**BEGINNING OF TERM I EXAMS 2024**

**S.3 PHYSICS P535/1**

**TIME: 2 HOURS**

**INSTRUCTIONS:**

* **Attempt all questions**
* **Assume acceleration due to gravity**
* **G= 1-m52 where necessary**

1. **Scenario**

A real estates businessman builds apartments for rent. He is fed up with the increasing costs of water from National water and sewage co-operation (NWSC). He decides to dig a well in the compound and pumps the water directly from the well. He has contacted a company called “POINT WATER’S LIMITED” for the project.

After pump testing, the company comes up with the report having the following details.

* The apartments need 4000 litres of water per day
* The well to be drilled is 50m deep
* A water pump with a motor should be purchased to pump the water
* Four (4) solar panels of capacity 2585W are to be purchased
* Two (20 tanks each 2000l are to be installed on a tank stand 2.5m high
* Underground pipes are to be bought to supply the water to different points.

The company’s quotation (BOG) for the project is 20 millions. However the business man is complaining of the huge amount of money. He suggests that the water tanks be put on a slab already built on the ground rather than the stands. The company is refusing this idea.

**TASK**

1. Suppose you are the engineer of the company, write a report to the businessman explaining,
2. What would happen if the tanks are put on the slab and why they should be put on the stands? (04 marks)
3. The properties of materials of the tank stand and underground pipes. (04 marks)
4. Why the company prefers use of solar energy. (04 marks)
5. Given that the density of water is 1.0gcm-3,
6. Determine the, mass of the water in the two tanks.
7. Potential energy of the water in the tanks. (03 marks)
8. Explain any three (3) reasons for the rising bills of water and electricity in Uganda today and suggest solution to them. (06 marks)

1. **SCENARIO**

Residents of Kiryagonja community rely on selling agricultural produce such as beans, ground nuts, maize amongst themselves for their domestic needs. The community has a challenge of measuring the exact amounts of the produce to be sold to each other due to lack of access to a weighing scale. The community does a lot of estimation in measuring the produce for scale and as a result, a lot of losses are made. The community is blessed with a 10kg mass bought to them by their member of parliament.

**TASK**

1. Using the available local materials, discuss how you would help such a community to measure their produce using the 10kg mass. (10 marks)
2. Suggest ways that they should undertake to increase their produce in a season. (10 marks)

**END**