END OF TERM TWO 2024
COMPETENCE BASED CURRICULUM
S1 PHYSICS

TIME: 1 HOUR: 45 MINUTES

NAME……

Instructions: Attempt all Items

ITEM ONE

Assimwe, a mother, has a baby who has been feeling warm to the touch. Ayebare, the baby's concerned older sister, notices this and wants to help her mother check the baby's temperature. She remembers a traditional method of measuring temperature using a homemade device. Ayebare approaches her friend, Kutaisi, who has a good understanding of physics, to help her create a tool to measure her baby sibling's temperature.

Kutaisi suggests using a glass tube, alcohol, and water to create a device that can measure temperature. After constructing the device, they calibrate it by marking the length of the alcohol column at the steam point (100°C) as 80cm and at the ice point (0°C) as 30cm.

Task: As a physics learner,

(a) How can Kutaisi and Ayebare use everyday materials to create a reliable temperature-measuring device? What steps can they take to ensure it gives consistent results?

(b) If the length of the alcohol column in the device is 48.5cm when placed near the baby, what can be inferred about the baby's temperature? Show your calculations and explain your reasoning.

(c) Based on the temperature reading, do you think the baby is sick or not? Explain your answer.

ITEM TWO

Nakayiza got a glittering stone from a quarry and she was very happy. She told her mother and father that they had become rich, it's a gold stone. The mother believed in her girl but the father never accepted.

Nakayiza's father approached you for further investigations on the stone. According to your observations, the mass of the stone is 96.5g and when you immersed it in a measuring cylinder containing $50cm^3$ of water, the water level rises to $55cm^3$.

Hint: Density of pure gold is $19.3gcm^{-3}$

Task

As a physics learner,

(a) State all the apparatus used in that experiment.

(b) What steps would you follow in your investigation?

(c) Is the stone gold? Explain your reasoning.

(d) What dangers are you likely to face while carrying out that experiment, and how can you prevent them.

ITEM THREE

Ssekyewa and his friend Nampiina visit an elderly man in their rural community who lives in a small hut without electricity. They find him sitting in total darkness, struggling to repair a broken tool. The old man explains that he needs light to work, but his family cannot afford electricity. Ssekyewa and Nampiina decide to help the old man by creating a lighting solution using locally available materials. They collect a glass bottle, some metal wire, a piece of cloth, and a small container. As they work on the lamp, they notice that the wind is blowing strongly, and they need to secure the lamp to prevent it from falling.

The forces acting on the lamp are:

- The weight of the lamp itself, pulling it downwards with a force of 5 N

- The tension in the wire, pulling it upwards with a force of 3 N

Task:

As a physics learner,

(a) How can Ssekyewa and Nampiina use the materials they have to create a system that can provide light for the old man?

(b) What happens when the force of the wind, the weight of the lamp, and the tension in the wire all act on the lamp at the same time? How can Ssekyewa and Nampiina calculate the overall force acting on the lamp?