MAKERERE COLLEGE SCHOOL
END OF TERM 1 ASSESSMENTS 2025
S.3 PHYSICS
Paper 1
Theory
2 hours

INSTRUCTIONS TO LEARNERS:

*Attempt any **four(4)** items in all*
All items carry equal scores
Any additional item(s) answered will not be scored.
Start each item on a fresh page
Responses **must***be written in the booklets provided* .

Item 1.

A man who stays in an area with a view of ocean requested his mother to pay him a visit in Canada. On her arrival at her son's home, it was noon but her watch set to Ugandan time read 8:00pm. On looking through the window, she also noticed very high waves in the ocean which was different from photos that were always sent to her. The mother called you to confirm if it was indeed night in Uganda while it was day time in Canada.

Task:

As a learner of physics, explain to the mother,

(a) Why it was night in Uganda and daytime in Canada?

(b) the cause of high waves in the sea

(c) the occurrence of seasons

Item 2.

A man set off for a destination 250km away from his home at 4:00am using his car to be at his workplace at 8:00am. The speed limit on that road is 80kmh^{-1}. He set off on his journey without fastening his seatbelt and drove at an average speed of 60kmh^{-1} for the first 2 hours. He saw a truck that had fallen covering the whole road and stepped on his brakes which brought the car to a sudden stop. This made him jerk forward almost crushing into his windscreen. The man stopped for 45 minutes and resumed his journey, reaching his workplace on time. He got out of his car and discovered it was very cold so he decided to wear a black sweater which was against the choice of his workmates who said he looked smart in white shirt.

Task:

As a learner of physics:

(a) Help him to determine whether he exceeded the recommended speed limit.

(b) Help him understand what made him jerk forward.

(c) Explain to the man's workmates why he chose a black sweater.

Item 3.

During a dry season, a school resorted to drawing water from an underground well 8m deep. Originally, they did it manually by lifting a metallic bucket of mass 4kg and volume 20 litres. The school workers however complained that the bucket was very cold in the morning, very hot in the afternoon when the sun was up. It was also very tiresome to keep pulling up the bucket manually. They suggested a pulley system of 4 wheels and an efficiency of 80% be used to quicken the work.

Hint: 1 litre of water= 1Kg

Task:

As a learner of physics:

(a) Help them to explain the changes in temperature of the bucket.

(b) Help them determine if a force of 500N will produce the required efficiency of the machine?

(c) Help them know how they can improve the effectiveness of the above machine?

Item4.

During holidays, a boy of mass 50kg went to a play resort near the lake shores on a certain beach and sat on one side of a see-saw at a distance of 2.4m from the pivot. It was very hot that day, afterwards he decided to enter the lake and swim to cool himself. He was wearing heavy black shorts and white vest. After swimming, he was left puzzled and wondering why his heavy black shorts dried quicker than the white vest and beach cottages (semi-houses) roofed with grass instead of iron sheets were cooler than those with iron sheets.

Task:

As a learner of physics:

a) Help the guide at the play resort to determine if another boy of mass 40kg will restore equilibrium in the see-saw if he sits at a distance of 3m from the pivot.

b) Assist the boy to understand what has made him puzzled and keep wondering.

Item5.

Pius is a very inquisitive boy. He is a primary six pupil at Phimose primary school. One morning he woke up for school and after combing his hair, he placed the comb on the table where his little sister had been playing with some tiny pieces of paper. He noticed that the comb attracted the pieces of paper and this left him wondering. On his way to school, he saw a truck carrying petrol in a metallic tank having a metallic chain hanging at the bottom and being dragged along the ground as the truck moved, he again wondered about the purpose of this chain. He checked on his watch and realized he was left with 45minutes to be late for school yet he had left with 10km to reach school. He boarded a bodaboda which accelerated uniformly from rest to $30kmh^{-1}$ in 5minutes then moved with this velocity for some time after which he decelerated uniformly until he reached school in 5minutes.

Task:

As a learner of physics:

a) Help Pius understand;

i) Why Pieces of paper got attracted

ii) The purpose for the metallic chain

b) Determine whether Pius reached school on time

Item 6

Joan and Jane were going for an overnight on a Friday. On their journey, they found a nasty accident involving two vehicles which had involved in a head on collision. They stopped for a few minutes to find out what had happened and immediately a police patrol car came in and they started doing their investigations. On arrival of the police patrol car, the people were amazed by how the color of their clothes kept on changing due to the changing lights on the patrol car. When they reached church, Joan was uncomfortable during praise and worship session yet Jane was enjoying the session. It was later found out that Joan had high heeled shoes while Jane had flat shoes.

Hint

i The bigger car was moving at speed of $30ms^{-1}$.

ii The smaller car was moving at a speed of $25ms^{-1}$

iii The bigger car and smaller car had masses of 8000kg and 10000kg respectively.

iv They were moving in opposite direction at the time of collision.

v The driver of the smaller car was forced out of his car through the wind screen

since he had no seat belt on.

vi The two vehicles got stuck together after collision.

vii The patrol car had two lights that's blue and red

viii Joan's dress was white with blue flowers.

ix Jane's dress was green with red dots.

Task:

As a learner of physics:

a) Help the investigations team answer the following questions.

i)The speed of the two vehicles after collision.

ii)The loss in the kinetic energy of the cars.

Iii) Why the driver of the small car was found outside his car after collision.

b) Help Joan and Jane

i) Clarify on the appearance of Joan's and Jane's dress in the different lights from the police car.

ii) Understand why Joan was more uncomfortable than Jane during praise and worship session.

BEST WISHES