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Apex Examination Council

APEX EXAMINATION COUNCIL

END OF TERM 1 EXAMS 2025

S.3 PHYSICS ONE

TIME: 2 HOURS

INSTRUCTIONS

- This paper has five items
- Attempt 4 questions in all

ITEM 1

Namubiru is a woman who lived with her 4- year – old boy in Kyampisi village. One day his son mixed iron fillings with maize flour. When her mother had prepared water for mingling she found the flour with iron fillings. She had an iron bar and she wondered how she can do to get out of this situation. Her young sister Shalidah had inquired her about how the magnets are formed from iron bars. This made her to regain confidence when the magnet was made the iron bars were concentrating on the poles of the magnet. They made her to wonder why it looks like that. (14)

Task:

Namubiru has approached you to help her understand:

- What processes are done on the iron bar to become a magnet?
- Types of magnetic materials.
- Why the iron fillings were concentrating at the poles?
- State the domains theory of magnetism.
- Properties of magnets.

ITEM 2

S.3 and S.4 students of a certain school were to have a motion (debate) about time durations of a day, night and seasons of a year which they normally experience in their lives. This motion was to be preserved on visitation day to parents most of whom are peasants.

In their debates, one presenter argued that ocean tides are the cause of these motions. Another learner supplemented that ocean tides and drought are caused by artificial satellites placed in space by powerful countries like Russia.

A parent who had attended also said that seasons are brought about by the motion of the planets about the sun and this distorts climatic conditions.

The audience was confused by the arguments. A learner from the audience raised an inquiry if there can be means of getting some information about these weather changes and planets.

The chairperson tasked each participant to make more research so that they could have clear information for the next presentation.

Task:

As a learner of physics, help the audience to;

- a) Understand about time duration of the day, night and year
- b) Explain the occurrence of seasons and ocean tides
- c) Know what artificial satellites are and their roles they play in everyday life.

ITEM THREE

One day the daughter to a minister asked the following items from the dad to improve out some physics explanations. He was given by the teacher

- i) Mercury
- ii) Water
- iii) Capillary tube
- iv) 2 beakers

He wanted to know about the levels of mercury in a big capillary tube and small one just like it is in water.

Task

- i) What forces are responsible for the change above.
- ii) With the aid of a diagrammatic illustration, explain what happens to the above mentioned levels when temperature is increased.

ITEM FOUR

Long time ago eclipses were considered as a message from the gods since the people in that age dwelt so much in the spiritual realm than the scientific word. But with the development of science and technology, eclipses can now easily be explained scientifically instead of spiritually. Whenever eclipses occur many people gather out in open places to watch the beautiful view of the heavenly bodies as they align themselves in a beautiful display. However, in most remote areas of Uganda some people still observe the eclipse directly using naked eyes not aware of the risk they are exposing their eyes to in the long run.

Task:

As a learner of physics,

- a) Explain the difference between total and partial eclipse
- b) Using illustrations, explain the differences between solar eclipse.
- c) In a certain experiment to investigate nature of light, the set up below was arranged;
 - i) State the property of light being investigated and explain its implications in daily life
 - ii) Explain what would happen when one of the cardboards is displaced slightly.

ITEM FIVE

A local government decided to contract a company to construct a road through a newly acquired land. During the excavation, a tractor removed a hard bone, that appeared to be an animal, but everyone wondered for how long it had stayed in the soil. The bone was then taken to a laboratory for close analysis. Another section of the road had unusual soil particles. Some of these samples were picked and wrapped in a piece of paper and then placed in an aluminium container and then kept in a thin wall lead box. After 20 days, it was discovered that its mass had reduced by $\frac{3}{4}$ of its original mass and all fluorescent materials kept in the same state were found glowing. This worried every one.

Hint:

The mass of carbon- 14 in the bone is 5g.

Mass of carbon-14 in the bone of living animal =20g.

Task:

As a physics learner

- a) Explain to the people to understand the age of the bone
- b) Explain to the people what these particles are likely to be
- c) With reasons advise the people in this area.