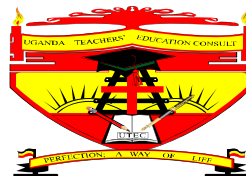


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FOODS AND NUTRITION

MARKING GUIDE



1. a) i. Define the term evaporation (2 marks)

Evaporation is a process by which a liquid becomes vapour.

ii. Explain the factors that affect the rate of evaporation. (7 marks)

- *Increasing the surface area of the liquid increases the rate of evaporation. This is because most molecules are exposed and are given a chance to escape.*
- *Increase in temperature increases the rate of evaporation. At high temperatures, kinetic energy of the molecules increases rapidly increasing the rate of collision, breaking inter molecular forces between molecules hence greater escaping tendency.*
- *Low humidity decreases the rate of evaporation, this is because water molecules in the atmosphere till the atmosphere occupying space for other molecules of water is not blown away they remain in air.*
- *Reduction in air pressure reduces the rate of evaporation because this decreases the possibility of vapour molecules rebounding off an air molecule.*

iii. What are the effects of condensation in a home? How does a home maker avoid condensation? (8 marks)

- *Condensation can cause growth of moulds and fungi because moisture is one of the necessities of growth of organisms.*
- *Condensation leads to rusting of metals and damage of equipment because moisture contains oxygen which reacts with most metals forming rust.*
- *It damages wall coverings and paint work leading to frequent decoration. It causes the walls to peel off and walls becoming weaker due to being prone to moisture.*

Condensation can be avoided by;

- *Improving the system of ventilation for example use of extractor fan in that extracts cold, moist air leaving dry cool air in the room*
- *Improving the way of insulation e.g. double glazed windows are less cold inside than outside.*
- *Avoiding cold glossy surfaces because they increase condensation*
- *Use of hygroscopic materials for turnishing to avoid moisture in the atmosphere*
- *Improve heating system so that walls are less cold. This heats up all the air around expelling moist air particles.*

- b) A boiler rated 3000W, 240V, takes 15 minutes to boil water. Calculate the average weekly cost of using a boiler, if it is used once every day and one unit costs 450 shillings. (4 marks)

$$\text{number of hours} \times \text{number of days} \times \frac{\text{wattage}}{1000} = \text{units}$$

$$\left(\frac{1}{4} \times 7 \times \frac{3000}{1000}\right) = 5.25 \text{ units}$$

$$\text{Cost} = 5.25 \times 450$$

$$= \text{shs. } 2362.5$$

- c) What are the advantages and disadvantages of an electrical immersion heater? (4 marks)

- It is quick, efficient and clean
- It can be used during emergencies
- It is thermostatically controlled
- Hot water is always available

Disadvantages

- It is expensive
- It does not work without electricity
- Acquires skills for its installation and use
- It is slow to heat up from cold

2. a) What is the importance of the following physical water treatment processes?

- i. Aeration (2marks)

To incorporate oxygen into the effluent that was lost during anerobic respiration in the sedimentation chamber.

- ii. Chlorination (02 marks)

To remove soaps, detergents and to kill microorganisms that are still in the water.

- b) i. Define sewage? (1mark)

These are solid, liquid and gas wastes that are unwanted in the environment

- ii. Explain the characteristics of settling lagoon (4marks)

It should be 1- 3 metres deep to collect enough sewage from different areas

- It should have retention time between 3 – 20 days to enable proper decomposition of the sewage.
- Lagoon system should be 3 – 10 lagoons so that there are aerobic, anerobic and maturation lagoons leading to complete sewage deposition.
- It should be in a tropical climate since it favours both aerobic and anerobic bacteria to decompose wastes.

- iii) Give the advantages of lagoons system in sewage management (3marks)

- Required degree of purification at lowest cost can be achieved.
- Lagoons are able to withstand both organic and hydraulic shock loads
- Operation and maintenance are simple and cheap

- Lagoons can be designed so that the degree of treatment is readily altered
- The land may be reclaimed for other purposes in the future
- Toxic compounds present in industrial wastes are removed by precipitation, absorption and sedimentation.

c) i. Explain the qualities of a drainage system (3marks)

- Qualities of a drainage system include;
- Not pass under the house to prevent bad smell incase of leakage
- Rest on concrete to avoid leakages
- Be well ventilated to let out toxic fumes
- Be laid in straight lines, where possible

ii. Describe four (4) methods of getting rid of solid wastes from our households. (4marks)

3. a) i) Make a clear sketch of a 30 A three flat pin fused plug with a cover removed and the fuse in position.
Explain the wire colour cording of the three cables in the plug
- ii) What is the purpose of a fuse in this case?
- iii) What are the advantages of a three pin plug over the a two pig plug
- b) i) A percolator is marked “2.5Kw 240V” and when filled with cold water, takes 5 minutes to boil. Calculate the cost (after the additional charges) of using the percolator for a month if it’s filled 3 times in a day.
(1 unit of electricity costs 940/-, VAT 31% and service fee of 3%)
- ii) Describe the working mechanism of a circuit breaker and outline its advantages over a fuse.
- c) i. Why have fluorescent lamps become very commonly used today?
- ii. Explain how one can avoid the glare caused by the lamps in 3 b (ii) above

4. a) i. What do you understand by the word stratification? (2 marks)

ii. State the principle of operation and Illustrate how the above is achieved in the domestic hot water system. (8marks)

b) Explain the construction and importance of double glazing to the house and its occupants. (4 marks)

c) i. With illustration, show how insulation is achieved in an oven. (6marks)

ii. Explain the structural and operational differences between a Grill and an oven (5marks)

5. a) i. Describe the structure and working principle of a steam cooker (10marks)

- ii. *What are the merits and demerits of using this type of cooking?* (6marks)
- b) *Distinguish between the compressor and absorption types of refrigerators* (5marks)
- c) *Discuss the advice you could give to your parents who are living a remote area on the maintenance of the a compressor type of fridge* (4marks)
6. a) *Electric costs have become high in Uganda.*
- i. *What are the reasons for the above statement?* (5marks)
- ii. *Discuss how you can help someone on how to save on electric costs.* (6marks)
- b) i. *What do understand by the term carbonization as related to home fuel making?* (2marks)
- ii. *Clearly explain any three principals involved in carbonization* (6marks)
- iii. *Explain the reason why the major product of carbonization is becoming expensive after each day* (6marks)

END