END OF TERM 2 EXAMINATIONS 2024
S.3 PHYSICS
TIME: 2 HOUR: 15 MINUTES

NAME…………………………………………………………………………………………SIGN…………………..

Instructions:

> ➢ *Attempt all the four Items using the answer sheets provided*
> ➢ *Smartness and clear diagrams earn you more marks.*
> ➢ *Use a Graph paper where possible.*

ITEM ONE

Two friends were invited to attend a meeting which was to be conducted during the day and at night was a party. As they were travelling on a tarmac road in min-bus they observed a pool of water ahead but on reaching at that point the pool of water was not there and thought it was magic. The meeting was conducted on a projector and one of them had put on a red T-shirt with blue spots while the other was in a yellow T- shirt with green strips.

In the room there was two bulbs A, which gives off white light and B, which gives off a green light. When the meeting ended, late evening the party started with bulb A on and B off. Later the music started with bulb A switched off and B turned on and their T-shirts changed colours.

Task: **As a Physics student;**

(a) Explain the pool of water observed by the two friends on their way.

(b) What colour(s) did the T-shirts turn to when bulb B was switched on? Explain your answer.

ITEM TWO

A certain company is packing sugar in packets for sale; equal to m kg each packet, which is to be transported to the wholesalers using a bus. At the transportation point, Peter observed that the bus was being loaded in the boot and not at the roof rack. John a wholesaler man has received complaints from the customers that he is selling to them sugar that is not equal to the branded amount which has caused him to lose more customers every day. John in his shop has a mass of 2kg, a knife edge, a strong metre rule of mass 0.3kg, and a strong thread.

Task; **As a physics learner**

(a) Help John and prepare for him a message on how he can use the available materials in his shop to verify the amount of packed sugar which the company sells to him.

(b) Given that john pivoted a metre rule at 60cm which balanced horizontally when a 2kg mass is at 30cm and a packet of sugar at 90cm mark. The branded (marked) value of sugar is 4kg. Verify if the customers' complaint was true or false. What should John do with the sugar and advise him accordingly.

(c) Explain Peter's observation.

ITEM THREE

A newly recruited dentist was supposed to examine the tooth of the patient. The dentist wants to use a curved mirror of focal length 10cm but he is not so sure of the position of the patient's from the mirror. The possible positions of the tooth from the mirror are A, B, C, D, E and F.

Table 1

Position	**A**	**B**	**C**	**D**	**E**	**F**
Distance from the mirror	**0**	**5**	**10**	**15**	**20**	**25**

Table 1 shows the distances from the mirror in cm

Task; As a physics learner,

(a) Which type of the curved mirror is the dentist supposed to use?

(b) As a physics learner, explain how you would help the dentist to select the best position of the patient's tooth and give a reason why you have not selected the other positions.

(c) Draw a ray diagram to illustrate the image of the tooth in the mirror when the tooth is at a position you have selected in (b) above and give at least two features of image formed

ITEM FOUR

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.

END