S.3 PHYSICS HOLIDAY WORK

Item one:

One afternoon as, senior one day scholars were going back home walking on a tarmac road on a very hot day, they saw a pool of water on the rod which moved away as they got closer to it. An ambulance car moved from the opposite side with a siren making 10 complete revolutions per second covering a distance of 3m between two successive rare factions as displayed by the monitor in the ambulance computer. The ambulance stopped and one of the healthy workers jumped out and warned the learners to stop walking unprotected in very sun shine. Learners were all surprised to see the ambulance van packing without hearing the siren.

Task: As a senior three physics learner help the learner to;

(a) Understand how the observation made on the road occurs.
(b) Find the speed at which the sound of the ambulance siren was moving.
(c) Understand why they were un able to hear the siren.
(d) Why the healthy worker warned them and how they can protect themselves from such effects.

Item 2

In Uganda, football lovers were watching a live match at 10:00pm between PSG and Chelsea F.C played from USA at 02:00pm. It was very hot in USA and players were often given cooling breaks yet in Uganda, football lovers were freezing with heavy jackets on. During the cooling break, the commentator made a statement that "the sun is the beginning and the end of life on the earth, without it life would not be possible." All the viewers were puzzled and perturbed.

Task: As a physics learner;

a) Help the viewer understand the cause in time differences in the two countries.
b) Help the viewers understand weather differences in both countries at the same time.
c) Help viewers understand the phrase made by the commentator.

SECTION B: PART 1

Item 3

Mary, a senior one girl felt headache and developed a high temperature. Her classmates suspected her to be sick and rushed her to the sick bay for first aid, however, the school nurse had moved out of the school and had left a thermometer with a lover fixed point of 2 cm and an upper fixed point 36.0cm on the table. One of the girls inserted the thermometer under her arm pits and gave a reading of 16.2cm. the school matron called Mary's mother who came immediately with boiled milk in a bottle. By the time the mother reached school, the milk had already cooled down. The matron advised her to use a special bottle that can keep the milk hot for a long time. Inside the sick bay, learners complained about the high temperature especially on hot days.

Hint: (Normal body temperature lies in the range $36.1°C\ to\ 37.2℃$

Task: you have been called by the matron to the sick bay. Help Mary's mother to understand.

(a) Whether Mary's temperature is normal.
(b) How the bottle advised by the matron works?
(c) What can be done for the learners' complaint about the sick bay.

Item 4

A driver in a brand-new car of mass 2500kg travelling from Kampala to Mukono under a little drizzle, saw a packed car of mass 2000kg a head of him on the road whose fuel had got done. The driver immediately applied brakes but all was in vain, an accident occurred and the vehicles collided, moved together with a common speed of $20ms^{-1}$. Fortunate enough no one sustained serious injuries. After some time, the police officer reached the accident scene and made his measurement. By looking at the car tyres, the police officer concluded that it was in a dangerous mechanical condition though it had been barely one-year-old on the road.

Task: As one of the witnesses of the accident, you have been selected to explain to your classmates;

a) Whether the car driver was driving at a normal speed.
b) Why the car failed to break.
c) How road accidents can be minimized on Ugandan roads.

SECTION B PART II

Item 5

During an electrostatic experiment in S.2 class room located on one of the tallest buildings in school, learners were instructed to cut small pieces of paper. They were asked to rub their plastic rulers against their hair, hold them above the piece of paper and make observations. A teacher bought a charged rod and asked them to test the nature of the charge on the rod. The learner were also warned about the hazardous effects one can encounter while carrying out electrostatic experiments from an unprotected building like that of S.2 block.

Task: You have been invited to S.2 class to explain;

a) How the observations learners made occur.
b) How the leaners can test the nature of the charge on the rod.
c) What modification can be done on the building for learners to be safe.

Item 6

While a local mechanic was fixing a damaged radio from his workshop, he watched a school of fish moving at a high speed without knocking each other on the national geographical T.V channel.

As he was still pondering about the observation, one of the screws fell down and the device he was using to locate them had been destroyed by his stubborn son. All he had been left with, were two undistinguished rods suspected to be either of iron or steel, an insulated wire, some iron fillings and a pair of fresh dry cells.

Task: Using the knowledge of physics, help the local mechanic:

a) Understand how what he watched on the T.V happens.
b) How he can use the available resources to make a device he can use to fins his screw.
c) Understand what can be done in order to distinguish between the two rods.

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