

SECTION A (30 marks)

1. B. Sand
2. B. records.
3. C. composting.
4. C. East Coast Fever
5. B. value addition.
6. C. Altitude
7. C. thinning.
8. B. Deep litter system
9. C. Slasher
10. C. brokerage.
11. B. agribusiness economics.
12. B. Gabions
13. D. integrated pest management.
14. B. Phosphorus
15. B. preventing dehydration and the spread of waterborne diseases.
16. C. Kraal
17. C. sustainable agriculture.
18. D. Grafting
19. C. Leghorn
20. C. health management.
21. D. Steaming
22. C. Vitamin A
23. D. Freezing
24. B. Carbohydrates
25. B. ironing.
26. C. Bobbin
27. B. Broom and dustpan
28. C. Stitches that are close together and blend in with the fabric.
29. C. sugar and simple carbohydrates.
30. A. Fresh vegetables

SECTION B (40 marks)

Task 1: Agriculture

31. Your class is learning about sustainable farming practices that protect the environment.

(a) Define what is meant by "sustainable agriculture". (1 mark)

Sustainable agriculture refers to farming practices that meet the needs of the present generation without compromising the ability of future generations to meet their own needs. It integrates environmental health, economic profitability, and social and economic equity.

(b) Give two specific practices that a farmer following organic farming principles would use. (2 marks)

- i. **Composting and green manuring:** Organic farmers heavily rely on natural sources of nutrients for their crops. They use compost (decomposed organic matter like plant residues and animal manure) and green manure (crops grown specifically to be incorporated into the soil) to enrich soil fertility and structure, rather than synthetic chemical fertilizers.
- ii. **Biological pest control:** Instead of using synthetic pesticides, organic farmers employ natural enemies of pests (like predatory insects or beneficial microorganisms) to control pest populations. They might also use practices such as crop rotation, companion planting, and encouraging biodiversity to naturally deter pests.

Farmers use different methods to get new plants growing. Some use seeds, while others use parts of the parent plant.

(a) Name two methods of propagating plants that involve using parts of the parent plant, such as stems, leaves, or roots. (2 marks)

- i. **Cuttings:** This method involves taking a section of a stem, root, or leaf from the parent plant and inducing it to form new roots and shoots. Examples include rose cuttings, cassava cuttings, or sweet potato vines.
- ii. **Grafting:** This is the process of joining a scion (a shoot or bud of a desired plant) onto a stock (the rootstock of another plant) so that they unite and grow as a single plant. It's commonly used for fruit trees like mangoes and citrus to combine desirable traits from two different plants.
- iii. **Layering:** In layering, a part of a stem is induced to form roots while still attached to the parent plant. Once rooted, it is detached and grown as a new independent plant. Examples include air layering for litchi or tip layering for raspberries.
- iv. **Budding:** This is a specific type of grafting where a single bud from the desired plant (scion) is inserted into the bark or stem of another plant (stock). It's widely used for propagating roses, citrus, and many fruit trees.

(b) What is one significant advantage of using vegetative propagation methods compared to planting seeds for certain crops? (1 mark)

Vegetative propagation ensures genetic uniformity/preserves desired traits: Unlike seeds, which can lead to genetic variation in offspring due to sexual reproduction, vegetative propagation produces new plants that are genetically identical to the parent plant. This is crucial for maintaining desirable characteristics such as high yields, disease resistance, specific fruit quality, or ornamental features.

Your school agriculture club is thinking about starting a poultry project.

(a) Name two common breeds of chickens that are primarily raised for their meat. (2 marks)

- i. **Broiler (e.g., Cobb, Ross):** These are fast-growing chicken breeds specifically developed for meat production. They reach market weight quickly and efficiently convert feed into muscle.
- ii. **Kienyeji Improved (e.g., Kenbro, Kuroiler, Rainbow Rooster):** While often dual-purpose, these improved kienyeji breeds are increasingly raised for their meat due to their faster growth rate compared to traditional kienyeji chickens and their hardiness.

(b) State one reason why ensuring there is enough fresh air circulating (proper ventilation) is very important in a chicken house. (1 mark)

Proper ventilation in a chicken house is crucial to **remove harmful gases like ammonia, carbon dioxide, and excess moisture**, which can accumulate and lead to respiratory problems and other diseases in chickens. It also helps regulate temperature, preventing heat stress and ensuring a comfortable environment for the birds.

Successful farmers keep good records of their farming activities.

(a) Name two specific types of records that would be essential for a farmer raising dairy cattle. (2 marks)

- i. **Production records:** These include daily or weekly milk yield per cow, lactation records, and milk quality test results. They help track individual cow performance and overall herd productivity.
- ii. **Breeding records:** This involves details such as service dates, sire used, calving dates, and calf identification. These records are vital for managing the reproductive cycle of the herd, planning for future calves, and tracking genetic lines.
- iii. **Health records:** These document vaccination dates, deworming schedules, disease outbreaks, treatments administered, and any veterinary interventions. They are critical for maintaining herd health and preventing the spread of diseases.
- iv. **Feeding records:** This includes the type and quantity of feed given to different animals, especially focusing on concentrates and supplements, to monitor feed intake and cost-effectiveness.

(b) What is the primary purpose or benefit of keeping production records (e.g., milk yield, egg collection)? (1 mark)

The primary purpose of keeping **production records** is to monitor and evaluate the performance and productivity of the farm enterprise or individual animals. This allows farmers to identify high-performing animals, make informed decisions regarding culling or breeding, calculate profitability, and optimize resource allocation to improve overall efficiency and output.

32. Farmers use different materials to add nutrients and improve their soil.

(a) Differentiate between materials that are produced from decomposed organic matter (organic fertilizers) and those that are manufactured chemicals (inorganic fertilizers). (2 marks)

Organic fertilizers are natural substances derived from plant and animal residues, such as compost, farmyard manure, and green manure. They improve soil structure, water retention, and microbial activity gradually release nutrients as they decompose. **Inorganic fertilizers**, also known as synthetic or chemical fertilizers, are industrially manufactured compounds containing precise amounts of specific nutrients (e.g., urea, DAP, NPK). They provide readily available nutrients to plants but do not contribute significantly to soil structure or organic matter content.

(b) Give two ways in which growing specific crops like legumes and incorporating them into the soil (green manure) helps to improve soil fertility. (2 marks)

- i. **Nitrogen fixation:** Leguminous crops (like beans, peas, clover) have symbiotic bacteria in their root nodules that can convert atmospheric nitrogen into a usable form for plants (nitrogen fixation). When these legumes are incorporated into the soil as green manure, they release this fixed nitrogen, enriching the soil with a vital nutrient.
- ii. **Addition of organic matter:** Incorporating green manure crops into the soil adds a significant amount of organic matter. This organic matter improves soil structure, enhances water retention, provides food for soil microorganisms, and gradually releases other essential nutrients as it decomposes, leading to overall improved soil fertility and health.

Weeds are unwanted plants that grow in farm fields and gardens.

(a) State two negative effects that weeds have on the crops growing in a field. (2 marks)

- i. **Competition for resources:** Weeds compete with desired crops for essential resources such as sunlight, water, and nutrients. This competition reduces the availability of these resources for the crops, leading to stunted growth, lower yields, and sometimes even crop failure.
- ii. **Harboring pests and diseases:** Weeds can serve as alternative hosts for various crop pests (insects, nematodes) and disease-causing pathogens. This means they can allow pest and disease populations to build up and spread to the cultivated crops, increasing the risk of crop damage and yield losses.
- iii. **Reduced quality of produce:** The presence of weeds, especially during harvest, can contaminate the harvested crop, reducing its quality and market value. For example, weed seeds mixed with grain.
- iv. **Increased cost of production:** Farmers have to spend time, labor, and money on weed control methods, which adds to the overall cost of production.

(b) Outline two methods of controlling weeds that involve using farming practices or manual labour, rather than chemicals. (2 marks)

- i. **Hand weeding/Hoeing:** This involves manually pulling out weeds or using a hoe to cut them at the soil level. It's effective for small areas or when weeds are young and helps prevent chemical use.
- ii. **Crop rotation:** Rotating different crops in a field over time helps break the life cycles of specific weeds that might be adapted to a particular crop. This disrupts their ability to establish and multiply, reducing their population over time.
- iii. **Mulching:** Applying a layer of organic material (like straw, wood chips, or leaves) or inorganic material (like plastic sheeting) on the soil surface smothers weeds by blocking sunlight, thus preventing their germination and growth.
- iv. **Timely cultivation/Tillage:** Ploughing and harrowing the land at appropriate times before planting can bury weed seeds or expose them to the sun, killing them. This helps reduce the initial weed population before the crop is established.

In areas with low or unpredictable rainfall, farmers need to collect and store water.

(a) Name two specific structures that can be built or created on a farm or compound to collect and store rainwater. (2 marks)

- i. **Rainwater harvesting tanks/reservoirs:** These are large tanks or underground structures designed to collect rainwater from rooftops or other impervious surfaces.
- ii. **Dams/Earth dams/Ponds:** These are constructed depressions or barriers across watercourses or natural depressions to impound and store surface runoff water.
- iii. **Water pans:** Smaller, excavated depressions designed to collect and store rainwater, often lined to prevent seepage.

(b) Give two important benefits for a farmer who successfully conserves water on their farm. (2 marks)

- i. **Ensured water availability during dry spells:** Water conservation practices provide a reliable water supply for irrigation, livestock, and domestic use, even during periods of drought or unpredictable rainfall, reducing reliance on external water sources.
- ii. **Increased crop yields and consistency:** With a stable water supply, farmers can irrigate crops when needed, leading to healthier plant growth, improved yields, and more consistent harvests, reducing the risk of crop failure due to water stress.
- iii. **Reduced water bills/costs:** For farmers who previously purchased or pumped water, conserving water reduces their operational expenses, making farming more economically viable.
- iv. **Prevention of soil erosion:** Many water conservation techniques, such as terracing, contour farming, and check dams, also help slow down water runoff, which in turn significantly reduces soil erosion and helps maintain soil fertility.

Your family harvested some fish and wants to preserve it to eat later without refrigeration. Outline two common food items that are often preserved using the method of smoking. (2 marks)

- i. **Fish:** Smoking is a very traditional and effective method for preserving various types of fish (e.g., tilapia, mackerel, salmon). The smoke's compounds and the drying effect inhibit microbial growth and add distinct flavors.
- ii. **Meat:** Different cuts of meat, including beef, pork, and poultry, are commonly smoked to preserve them and enhance their flavor. Examples include smoked sausages, bacon, and ham.
- iii. **Cheese:** Certain types of cheese can be smoked to extend their shelf life and impart a unique smoky flavor.

When preparing food, it is important to prevent the spread of germs. State two specific reasons why food handlers should avoid sneezing or coughing directly over food. (2 marks)

- i. **Contamination with harmful microorganisms:** Sneezing and coughing release airborne droplets containing bacteria, viruses, and other pathogens from the nose and throat. If these droplets land on food, they can directly contaminate it, leading to foodborne illnesses when consumed.
- ii. **Spread of respiratory illnesses:** A food handler who is sick with a cold, flu, or other respiratory infection can easily transmit these illnesses to consumers through contaminated food. Avoiding sneezing/coughing over food is a crucial step in preventing the spread of such diseases within the community.

Task 2: Nutrition

33. You have been asked to plan a balanced lunch meal for a group of teenagers who are very active in sports.

(a) State two important nutritional needs that are particularly high for growing and active teenagers. (2 marks)

- i. **Increased energy (carbohydrates):** Active teenagers have higher energy demands to fuel their growth, daily activities, and sports performance. Carbohydrates are the primary source of quick and sustained energy.
- ii. **Increased protein:** Protein is essential for muscle growth, repair, and recovery after physical activity, as well as for overall growth and development in teenagers.
- iii. **Increased vitamins and minerals:** Active and growing teenagers require more vitamins (especially B vitamins for energy metabolism and Vitamin C for immune function) and minerals (like iron for oxygen transport, calcium for bone health, and potassium for muscle function) to support their development and high activity levels.

(b) Suggest a balanced meal suitable for their lunch, listing three different food items or dishes that provide the necessary nutrients. (3 marks)

Here's a balanced lunch meal suitable for active teenagers:

- i. **Ugali/Rice/Whole-wheat Chapati (Carbohydrates for energy):** These provide the necessary complex carbohydrates for sustained energy release throughout their activities.
- ii. **Chicken/Beef/Lentil Stew with Kales/Spinach (Protein, Iron, Vitamins, and Fibre):** The meat or lentils offer high-quality protein for muscle repair and growth, while the kales or spinach provide essential vitamins (like Vitamin A, C, K), minerals (like iron and calcium), and dietary fiber for digestion and overall health.
- iii. **Fresh Fruit Salad (e.g., Banana, Orange, Watermelon) (Vitamins, Minerals, and Hydration):** Fruits offer quick sugars for immediate energy, a rich source of vitamins (especially Vitamin C), minerals, antioxidants, and contribute to hydration.

34. In your Home Science class, you are learning simple textile crafts like knitting. Name two essential tools specifically used for the craft of knitting. (2 marks)

- i. **Knitting Needles:** These are long, pointed sticks (can be straight, circular, or double-pointed) used to hold the stitches and form the fabric. They come in various sizes to create different stitch gauges.
- ii. **Yarn:** This is the material (typically spun fibers like wool, cotton, acrylic) that is looped onto the needles to create the knitted fabric. It comes in various weights, colors, and fiber compositions.
- iii. **Scissors:** Essential for cutting yarn when casting on, binding off, or joining new yarn.
- iv. **Tapestry Needle/Yarn Needle:** A blunt-tipped needle with a large eye used for weaving in loose ends and seaming knitted pieces together.

Maintaining cleanliness in different parts of the house is crucial. The bathroom requires regular cleaning.

(a) Outline two reasons why cleaning a bathroom regularly is particularly important for hygiene and health. (2 marks)

- i. **Prevents the growth and spread of germs/pathogens:** Bathrooms are often warm and moist environments, making them ideal breeding grounds for bacteria, viruses, and fungi (like mold and mildew) from human waste and body fluids. Regular cleaning with disinfectants helps kill these microorganisms and prevents their spread, reducing the risk of infections and illnesses.

- ii. **Eliminates unpleasant odors:** Accumulated dirt, grime, mold, and bacteria can cause unpleasant odors in the bathroom. Regular cleaning removes the source of these odors, ensuring a fresh and more hygienic environment.
- iii. **Maintains appearance and prevents damage:** Regular cleaning prevents the buildup of soap scum, hard water stains, and grime, which not only look unsightly but can also damage fixtures and surfaces over time.

(b) You find that your kitchen sink is draining very slowly, indicating a blockage. Describe three steps you would follow to safely attempt to unblock the kitchen sink. (3 marks)

- i. **Remove visible debris and flush with hot water:** First, put on gloves and remove any easily accessible food particles, hair, or grease from the sink strainer and drain opening. Then, carefully pour a kettle of very hot (but not boiling) water down the drain. Hot water can often help dissolve grease blockages. Repeat a few times.
- ii. **Use a plunger:** Ensure there's enough water in the sink to cover the plunger's cup. Create a tight seal over the drain opening and rapidly pump the plunger up and down several times. This creates pressure and suction that can dislodge the blockage. Remove the plunger and check if the water drains. You might need to repeat this step a few times.
- iii. **Use a natural drain cleaner (baking soda and vinegar):** If plunging doesn't work, pour about half a cup of baking soda down the drain, followed by half a cup of white vinegar. The chemical reaction creates fizzing that can help break down blockages. Let it sit for 20-30 minutes (or longer for stubborn clogs), then flush thoroughly with hot water. Avoid using chemical drain cleaners as a first resort, as they can be harsh and dangerous if mixed with other chemicals.