NAME: …….. ……STREAM: ……...

STANDARD HIGH SCHOOL ZZANA

STAHIZA

COMPETENCE BASED CURRICULUM

END OF TERM ONE ASSESSMENT 2024

SENIOR TWO

PHYSICS

TIME: 2 HOURS

INSTRUCTIONS TO LEARNERS;

*Answer **ALL** items.*

Write in dark blue or black pen.

Assume where necessary;

- *Acceleration due to gravity* $g = 10ms^{-2}$
- *Density of water* $\rho_w = 1000kgm^{-3}$

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QTN NO.	SCORES	EXAMINER'S INITIAL
Out of 50		
Out of 100		

ITEM 1 (10 SCORES)

Rita, has just completed her primary seven at heavens primary school and admitted to standard high school Zana. On reaching the school, she was told by her friends that she needs to take 10 books to class each day for the lesson.

She was given 20 black books from the bursar's office, each of dimensions 30cm by 21cm by 2cm.

And was given a bag that has a volume 10080 cm^3. She is really wondering of how she will be carrying the books to class in the bag every morning.

Task

a) If Rita can only take the books that can fit in the bag, help her determine how many books she can carry at a time.

b) b) if she sits on a single sitter of the upper deck of dimensions 105cm by 18cm. **how many books can she put on the upper deck at a time.**

c)If Rita reported late and she found that the teacher had already taught **about fundamental and derived quantities,** how best can you help her differentiate between the two giving two examples in each case.

ITEM 2 (10 SCORES)

(a) Juliet and Rahmah failed to agree in a discussion that was organized towards the end of term one last year. The discussion was whether energy exist in forms or not. Juliet said there can't be forms of energy whereas Rahmah said they exist about seven of them.

As a S.2 student, write a report guiding them clearly about their argument and include the applications of content in daily life.

During holiday of Term 3, the father asked his son to go and join a certain construction site. As he was at work, an engineer lifted a heavy stone of 2,200kg from a deep hole through a vertical height of 7m from the bottom of the hole using crane within 2 minutes. As a physicist, help him to get how much work was done by the crane and its power. (Use g = $10ms^{-1}$).

ITEM 3 (10 SCORES)

JOAN bought two oranges and two eggs from a market as they went to the trip after which they went for a boat ride on Lake Victoria.

She had feared to sit in the boat because it was made of metals of which she knew that it was denser than water. However looking the other side of the lake, she discovered that it was possible for the boat to float on water even though it is metallic.

While on the boat, she peeled one of the oranges and accidentally the peeled and the unpeeled oranges fell in water, she was again amazed by the fact that the peeled one sunk and the unpeeled one floated and was able to get it back.

Support

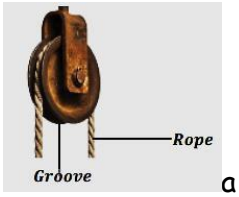
Task

As a physics student, help Joan understand why the boat was able to float on water.

b) using the physics learnt in measurements, explain why thar unpeeled orange floated and the peeled one sunk and state any other real-life application of the above scenario.

Item 4 **(10 SCORES)**

In day to day lives in our homes. So many things are done including farming, construction, fetching water and so many things, the residents of the village have been told by the government that there are some machines that can be used to simplify the work that they do and the following machines are available in stock.



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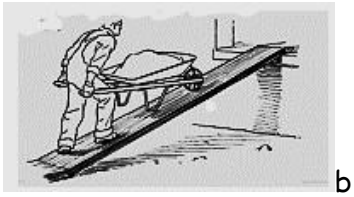

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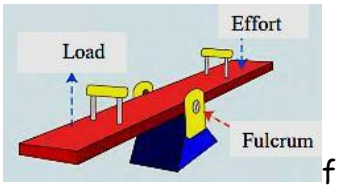

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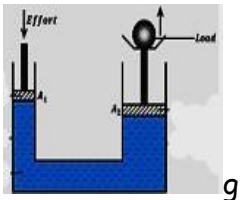

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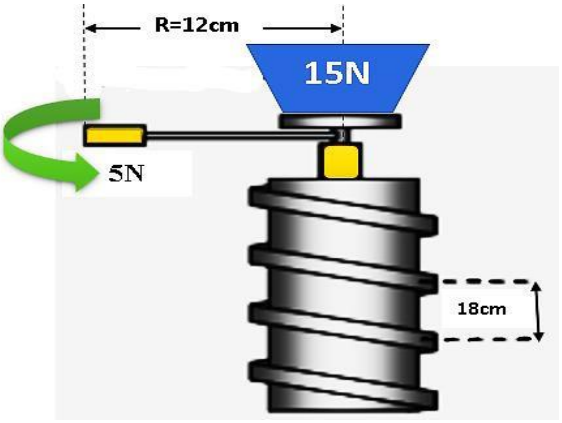
TASK

a) As a physics student, you have been asked to brief the community about the above machines, by clarifying their names, uses and where they can be applied in real life

b) If one of the community members uses the machine bellow to tighten his nuts with,

The handle of a screw jack is **12cm** long. The screw jack is used to drive a screw of pitch **18cm**. if an effort of **5N** is applied on the jack to move a screw of **15N**, Calculate the Velocity ratio.



Item 5 **(10 SCORES)**

Zacharias is puzzled because his metallic doors are always very hard to close during day time when it is shining too much, and he says that the same doors are very easy to close in the evenings when the temperatures have lowered by considerable amounts. As a Physicist who understands better, the effect of temperature change on matter:

Task

(i) Explain the cause of Zacharias' puzzle

(ii) Describe any applications of the cause stated in a(i) above in our daily life.

(b). Basing on the kinetic theory, explain why liquids expand much more than solids for the same temperature change?

(c). Explain the Biological importance of the anomalous expansion of water in preserving aquatic life in countries like Switzerland where temperatures go below 0^{o} C, relating to the diagram shown below.