Instructions

- *Answer **all** questions in section A and **any two** from section B*
- *All answers in section A **must** be written in the spaces provided*

SECTION A (40 marks)

1. During construction, a material of **relative density 7.8** was identified to be used.
   a) As a S.2 learner, what do you understand by the term relative density of a substance? ***(01 score)***

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   b) Apart from identifying materials for construction, where do we apply the knowledge of relative density in our day to day life. Give two ***(02 scores)***

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   c) Using water as a reference material, determine the density of the material in the question (Density of water $= 1000kg^{-3}$) ***(02 scores)***

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2. A single force which produces the same effect on the body as a number of forces acting on the same body is known as …….. And cohesive and adhesive forces are inter – molecular forces which hold molecules of the …….. and ……..respectively together. An insecticide placed in one corner of the house kills a mosquito resting on the sealing due to ……..and putting a hard polythene in the under in the foundation of a building stops …….. ***(05 scores)***

3. Nelson wants to construct a liquid – in – glass thermometer. He is currently in a place whose temperature range is $-90^0C\ to\ 70^0C$.

   a) With a reason which liquid should Nelson use during the process ***(02 scores)***

   Liquid: ……

   Reason: ……

   b) Suppose he is done with the construction process and he does not know how to calibrate it. Make a simple write up he can follow to calibrate it without any external help. ***(03 marks)***

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4. Two men James and Peter were tasked to transfer bags of cement. Peter lifted 2 bags each weighing 50 kg and carried them through a distance of 4 metres. James carried one bag from the ground floor to the first floor using 150 stairs of height 0.02 metres **each.**

   a) By calculation, of the two men who did more work ***(03 scores)***

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   b) If peter did his work in 3 minutes, and James in 1 minute. Who did work with more power. Show working. ***(02 scores)***

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   c) Advise peter and James separately on how they can simply their work. Use the knowledge of machines. Clearly tell them the best machine each can use to have their work done using the least possible energy. ***(03 scores)***

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d) Help them know how they can separately improve on the efficiency of the machines chosen in order to further use less effort. ***(02scores)***

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5. a) Musa bought a package of weight 350N in a box whose dimensions are $5m \times 1m \times 3m$. Calculate the minimum and maximum pressure the box can exert on its support. ***(03 scores)***

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b) A woman putting on high – heeled shoes damage a cemented floor compared to one putting on flat shoes. Explain the real-life observation. ***(02 scores)***

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6. a) A hydraulic car brake works on the principle of transmission of pressure in liquids known as …… which states that pressure applied at one point of an enclosed fluid is ……transmitted through out the whole fluid and in all…….. ***(03 scores)***

b) A hydraulic press machines also applies the same principle above. At a certain garage it is used to lift a car of weight W, resting on a piston of cross – sectional area $100cm^2$ by using an effort of 20N at a piston of cross – sectional area of $2cm^2$. Calculate the weight W of the car. ***(02 scores)***

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7. Atmospheric pressure is the pressure exerted by the weight of air on all objects on the earth's surface. It is measured using a **Barometer.**

Give and explain one real life situation that really demonstrates/shows that atmospheric pressure does exists. ***(05 scores)***

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SECTION B (20 marks)

*Attempt strictly **two** questions in this section.*

8. Muggaga a cattle keeper was rearing his cows in Nagadyonga forest and he come across a piece of a glittering solid. He tried to analyze the shape of the solid and he failed to come up with a clear shape. He picked it and took it home. On reaching there he placed it at the dining table but her wife was not home. His wife was so happy on her return seeing a glittering material and she called her friends to come and see the material. One of the friends said that it is pure gold and told them that they can earn 7 millions from their piece of gold. Muggaga and her wife are very happy.

Support materials:

- Measuring cylinder
- Beam balance
- Piece of thread.
- Water

Material	Density (gcm^{-3})	Density (kgm^{-3})
Glass	2.5	2500
Copper	8.9	8900
Gold	19.3	19300

Task:

Help Muggaga's family to prove whether the material they have is pure by writing a set of procedures they can follow on their own to test its purity.

9. Moses wants to construct a factory at a certain hill in his village. He wishes to use water as the major coolant in the machines he wishes to use. His friend Musa notifies him that he should be careful with the height to which his factory is to be established. Musa convinces him that he should account for the altitude because as you go higher and higher the atmospheric pressure decreases. Atmospheric pressure determines the boiling point of a liquid. Musa warns Moses that he needs to first measure the height of the hill and know the pressure at the top of the hill.

Support materials

- A tube of about 1 metre
- Mercury in a beaker
- Metre rule

Task

Help Moses measure the height of the mountain by using the knowledge of atmospheric pressure and also help him know further the challenge he will face in case he has no other option of location.

10.

New vision

Sad new ***Sad news*** ***Sad news***

Today in the morning at St. Maphia primary school, 2 pupils were found dead in a down tank which is **10 metres** long below the ground. The head teacher was arrested immediately and the vision group interacted with him and says that the pupils were fetching water from the tank using a rope tied on the jerrycan which had a capacity of containing water up to the weight of 10kg.

The government is taking a step of closing the school tomorrow and to arrest all the teachers.

Support materials

A rope

The same jerrycan

A metallic bar OR a long moderate piece of wood

Wheel of the bicycle.

Task

Help the school come up with a simple machine they can use at the moment to help the school from being closed. Guide the pupils on how to use the machine using the least possible energy.

Use the knowledge and application of atmospheric pressure, write a simple report, include a machine you would recommend the government to install at the school to solve the problem completely.

END