

TYPE (D) AGRIC SCIENCE

14

PAPER II

Answer five questions only, one from each section.

SECTION A

1. (a) Enumerate **four** ways by which non-governmental organisations contribute to agricultural development. (4 marks)
- (b) Give **four** reasons government provides agricultural education to nomads in Nigeria. (4 marks)
- (c) State **four** principles of farmstead layout. (4 marks)
- (d) List **four** problems facing farm mechanization in Nigeria. (4 marks)
2. (a) i Differentiate between shifting cultivation and bush fallowing in Agriculture. (2 marks)
- ii Give **two** ways by which leasehold system of land tenure impedes agricultural production. (2 marks)
- (b) Enumerate four agricultural research institute that specialises in processing animals produce. (4 marks)
- (c) Outline **four** precautions that should be observed when using electrical power in the farm. (4 marks)
- (d) A Fadama land surveyed to be triangular in shape has AB 1,000m and BC 2,000m was proposed for establishing banana plantation in the spacing of 400cm $\times$ 400cm. How many suckers will be needed to plant the Fadama land? (4 marks)

SECTION B

3. (a) Enumerate **four** effects of soil acidity on crop production. (4 marks)
- (b) State **four** advantages of mixed farming. (4 marks)
- (c) List **four** ways organic manuring help in soil conservation. (4 marks)
- (d) Give **four** major factors that should be considered before choosing subsurface irrigation method for the production of arable crops on a farmland. (4 marks)
4. (a) Mention **one** organic manure that supplies the following nutrients in an orchard:
 - i. Calcium (1 mark)
 - ii. Nitrogen (1 mark)
 - iii. Phosphorus (1 mark)
- (b) State **two** advantages of drip irrigation over sprinkler. (2 marks)
- (c) Give **three** effects of low pH on the growth of crops. (3 marks)

- d. Explain **two** ways by which the following factors affect agricultural production:
- i. Soil types (2 marks)
 - ii. Soil organisms (2 marks)
- e. The following data were recorded during a laboratory experiment to determine the moisture content of a soil sample:
- mass of evaporatory dish = 2.5g
 mass of evaporatory dish and fresh soil sample = 5.3g
 mass of evaporatory dish and dried soil sample = 4.0g

Calculate the percentage of water by mass of the soil sample. (4 marks)

SECTION C

5. (a) Enumerate **four** conditions that makes the practise of taungya farming in Nigeria necessary. (4 marks)
- (b) Itemise **four** cultural methods of pest control in crop farming. (4 marks)
- (c) Nwala and Sons Goat Farm planted puero on a land measuring $500 \times 1,500$ m at the spacing of 20 cm by 30 cm in May, 2020.
- i. Calculate the area of the pasture land. (2 mark)
 - ii. If 30% of the seeds did not germinate, what will be the total puero population at the end of 2020? (3 marks)
 - iii. Mention **one** cultural practice that should be carried out to achieve the initial expected population of puero by the farm manager. (1 mark)
 - iv. List **two** physical features of puero. (2 marks)
6. (a) Discuss the production of garden egg under the following headings
- i. Land preparation (1 mark)
 - ii. Method of propagation (1 mark)
 - iii. **Two** major pests (2marks)
- (b) Give **four** reasons for the difficulty encountered by farmers in eliminating weeds from crop farms. (4 marks)
- (b) Mention **four** ornamental trees that provide shades in school premises. (4 marks)
- (d) Illustrate with diagram, the F1 and F2 monohybrid inheritance of Mendel's law with a recessive homozygous cotton plant (qq) and dominant homozygous represented with (QQ). (4 marks)

SECTION D

7. (a) List five symptoms of malnutrition in farm animals. (5 marks)
- (b) Itemise five disadvantages of extensive system of managing farm animals. (5 marks)
- (c) A breeder crossed a high beef producing bull (BB) with a high milk producing cow (MM) in 2020. In 2022, he crossed the offspring of the F_1 generation to get F_2 .
- Illustrate the crossings from the parents to the F_2 generation. (3 marks)
 - How many of the F_1 offsprings will be dual purpose calves? (1 mark)
 - What is the ratio of high beef producer to high milk producer in F_2 ? (1 mark)
 - State the genotypic ratio of the offspring in F_2 . (1 mark)
- 8 (a) i. Define the term paddocking in rangeland management. (2 marks)
- ii. Name two types of grazing that should be adopted in an established rangeland. (2 marks)
- (b) With the aid of diagram, represent the life cycle of a liverfluke. (4 marks)
- (c) i. State two phenotypic features that should be considered as a basis for selecting a boar from a herd for breeding purposes. (2 marks)
- ii. Differentiate between inbreeding and linebreeding in animal improvement. (2 marks)
- (d) State four reasons colostrum is important to a new born calf. (4 marks)

SECTION E

9. (a) i. Define opportunity cost. (2 marks)
- ii. State three importance of law of diminishing return in agricultural production. (3 marks)

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(1a)

(i) They provide improved seeds, fertilizers, and other farm inputs to farmers.

- (ii) They organize training programmes and extension services for farmers on modern farming techniques.
- (iii) They provide loans, grants, and financial assistance to farmers and agricultural cooperatives.
- (iv) They sponsor agricultural research and promote the adoption of improved farming technologies.

(1b)

- (i) To improve the literacy level of nomadic pastoralists.
- (ii) To educate nomads on modern livestock management practices.
- (iii) To improve the productivity of livestock and increase farmers' income.
- (iv) To integrate nomads into national development and improve their standard of living.

(1c)

- (i) Farm buildings should be centrally located for easy access.
- (ii) Related buildings should be grouped together to reduce movement and save labour.
- (iii) Adequate drainage and proper sanitation should be provided.
- (iv) Buildings should be located on well-drained, elevated land with good road access.

(1d)

- (i) High cost of agricultural machinery and equipment.
- (ii) Small and fragmented farm holdings.
- (iii) Inadequate skilled operators and maintenance personnel.
- (iv) Poor access to credit and insufficient government support for farmers.

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(2ai)

Shifting Cultivation: Farmers cultivate a piece of land for a few years and then move to a new area, leaving the old land to regain its fertility naturally.

WHILE

Bush Fallowing: Farmers cultivate a piece of land and then leave it uncultivated (fallow) for some years before returning to cultivate the same land again.

(2aii)

- (i) It discourages long-term investment on the land because the farmer does not own it permanently.
- (ii) The payment of rent increases the cost of production and reduces farmers' profits.

(2b)

- (i) National Veterinary Research Institute (NVRI), Vom.
- (ii) National Animal Production Research Institute (NAPRI), Zaria.
- (iii) Nigerian Institute for Trypanosomiasis Research (NITR), Kaduna.
- (iv) Nigerian Institute of Animal Science (NIAS).

(2c)

- (i) Do not operate electrical equipment with wet hands.
- (ii) Ensure all electrical wires and cables are properly insulated.
- (iii) Switch off the power supply before repairing or servicing any electrical equipment.
- (iv) Keep electrical appliances away from water and moisture.

(2d)

Given:

$$AB = 1,000 \text{ m}$$

$$BC = 2,000 \text{ m}$$

$$\text{Spacing} = 400 \text{ cm} \times 400 \text{ cm} = 4 \text{ m} \times 4 \text{ m}$$

Area of triangular land:

$$= \frac{1}{2} \times \text{Base} \times \text{Height}$$

$$= \frac{1}{2} \times 1,000 \times 2,000$$

$$= 1,000,000 \text{ m}^2$$

Area occupied by one banana sucker:

$$= 4 \times 4$$

= 16 m²

Number of suckers required:

= 1,000,000 ÷ 16

= 62,500 suckers

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(3a)

- (i) It reduces the availability of essential plant nutrients.
- (ii) It stunts plant growth and reduces crop yield.
- (iii) It increases the toxicity of minerals such as aluminium and manganese.
- (iv) It inhibits the activities of beneficial soil microorganisms.

(3b)

- (i) It provides both crop and livestock products for the farmer.
- (ii) Animal dung is used as organic manure to improve soil fertility.
- (iii) It reduces the risk of total farm failure.
- (iv) It ensures efficient utilization of land, labour, and other farm resources.

(3c)

- (i) It improves soil structure.
- (ii) It increases the water-holding capacity of the soil.
- (iii) It reduces soil erosion by improving soil stability.
- (iv) It adds organic matter and improves soil fertility.

(3d)

- (i) Soil type and permeability.
- (ii) Availability and quality of water supply.
- (iii) Depth of the water table.
- (iv) Cost of installation and maintenance of the irrigation system.

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(4a)

- (i) Calcium: Bone meal

- (ii) Nitrogen: Poultry manure
- (iii) Phosphorus: Bone meal

(4b)

- (i) It reduces the availability of essential nutrients to crops.
- (ii) It causes poor plant growth and low crop yield.
- (iii) It increases aluminium toxicity, which damages plant roots.

(4ci)

- (i) Soil type determines the fertility and nutrient availability for crop growth.
- (ii) It affects water retention, drainage, and root development, thereby influencing crop yield.

(4cii)

- (i) Soil organisms decompose organic matter and release nutrients for plant use.
- (i) They improve soil structure and aeration, thereby enhancing crop growth.

(4e)

Mass of evaporatory dish = 2.5 g

Mass of evaporatory dish + fresh soil = 5.3 g

Mass of evaporatory dish + dried soil = 4.0 g

Mass of fresh soil = $5.3 - 2.5 = 2.8$ g

Mass of dry soil = $4.0 - 2.5 = 1.5$ g

Mass of water = $2.8 - 1.5 = 1.3$ g

Percentage of water by mass

= $(\text{Mass of water} \div \text{Mass of fresh soil}) \times 100$

= $(1.3 \div 2.8) \times 100$

= 46.43%

Answer: 46.43%

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(6ai)

Clear the land, remove weeds and stumps, plough and harrow the soil to obtain a fine tilth. Make ridges or beds and incorporate organic manure before planting.

(6aii)

Garden egg is propagated by seeds. The seeds are first raised in a nursery and later transplanted to the main field.

(6aiii)

(i) Aphids

(ii) Fruit borers

(6b)

(i) Some weeds produce numerous seeds that spread rapidly.

(ii) Some weeds reproduce vegetatively through rhizomes, stolons, or tubers.

(iii) Weed seeds remain dormant in the soil for many years.

(iv) Some weeds are resistant to herbicides and difficult to eradicate.

(6c)

(i) Neem tree

(ii) Mango tree

(iii) Almond tree

(iv) Flame tree (Royal Poinciana)

(6d)

Check the image

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(8ai)

Paddocking is the practice of dividing a grazing land into smaller enclosed sections called paddocks so that livestock can graze in different sections in rotation.

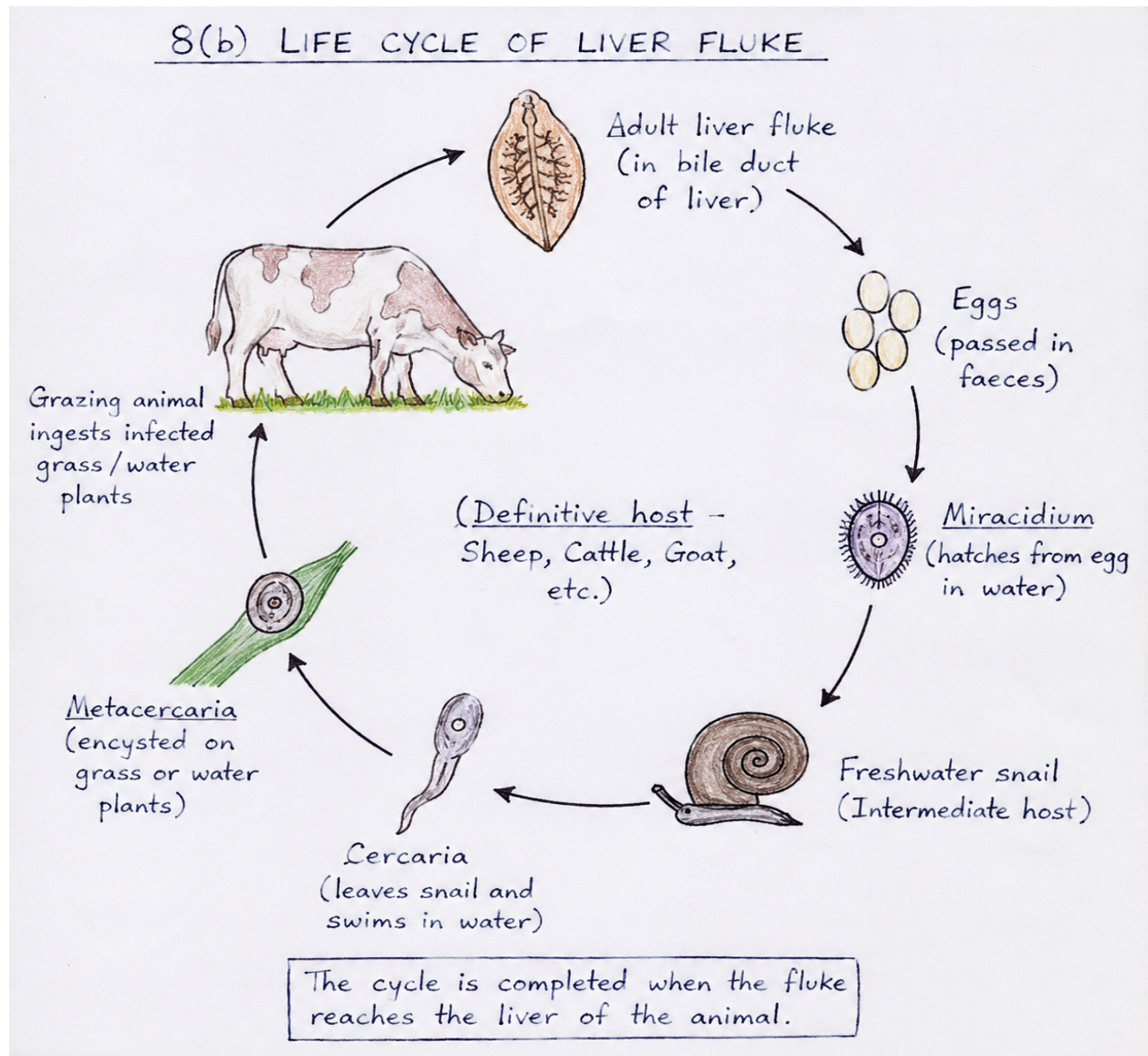
(8aii)

(i) Rotational grazing.

(ii) Strip grazing.

(8b)

Draw the diagram below



(8ci)

(i) Strong, healthy body with good growth rate.

(ii) Well-developed reproductive organs (large, normal testes).

(8cii)

Inbreeding: It is the mating of closely related animals, such as brother and sister or parent and offspring.

WHILE

Linebreeding: It is the mating of animals that are distantly related but descended from a common outstanding ancestor in order to maintain desirable traits.

(8d)

- (i) It provides antibodies that protect the calf against diseases.
- (ii) It supplies essential nutrients and energy needed after birth.
- (iii) It acts as a mild laxative, helping the calf to pass meconium (first faeces).
- (iv) It promotes healthy growth and strengthens the calf's immune system.

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(10ai)

Premium is the amount of money paid by a farmer to an insurance company at agreed intervals in exchange for insurance coverage against possible farm losses or risks.

(10aii)

- (i) High premium (insurance cost).
- (ii) Delay in the payment of compensation (claims).

(10b)

- (i) Planning and organizing farm activities.
- (ii) Supervising and coordinating farm workers.
- (iii) Keeping accurate farm records and accounts.
- (iv) Procuring and managing farm inputs and resources efficiently.

(10ci)

=Television=

- (i) It combines sound and pictures, making agricultural practices easy to understand.
- (ii) It reaches a large number of farmers within a short time.

(10cii)

=Online service=

- (i) They provide quick and up-to-date agricultural information.
- (ii) They enable farmers to communicate easily with extension workers and access information from anywhere with internet access.

(10d)

- (i) They develop improved crop varieties and livestock breeds.
- (ii) They conduct research and generate new farming technologies.
- (iii) They train extension workers and farmers on improved agricultural practices.
- (iv) They produce and distribute research findings and extension publications to farmers.