

DEPARTMENT OF PHYSICS

S.3 PHYSICS END OF YEAR

DURATION: 2HRS

SECTION A

INSTRCTIONS: Attempt all questions in section A and any one in section B.

Answers to section a should be written in the spaces provided and answers to section B should be written on the answer

1. Fishermen in katosi are complaining about poorly designed boats by carpenters who have no knowledge of density in relation to sinking which has led to rampant water accidents and loss of lives. When carpenters were tasked to give a report on the kind of boats they make. They claimed they have been designing boats of total mass (including passengers and their goods). 6500kg with total volume 5m³.

Support material.



Task.

Using scientific evidence explain to carpenters why their boats normally capsize and how they can prevent it. (Hint: The density of water is 1,000kgm⁻³) (6marks)

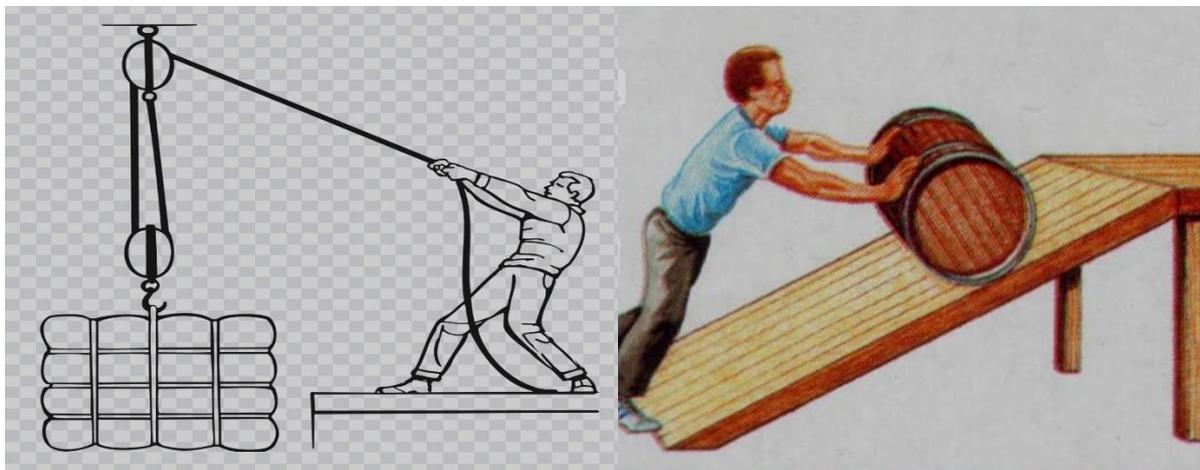
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2. In the science laboratories of KSS, the water from the taps is of low pressure, as a way of solving this problem, a concrete raised platform of 12m was to be constructed. The pressure that is sufficient for the labs should be beyond 100000Pa.

An engineer and his support worker had a disagreement on the best type of simple machine to use when raising the tank of weight 600N to the top of the raised platform. They had the following simple machines.

- (a) A block and tackle pulley system, the effort moved through a distance of 36m using an effort of 250N.
- (b) A smooth inclined plane of length 24m using an effort of 400N.

Support material.



Task.

- (a) Help settle the dispute between the engineer and his support worker by choosing for them the best type of simple machine with scientific evidence (efficiency). (8marks)

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(b) Also show them that the new height to which the tank is placed can help solve the problem of low pressure. (density of water is 1000Kgm^{-3}) (4marks)

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3. A man from Wakiso district used to shave his beards every after a week after sometime he noticed that his beards required to shaver every after two days which was expensive for him so he opted to buy his own shaver machine , brush, shampoo and a mirror. On reaching home he realized that the mirror he had bought gives different Nature of images at different object position and kept wondering which type of mirror he bought. When he contacted the seller , he told him to place it in the right place in order for it to serve a purpose and yet he lacked the skills to determine the position.

Support material



Task.

(a)With aid of a diagram help the man identify the best shaving position (3marks)

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(b) Give reasons to support your answer.

(3marks)

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(c) Give applications of convex mirrors

(3marks)

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4. In Kibuli Secondary School, S.1 students organized an end of year party which was to take place in the MPS. The organizing committee of the party hired a Senior six fine art student to decorate the MPS with balloons which he bought from town. The decorator hang some of the balloons inside the MPS in the hot sun. shortly before the celebrations could begin, all the balloons hanging outside the Arena burst. Those inside did not. Some of the S.1 students accused the decorator for having bought balloons of poor quality and demanded for a refund of the money he was paid to do the job. The decorator maintained that the balloons were of good quality which is why those in the shade did not burst.

Support material



Task

Give an explanation that demonstrates scientific knowledge to convince the S.1 students that the balloons were not of poor quality. (3marks)

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In addition, give and explain three other real-life situations where the same knowledge can be applied (6marks)

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SECTION B

QUESTION 5

Scenario

A truck driver is contracted to deliver the construction materials to a construction site which is 2.5km from the source. 200 UGX was to be paid for every metre covered. At 1:30pm when it was hot, he drove steadily from rest up to the speed of 40ms^{-1} in 10s and this speed was maintained for 30s. Along the way he realized that the truck had developed a flat tyre and then slowly decelerates to rest in 5s before reaching the site. On contacting the owner of the materials, she arrived at the scene with another truck to help deliver the materials. The driver of the broken truck and the owner of materials have failed to agree on the amount to be paid.

Support material.



Task.

As a senior three student who studied motion, Help to settle the dispute between the two parties by establishing the mode of payment to the track owner . Also explain to the driver the likely causes of the flat tyre. (10marks)

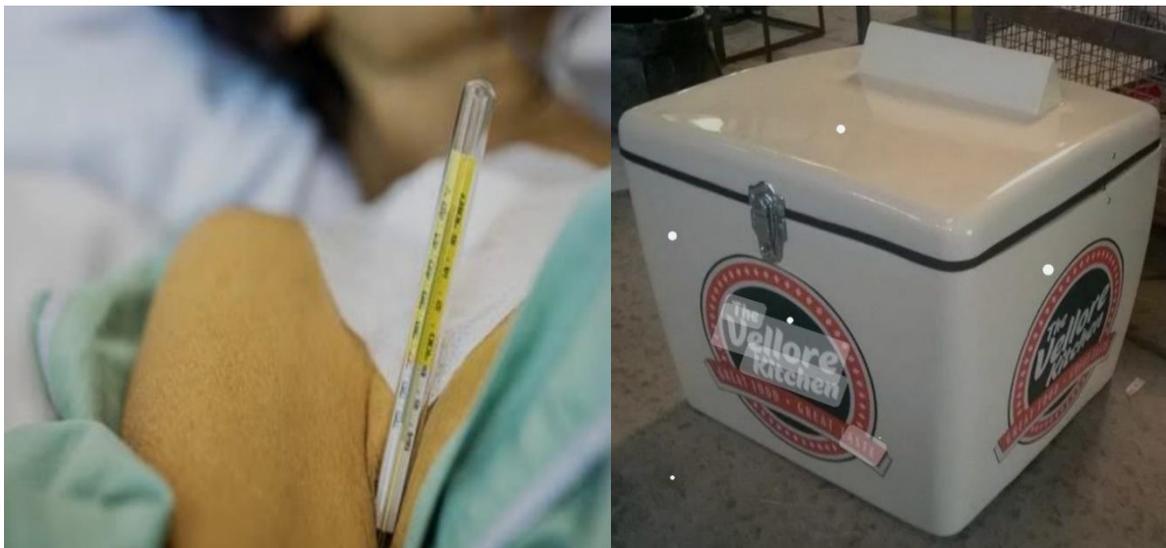
QUESTION 6

Scenario.

Your friends aunt got an accident and is admitted in some village hospital far away from their home. Your friend is required to deliver a hot meal to the sick aunt. She prepared the meal and packed in the metallic dish, put in her bag and hurried to the hospital.

Unfortunately, on reaching the hospital, the patient's temperatures had risen and nurses needed to know the level. The only available thermometer had a faded scale and nurses available were junior nurses on intern. They were planning to borrow a thermometer from a nearby hospital which was a bit far. On checking on the food, of the patient it had also cooled.

Support material.



Task

(a) Write an advisory note to the junior nurses on how best they could use the available thermometer to take the readings to avoid moving far distances in an attempt to borrow a thermometer & (6marks)

(b) also advise your friend on how best the meal could be kept warm for a long time without using a vacuum flask. (4marks)

GOOD LUCK