

NAME: _____ SIGN: _____.

S.5 TERM I BIOLOGY ASSESSMENT – 2025

CHEMICALS OF LIFE

1 HOUR 20 MINUTES

Instruction:

Attempt all the items in this paper.

ITEM 1.

During a recent study at Makerere University, researchers in dermatology have discovered that glycerol-based lipids containing **oleic** and **stearic** fatty acids are one of the most effective and healthiest organic skin moisturizers. The researchers also discovered that shea nut is an ideal source of those fatty acids.

The faculty of dermatology has therefore decided to establish facilities that can be used to isolate oleic and stearic fatty acids from shea nut seeds to be used in the manufacture of skin care products. Oleic and stearic fatty acids have the formulae **$C_{17}H_{33}COOH$** and **$C_{17}H_{35}COOH$** respectively, which when reacted with glycerol form **triolein** and **tristearin**.

TASK:

- a) i) As a S.5 learner who has knowledge about lipids, show how triolein and tristearin can be manufactured by the dermatologists to be used in making the skin care products.

Triolein.

(05 scores)

Tristearin.

(05 scores)

ii) With a reason, identify the type of reaction that leads to the formation of triolein and tristearin.

(02 scores)

b) Giving a reason in each case, suggest which of the two products is;

i. A liquid at room temperature. **(02 scores)**

ii. A solid at room temperature. **(02 scores)**

c) Describe the **physiological** functions of lipids in the body of an organism.

(04 scores)

ITEM 2.

In July 2024, according to reports by the World Health Organization (**WHO**), some African countries like DRC, Nigeria and Ethiopia registered cases of cholera. Cholera is a disease of the digestive system which primarily affects the small intestines and the colon. It is characterized by severe dehydration resulting from excessive loss of body fluids through vomiting and diarrhoea. The dehydration impairs many essential body processes which eventually lead to death of the victims.

Individuals who contract cholera usually develop symptoms like dizziness, headaches, extreme fever, dry mouth and throat, body weakness and low blood pressure. If left untreated, cholera victims with severe infections can die within 24 hours.

TASK:

- a) Explain the different body processes which are impaired by severe dehydration in cholera victims. **(05 scores)**

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b) Suggest the different ways how the spread of cholera can be controlled in a population.

(05 scores)

END