NATIONAL BUSINESS AND TECHNICAL EXAMINATIONS BOARD AGRICULTURAL SCIENCE (195) - SYLLABUS

INTRODUCTION

The content of this syllabus is divided into nine sections on the conceptual framework on which

the teaching syllabus is organized.

The sections include; Basic concepts, Agricultural Ecology, Agricultural Engineering and Mechanization, Crop Production, Forestry, Ornamental Plants, Crop Protection, Animal Production and Agricultural Economics and Extension.

AIMS

The aims of the syllabus are to:-

- a) Impart in the candidates a functional knowledge and practical skills in Agriculture.
- b) Prepare candidates for further studies in Agriculture.
- c) Prepare candidates for occupation in Agriculture.
- d) Stimulate and sustain candidates' interest in Agriculture.
- e) Enable the candidates to explore the rich Agricultural resources of Nigeria environment.

EXAMINATION SCHEME

There will be two papers: paper1 (Objective and Essay) and paper 2 (Practical), both of which must

be taken. The total marks for both papers is 200 marks.

195 -1 P per 1 (Objective and Essay)

This paper consist of two sections; A and B.

Section A consists of fifty (50) multiple choice questions to be attempted in 50 minutes. The

marks allocated is 50 marks

Section B consists of SEVEN (7) Essay questions drawn from nine sections of the syllabus.

Candidates are expected to answer five questions in 1 hour 40 minutes and the total is 90 marks.

195-2 P per 2 (Test of Practical)

This shall be a 2 hour practical test, either the actual practical or alternative to practical. It shall consist of four (4) compulsory questions, for a total of 60marks. The actual practical shall be taken by schools during May/June Examinations WHILE the alternative to practical shall be taken by private candidates during Nov/Dec Examinations.

| S/N | TOPIC/OBJECTIVE | CONTENTS | ACTIVITIES |
|-----|---|---|---|
| 1. | A. BASIC CONCEPTS | | |
| 1.0 | Meaning and importance of agriculture. 1.1 Define agriculture 1.2 Identify the different branches/areas of agriculture | a) Definition and branches of agricultural science b) Importance of agriculture to the individual, community and nation. | Ask the student for definition and branches of Agriculture |
| 2.0 | 1. Problems of agricultural development and possible solutions 1.1 Identify and discuss problems of agriculture development in Nigeria | a) Problems related to: i. Land tenure ii. Basic amenities iii. Finance iv. Transportation v. Storage and processing facilities vi. Agricultural education and extension vii. Tools and machinery viii. Farminputs Marketing | Assessment would include: incidence of pests and diseases, vagaries of weather, labour and government policy. |
| 3.0 | 1. Meaning and differences between subsistence and commercial agriculture 1.1 Student should explain the meaning of subsistence and commercial agriculture | a) Meaning of subsistence and commercial agriculture b) Difference between subsistence and commercial agriculture based on their characteristics c) Advantages and disadvantages of subsistence and commercial agriculture d) Problems of subsistence and commercial agriculture | Discuss the meaning and the differences between subsistence and commercial agriculture |
| 4.0 | 1. Roles of government in agricultural development 1.1 State roles of government in provision of: i. Agricultural finance ii. Agricultural education etc | a) Agricultural finance: (i) Credit (ii) Subsidy b) Agricultural education c) Agricultural extension services d) Agricultural policies and programmes | Guide discussion on Agricultural finance and Agricultural Education etc. Assessment would cover past and present programme e.g OFN., ADP, Farm settlement, Agricultural sector Rehabilitation Project (ASRP) and National Aids Co-ordination. |
| 5.0 | 1. Role of non-governmental organization in agricultural development 1.1. Explain the meaning and importance of NGOs | a) Meaning of non- governmental organization (NGOs) b) Roles of NGOs in agricultural Association | Examples of NGOs west African rice development (WARDA), International institute for tropical agriculture (IITA), International livestock centre for Africa (ILCA), International Crop Research Institute for semi-arid tropics (ICRISAT) would be assessed. |

| S/N | TOPICS/OBJECTIVES | CONTENTS | ACTIVITIES/REMARKS |
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| | | | |

| 6.0 | 1. Agricultural laws and reforms | a) | Land tenure system in west Africa | Assessment would |
|-----|--|----|---|--------------------------|
| | 1.1 List land tenure system | b) | Government laws on land use in | include land use act in |
| | 1.2 Explain | | (Decree). Land reforms West Africa. | West Africa. |
| | a) Inheritance | C) | Advantages and disadvantages of land | |
| | b) Individual | | (Decree) and reforms in West Africa. | |
| | B. AGRICULTURAL ECOLOGY | | | |
| 7.0 | 1. Meaning and importance of | a) | Meaning of agricultural ecology and | |
| | agriculture ecology | | ecosystem. | |
| | 1.1 Define agricultural ecology | b) | Components of farm ecosystem e.g. | |
| | and ecosystem | | biotic and abiotic. | |
| | 1.2 Explain some basic concepts | C) | Interactions of the components in | |
| | in ecology | | interaction of farm the terrestrial and | |
| | | | aquatic agro-crops/animals with | |
| | | | ecosystem, other components of the | |
| | | | ecosystem in farm settling such as | |
| | | | mono or sole cropping system, mixed | |
| | | | cropping system, mixed farming | |
| | | | system, fish ponds and forest (rain or | |
| | | | savannah) | |
| 8.0 | 1. Land and its uses | a) | Meaning of land | Assessment would |
| | 1.1 Students should be able state | b) | Characteristics of land free gift of | include of uses of land |
| | a) Meaning of land | | nature, immobile, limited supply etc. | forestry and agriculture |
| | b) Characteristics of land | | i. Agricultural purposes:-crop | for agriculture. |
| | | | production; 💦 🧹 | |
| | | - | Wild life conservation/game, reserve;- | Non-agricultural uses of |
| | | | livestock production etc. | land such as Health |
| | | | ii. Non-agricultural purposes: | Centres, Mosques, |
| | | - | Industry | Mining, Recreational |
| | | - | Housing | schools and Markets |
| | | - | Transport etc | would be assessed |
| 9.0 | Factors Affecting land Availability | | a) Physical factors | Student should be guided |
| | for Agricultural purpose:- | - | Soll type | on this discussion. |
| | Identify factors affecting | - | lopography | |
| | land availability for | - | Land degradation | |
| | agricultural purpose | - | Soli pollution | |
| | | ١. | | |
| | | - | Of industrias | |
| | | | Or muustries Mining/mineral exploitation | |
| | <i>N</i> | | Pecreation/tourism | |
| | | - | c) Socio cultural factors | |
| | | | L and tenure system | |
| | | 1 | Religious purpose (church mosque and | |
| | | - | chrino) oto | |
| 1 | | 1 | Sinne) etc | 1 |

| S/N | TOPICS/OBJECTIVES | CONTENTS | ACTIVITIES/REMARKS |
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| 10.0 | 1. Agro-allied industries and relationship | a) Agro-based industries and raw | Assessment would include |
| | between agriculture and industry | materials, pulpwood; | other agro-based industries |
| | 1.1 List the agro-based industries | Beverage industry – cocoa | and raw materials e.g. |
| | 1.2 State raw materials in each industry | soap industry-oil | Leather industry meat and |
| | | b) Relationship between | fish. |
| | | agriculture and industries. | Assessment includes other |
| | | Agriculture provides market | between agriculture |
| | | for industrial products e.g. | industrial workers. |
| | | Farm machinery, chemicals, | |
| | | ship | |
| 11.0 | 1. Environmental factors affecting crop | a) Climatic factors e.g. rainfall, | The student should be |
| | and animal distribution and production | temperature, light, wind, | guided on the practical |
| | 1.1 state and explain climatic factors | relative humidity. | activity |
| | affecting crop and animal distribution and | b) Biotic factors e.g. predators, | |
| | production | parasites, soil micro- | |
| | | organisms, pests, patnogens | |
| | | and weeds, interrelationship | |
| | | such as competition, | |
| | | (symbiosis) | |
| | | c) Edaphic factors: soil nH soil | |
| | | texture soil structure soil | |
| | | type etc | |
| 12.0 | 1. Rock formation | A. Types of rock: | Assessment would cover |
| | 1.1 student should be able to | i. Igneous | identification. description |
| | a. Define rock | ii. Sedimentary | and examples of rock types. |
| | b. Identify types of rocks | iii. Metamorphic | Assessment would cover |
| | 5 51 | B. Process of rock formation | how igneous, sedimentary |
| | | | and metamorphic rocks are |
| | • | | formed. |
| 13.0 | Soil formation and profile development | a) Factors of soil formation, | Theroleplayedbyeach |
| | 1. Define soil | the parent rock, | would be assessed. The |
| | 2. List factors of soil formation | organisms, climate, | meaning importance and |
| | | topographyfactorinsoil | description. |
| | | formation and time. | |
| | | b) Processes of soil | |
| | | i Dhysical wasthering | |
| | | i. Physical weathering | |
| | | a) Soil profile development | |
| 14.0 | Types composition and properties of soil | a) Types of soil | Assessment would cover |
| 0.7.0 | 1 Students should be able to | b) Chemical and biological | types of soil and their |
| | recognize the different type of soil | composition of soil | separation into sand silt and |
| | 2. Define soil pH | i. Soil macro and micro | clay. |
| | 3. Determine pH of different soil | nutrients, fractions, | |
| | types | water holding | |
| | 4. State ways of correcting soil | ii. Soil water; capacity, | Determination of soil causes |
| | acidity | porosity | and correction of soil |
| | - | iii. Soil macro-organisms; | acidity/alkalinity would be |
| | | capillarity, consistency | assessed. |
| | | iv. Soil microbes, etc | |
| | | v. Soil air | |
| | | c) Soil pH | |
| | | d) Physical properties of soil; | |
| | | i. Soil texture | |
| | | II. Soil structure | |

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|------|--|--|---|
| 15.0 | Plant nutrients and nutrients cycle Students should be able to distinguish between macro and micro nutrients List the macro nutrients State the functions of each macro nutrient State their deficiency symptoms | a) Macro and micro nutrients; macro-nutrients such their functions and deficiency as N, P, H, Ca, S and symptoms in crops. Micro-nutrients such as && b) Factors affecting availability of Zn, Fe, Mo, Co, Bo, Cu nutrients in soil such as pH, excess of other nutrients, leaching crop removal, oxidation and burning. c) Methods of replenishing last types of fertilizers and nutrients, e.g. crop rotation, methods of fertilizer organic manuring, fertilizer application, application would be fallowing, liming, cover-cropping assessed. d) Nitrogen, carbon, water and phosphorus cycles. e) Organic agriculture meaning and importance of nitrogen, carbon and water cycles | Assessment should be on the preparation of water/sand culture to demonstrate deficiency of various elements in different crops. Charts should be prepared for each nutrient cycle. Assist the students to prepare compost manure and farm yard manure. |
| 16.0 | Irrigation1. Define irrigation2. Describe underground irrigation | a) Meaning of irrigation system b) Types of irrigation system i. Overhead e.g. sprinkler ii. Surface e.g. flooding, furrow/channel, basin, border, iii. Underground e.g. perforated pipes, dripes. c) Advantages and disadvantages of irrigation system d) Importance of irrigation e) Problems associated with irrigation | Assessment should be based on charts to show types of irrigation system. |
| 17.0 | Drainage 1. Students should be able to a) Define drainage b) State importance of drainage | a) Meaning of drainage b) Importance of drainage c) Types of drainage systems; i. Surface drainage e.g. channel, furrow ii. Surbsurface/underground drainage d) Advantages and disadvantages of drainage system. | Demonstrates the various drainage system on the water logged areas of the school farm. |
| 18.0 | Agricultural pollution 1. Student should be able to a. Define pollution b. State the causes of agricultural land pollution | a) Meaning of agricultural pollution b) Causes/sources of pollution of agricultural lands and fishponds; i. Excessive application of agricultural chemicals ii. Marine and soilspillage iii. Livestock waste and drug disposal etc. c) Effects of land/pond pollution. Ways of minimizing land, on farmers and agricultural pond pollution. | Student should be shown around some polluted land/pond in the locality. |

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| | C. AGRICULTURAL ENGINEERING MECHANISM | | Assessment would include identification, description and uses of each of the tools. |
| 19.0 | Simple farm tools 1. Describe simple farm tools | a) Meaning of simple farm tools. b) Types of simple farm tools-cutlass, hoe, spade, shovel etc. c) General maintenance of simple farm tools | Assessment would include the meaning uses/functions and identification of different parts of each of the farm machinery and implements. Engineering details are however not required. |
| 20.0 | Farm machinery and implements 1. Identify types of farm machinery 2. State the uses of farm machine | a) Farm machinery; i. Tractor ii. Bulldozer iii. Shellers iv. Dryers v. Incubators vi. Milking machines vii.Combine harvester etc viii. Sprayers etc | Assessment would include precaution measures in the use of farm machinery |
| 21.0 | Maintenance practices and precautionary measures1. Explain the meaning of tractor/coupled2. List the parts and functions of a plough, harrow and ridgers | a) Reasons for maintaining farm b) Maintenance of farm machinery i. Check water and oil levels regularly | Assessment would include precautionary measures in the use offarm machinery |
| 22.0 | Agricultural mechanization 1. List the disadvantages of agricultural mechanization | a) Meaning of agricultural mechanization b) Mechanized agricultural operations c) Advantages and disadvantages of agricultural mechanization d) Limitations of agricultural mechanization | Mechanized agricultural operations; ploughing, harrowing, planting or harvesting, milking etc. |
| | Prospects of agricultural mechanism | Possible ways of improving agricultural mechanization such as developing less expensive machines and establishing agricultural engineering schools for personnel and fabricate simple machine, etc. | Guides class discussion |
| 23.0 | Farm power 1. Define farm power 2. Explain and state the advantages of human power | a) Sources of farm power b) Advantages and disadvantages of different sources of farm power | Guides class discussion |
| 24.0 | Farm surveying 1. Define farm surveying 2. Survey equipment | a) Farm survey i. Meaning of farm surveying ii. Common survey equipment iii. Uses of farm survey equipment iv. Maintenance of farm survey equipment v. Importance of farm survey b) Farm planning i. Meaning of farm planning Engineering details ii. Importance of farmstead planning | Assessment would cover site selection, location of structures, sketching of farm layout |

| | iii. | Importance of farmstead planning | |
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| S/N | TOPIC/OBJECTIVES | CONTENTS | ACTIVITIES/REMARKS |
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| 25.0 | D. CROP PRODUCTION Classification of crops | c) Principles of farmstead planning i. Meaning of farmstead ii. Importance of farmstead planning iii. Factors to be considered in the design of a farmstead iv. Farmstead layout | Display of a collection of crop |
| | | uses e.g. cereals, pulses, roots, tubers, vegetables etc. b) Classification based on their life cycle crop listed is presumed. E.g. annual, biannual, perennial. c) Classification based on their morphology e.g. monocotyledonous and dicotyledonous crop. | seeds, fruits or leaves. |
| 26.0 | Husbandry of selected crops 1. Student should be able to describe the production of the selected crops e.g. cereal, groundnut etc, under the following headings Origin Local and common name Varieties/types Climates/soil requirements | Botanical names and common names of the crops, varieties/types, climatic and soil requirements, land preparation, methods of propagation, planting date, seed rate, spacing, sowing depth and nursery requirements, cultural practices, supplying, thinning, manuring and fertilizer requirement and application, weeding, pests and disease control, harvesting and processing and storage of at least one representative crop from each of the following crop grouping: a) Cereals e.g. maize, rice, guinea corn, millet b) Pulses (grain legumes) e.g. cowpea, soya bean, pigeon pea c) Roots and tubers e.g. cassava, yam, potatoes d) Vegetables e.g. tomatoes, onion, amaranthus, okro, cauliflower, spinach e) Fruitse.g. citrus, banana, pineapple f) Beverages e.g. cocoa, tea, coffee g) Spices e.g. pepper, ginger h) Oils e.g. groundnut, sheabutter, sunflower, oil palm i) Fibres e.g. cotton, jute, sisal hemp j) Latex e.g. rubber k) Others sugar cane etc. | Supervise cultivation of crops suited to local environment |
| 27.0 | Pasture and forage crops 1. Explain the meaning of pasture | a) Meaning of pasture and forage crops. | Assessment would include the botanical names and |
| | and forage cropsState uses of forage cropsList types of pasture and | b) Uses of forage cropsc) Types of pastured) Common grasses and legumes of | characteristics |
| | characteristics of each type4. Identify the main pasture | common grasses used for grazing livestock. e) Factors affecting the distribution | |

| grazing livestock and p | roductivity |
|---------------------------|-------------|
| of pasture | |
| f) Establishment of pastu | Ire |
| g) Management practices | sofpasture |

| S/N | TOPICS/OBJECTIVES | CONTENTS | ACTIVITIES/REMARKS |
|------|--|--|--|
| 28.0 | Crop improvement. 1. Student should be able to; i. Enumerate the aims of crop improvement ii. Explain the methods of crop improvement iii. State the mendels law | a) Aims of crop improvement b) Methods/processes of crop improvement e.g. introduction, selection, breeding. c) Mendels laws of inheritance d) Advantages and disadvantages of crop improvement | Assessment would include the meaning of crop improvement. Mendels 1 st and 2 nd of genes would be assessed. |
| | E. FORESTRY | | |
| 29.0 | Forest management Students should be able to; 1.1 Define the meaning if forest and forestry 1.2 State the importance of the forest and forestry 1.3 State forest regulations in Nigeria 1.4 State and discuss forest management practices in Nigeria | a) Meaning of forestand forestry b) Importance of forestry c) Forest regulations d) Forest management practices e) Implications of deforestation Ago-forestry practices in West Africa a) Meaning of agro- forestry b) Agro-forestry practices i. Taungya syatem ii. Alley cropping iii. Ley farming etc. | Common tree species suitable for agro-forestry would be assessed. |
| | F. ORNAMENTAL PLANTS | | |
| 30.0 | Meaning and importance of ornamental plants 1.1 Explain the meaning of ornamental plants 1.2 Identify local ornamental plants | a) Meaning of ornamental plants b) Importance of ornamental plants | Ornamental plants found in locality would be assessed |
| 31.0 | Common types of ornamental plants 1.1 Mention ornamental plants uses for different purpose 1.2 Identify ornamental plants belonging to each category | a) Types of ornamental plants according to their uses i. Bedding (Mostly flowering frication plants) ii. Hedging plants iii. Lawn grassesetc b) The common and botanical names | Assessment would cover identification of various types of ornamental plants. Examples of ornamental plant for each setting or location |
| 32.0 | Settings and location for planting ornamental plants. Students should be able to; 1.1 Identify locations or settings requiring ornamental plants 1.2 Determines ornamental plant for eachlocation. | Location/settings and types of ornamental plants needed:- - Avenues - In front of building etc. | Provide representative of ornamental plant foreach setting or location |

| 33.0 | Methods of cultivation ornamental plants |
|------|--|
| | and importance of each method and |
| | examples of ornamental |
| | 1.1 Mention methods of propagating |

| i. | By seed | |
|----|---------|--|
| | | |

ii. Vegetative propagation

| Ornamental plants 1.2 Discuss importance of each method 34.0 Maintenance of ornamental plants should be able to; ornamental plants 1.1 List maintenance operations of ornamental plants Maintenance operations 1.2 Discuss reasons for carrying out each operations Maintenance operations 1.3 Carry out the operations in any established ornamental site. • Watering 0. G. CROP PRODUCTION • Watering 35.0 DISEASES OF CROPS Student should be able to; ornamental plants • Watering 1.1 List maintenance operations in any established ornamental site. • Watering 0. G. CROP PRODUCTION • Watering 35.0 DISEASES OF CROPS Student should be able to; • Meaning of disease 1.1 List the effects of disease on crop production • Disease: causal organism economic, prevention 1.3 Name the important diseases of major crops • Disease: causal organism economic, prevention 1.4 State the causalorganism of each disease • Creal smut, rice blast, leaf rust etc 1.5 State the preventive and control measures • Everages- cocco black prevatore to with server with each ordinate read daming of Control. 36.0 Pest of crops 2 Students should be able to; 1. Classifica | S/N | TOPIC/OBJECTIVES | CONTE | NTS | ACTIVITIES/REMARKS |
|--|------|--------------------------------------|--------------|--------------------------------|----------------------------|
| 1.2 Discuss importance of each method 1.3 Give examples of ornamental plants propagated through each method Maintenance operations/Activities of ornamental plants: Reasons for carrying out maintenance operations: watering, mulching, pruning etc would be assessed 334.0 Maintenance of ornamental plants Maintenance operations of ornamental plants: • Watering 1.1 List maintenance operations of ornamental plants • Watering • Watering 1.2 Discuss reasons for carrying out each operations • Watering • Wutching 1.3 Carry out the operations in any established ornamental site. • Pruning, etc. assessed 6. CROP PRODUCTION 5. Carsop production • Mulching • Sudent should be able to; • Mulching 1.3 Istate the meaning of disease or grago production • Disease: causal organism economic, prevention inportance, mode of transmission, symptoms, and control. • Crecel smut, rice blast, leaf rust etc ii. Legunes corcoa black pod, swollen shoot, coffee leaf rust etc v. Fruits citrus gummosis, dieback • Fruits citrus gummosis, dieback 36.0 Pest of crops a) Meaning of pests Nature of damage, economic inportance, prevention inon-insect pests 36.0 Pest of crops a) Meaning of pests Nature of damage, economic inportance, preventive and control measures of each of see to gests • Classification of pests Nature of dama | | Ornamental plants | | | |
| 34.0 Maintenance of mamental plants propagated through each method Maintenance of mamental plants Reasons for carrying out omamental plants: | | 1.2 Discuss importance of each | | | |
| 1.3 Give examples of ornamental plants propagated through each method 34.0 Maintenance of ornamental plants Students should be able to; 1.1 Listmaintenance operations 1.2 Discussreasonsforcarrying out each operations each operations 35.0 DISEASES OF CROPS Student should be able to; 1.1 State meaning of disease on crop production 1.2 List he effects of disease on crop production 1.3 State the exausal organism of each disease 1.4 State the preventive and control measures 1.5 State the preventive and control measures 1.6 Cerops 36.0 Pest of crops 36.0 Pest of crops 36.0 Pest of crops 1.1 Classify insects pests 1.2 Classify insects pests 1.3 Discuss the important insect pests of major crops 1.4 Recorging and the able to; 1.5 State the preventive and control measures 1.6 Vegetables root knot of tomate and ping of controls 1.7 Classify insects pests based | | method | | | |
| ach method 34.0 Maintenance of ornamental plants Students should be able to; Maintenance operations/Activities of ornamental plants Reasons for carrying out maintenance operations: 1.1 List maintenance operations of ornamental plants · Watering vatering 1.2 Discuss reasons for carrying out each operations · Watering vatering 1.2 Discuss reasons for carrying out each operations · Watering vatering 3.3 DISEASES OF CROPS • Mulching assessed 35.0 DISEASES OF CROPS • Meaning of disease on crop production Assessment would include at least two include at | | 1.3 Give examples of ornamental | | | |
| 34.0 Maintenance of ornamental plants Students should be able to; 1.1 List maintenance operations/Activities of ornamental plants: 1.2 Discussreasonsforcarryingout each operations 1.3 Carry out the operations in any established ornamental site. Maintenance operations/Activities of ornamental plants: Watering Reasons for carrying out watering, mulching, pruning etc would be assessed 35.0 DISEASES OF CROPS Student should be able to; 1.1 State the meaning of disease of major crops a) Meaning of disease b) Assessment would fundate at least two fundate at least fundate at least two fundate at least two fundate at | | plants propagated through | | | |
| 34.0 Maintenance or ormamental plants Maintenance operations of ornamental plants: Maintenance operations of ornamental plants: Maintenance operations maintenance operations 1.1 Listmaintenance operations of ornamental plants Maintenance operations Maintenance operations Maintenance operations 1.2 Discussreasonsforcarrying out each operations in any established ornamental plants Maintenance operations Maintenance operations: Maintenance operations: 35.0 DISEASES OF CROPS a) Meaning of disease on crop production State the meaning of disease on crop production Assessment would include at least two fungal, two viral, two bacterial and one nematode disease of major crops Assessment would include at least two fungal, two viral, two bacterial and one nematode disease of the consol organism of each disease State the preventive and control measures I. State the preventive and control measures I. Cereal smut, rice blast, leaf rust etc II. Legumes cerospra leaf spot, rosette etc III. Beverages- cocoa black Disease: cocoa black 36.0 Pest of crops a) Meaning of pests Nature of damage, economic importance, preventive and control measures Control the singed spatter of the moning of pests Nature of damage, economic importance, preventive and control measures Control table spatter of the moninsect pests of major crops Astasite fore table spatter of the moning of pests | 04.0 | each method | NA - in to a | | D |
| 1.1 List maintenance operations of ornamental plants Ontamental plants watering 1.2 Discuss reasons for carrying out each operations Mulching pruning etc. would be assessed 3.3 Carry out the operations in any established ornamental site. Pruning, etc. assessed 35.0 DISEASES OF CROPS a) Meaning of disease Assessment would include at least two fungal, two viral, two bracterial and one nematoded isease of major crops Assessment would 1.1 State the meaning of diseases of major crops a) Meaning of disease (cons), prevention Assessment would 1.3 Name the important diseases of major crops i. Cereal smut, rice blast, leaf rust etc ii. Legumes cerospora leaf spot, mosette etc iii. Legumes cerospora leaf spot, mosette etc iii. Legumes cerospora leaf spot, mosette etc iii. Legumes cerospora leaf spot, mosette etc iv. Tubers in cassava mosaic, black pod, swollen shoot, coffee leaf rust etc iv. Tubers in cassava mosaic, black pod, swollen shoot, coffee leaf spot, mosette etc iv. Tubers in cassava mosaic, black rust etc iv. Tubers in cassava mosaic, black rust etc iv. Tubers in cassava mosaic, blight of cottonetc iv. Vi. Vegetables rootknot of tomato and damping off, Onion twister etc iv. Tubers in cassava mosaic, blight of cottonetc iv. State the commouth parts with ests of major crops iv. State the commouth parts with ests of major crops iv. Non-insect pests iv. Nature of damage, economic inportance, preventive and control measu | 34.0 | Maintenance of ornamental plants | Mainter | ance operations/Activities of | Reasons for carrying out |
| 1.1 Exting withing in withing i | | 1.1 List maintenance operations of | | /atering | watering mulching |
| 1.2 Discuss reasons for carrying out each operations - Pruning, etc. assessed 1.3 Carry out the operations in any established ornamental site. - Pruning, etc. assessed 35.0 DisEASES OF CROPS - - Assessment would include at least two fungal, two viral, two include at least two fungal, two viral, two incrop production - Assessment would include at least two fungal, two viral, two bacterial and one mematodedisease of major crops 1.4 State the causal organism of each disease - - Control. - Control. - Control. - - rust etc ii. Legumes cerospora leaf spot, rosefte etc iii. Legumes cerospora leaf spot, rosefte etc iii. Legumes cerospora leaf spot, rosefte etc iiii. Legumes cerospora leaf spot, rosefte etc iiiiiiiiii Legumes cerospora leaf spot, rosefte etc iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii | | ornamental plants | - V | lulching | pruning etc would be |
| 11 Carry outthe operations in any established ornamental site. 6. CROP PRODUCTION Assessment would include at least two fungal, two viral, two fungal, | | 1.2 Discuss reasons for carrying out | - P | runing, etc. | assessed |
| 1.3 Carry out the operations in any established ornamental site. G. CROP PRODUCTION 35.0 DISEASES OF CROPS Student should be able to; 1.1 State the meaning of disease on crop production 1.2 List the effects of disease on crop production 1.3 Name the important diseases of major crops 1.4 State the causal organism of each disease 1.5 State the preventive and control measures 1.5 State the preventive and control measures State the preventive and control measures Verget best protocome of transmission, symptoms, and control measures State the preventive and control measures Verget best protocome of transmission, symptoms, and control. Cereal smut, rice blast, leaf rustetc I. Egumes cerosporal leaf spot, rosette etc II. Betverages - cocca black pod, swollen shoot, coffee leaf rustetc Vergetables rootknotof tomato and damping off. Onito twister etc Viii. Stored produce mould etc 36.0 Pest of crops Students should be able to; 1.1 Classify pests intoinsects and non-insects pests 1.2 Classify pests intoinsects and non-insects pests based on ther mode of mouth part 1.3 Discuss the important insect pests of major crops 1.4 Recognize and name the a Meaning of chewing b Eitrag andchewing c Biting andchewing c Biting andchewing c Biting andchewing | | each operations | • | . a | |
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| iii. Beverages- cocoa black pod, swollen shoot, coffee leaf rust etc iv. Tubers in cassava mosaic, bacterial, leaf blight etc v. Fruits citrus gummosis, dieback vi. Fibre black arm/bacteria blight of cotton etc vii. Vegetables root knot of tomato and damping off, Onion twister etc viii. Stored produce mould etc 36.0 Pest of crops Students should be able to; 1.1 Classify pests into insects and non-insects pests 1.2 Classify insects pests based on their mode of mouth part 1.3 Discuss the important insect pests of major crops 1.4 Recognize and name the iii. Deverages- cocoa black pod, swollen shoot, coffee leaf rust etc iv. Tubers in cassava mosaic, bacterial, leaf blight etc v. Fruits citrus gummosis, dieback vi. Vegetables root knot of tomato and damping off, Onion twister etc viii. Stored produce mould etc a) Meaning of pests b) Classification of pests i. Insect pests i. Insect pests i. Insect pests i. Biting and chewing ii. Piercing and sucking | | | 2 | spot, rosette etc | |
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| non-insects pestsii. Non-insect pestsmeasures of each of the non-insect pests1.2 Classify insects pests based on their mode of mouth partc) Classification of insect-pest based on mouth parts with examples; i. Biting and chewing ii. Piercing and suckingmeasures of each of the non-insect pests | | 1.1 Classify pests into insects and | , , | i. Insect pests | preventive and control |
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| 1.3 Discuss the important insect pests of major cropsexamples; i. Biting and chewing1.4 Recognize and name theii. Piercing and sucking | | their mode of mouth part | | based on mouth parts with | be assessed. |
| pests of major crops i. Biting and chewing 1.4 Recognize and name the ii. Piercing and sucking | | 1.3 Discuss the important insect | | examples; | |
| 1.4 Recognize and name the II. Piercing and sucking | | pests of major crops | | I. Biting and chewing | |
| important storage incost posts | | 1.4 Recognize and name the | | II. Plercing and sucking | |
| of farm produce d) Important of insect pasts of | | of farm produce | d) | III. DUIIIY | |

| 1.5 State the meaning of pests | major crops, field and storage pests, life cycle, economic importance, nature of damage, preventive and control measures of the | |
|--------------------------------|---|--|
| | following major insect-pests of crops; | |

| S/N | TOPICS/OBJECTIVES | CONTENTS | ACTIVITIES/REMARKS |
|------------|--|---|--|
| <u>37N</u> | | i. Cereals stem borer, army worm, earthworm etc ii. Legumes pod borer, aphids, sucking bugs and leaf beetle iii. Beverages cocoa myrids (capsids) iv. Tubers yam beetle, cassavamealy bugs, green spider mites, variegated grasshopper v. Fibre cotton stained, bull worms vi. Fruits and vegetable trips Leaf beetle, scale insect, grasshopper, leafroller, vii. Stored produce grain weevils, bean beetle e) Non insect pest e.g. birds, rodents etc f) Side effects of preventive and control methods Chemical pollution, poisoning Biological Cultural harmful effects of burning etc g) General effects/economic importance of pests. | ACTIVITIES/REMIARNS |
| 37.0 | Weeds Students should be able to; 1.1 Define weeds 1.2 List various types of weeds with their botanical names 1.3 List the various features of weeds | a) Meaning of weeds b) Types of weeds c) Effects of weeds on crops and economy d) Characteristics features of weeds e) Methods of controlling weeds; cultural, biological, chemical, physical and mechanical methods | Common and botanical names would be assessed |
| | H. ANIMAL PRODUCTION | methods | |
| 38.0 | Types and classification of farm animals 1.1 List the different types of farm animals | a) Types of farm animals: cattle, sheep, goat, poultry, pig, rabbit, fish etc b) Classification of farm animals according to: Habitat, terrestrial and aquatic Uses, food, protection, pet etc | Drawing and labelling of parts of farm animals would be assessed identification of important organs and their functions would be assessed |
| 39.0 | Anatomy and physiology of farm animals 1.1 Draw and label parts of a farm | a) Parts of farm animals b) Organs of farm animals e.g. heart, liver, lungs | Assessment would include the digestive system of poultry, differences |

| animals | c) Systemsoffarmanimalse.g. | monogastric and ruminant |
|----------------------------|-------------------------------|--------------------------|
| 1.2 Dissect a farm animal | digestive system, circulatory | systems |
| 1.3 Sketch these parts and | system, respiratorysystem | |
| mention their functions | | |

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| S/N | TOPIC/OBJECTIVES CONTENTS | | ACTIVITIES/REMARKS |
|------|--|---|--|
| 40.0 | Animal reproduction Student should be able to; 1.1 Explain the role of sex hormones in reproduction 1.2 Describe process of egg formation 1.3 Explain the process of reproduction in mammals and poultry 1.4 Draw and labels the parts of the male and female reproductive systems. | a) Meaning of reproduction b) Roles of hormones in reproduction of farm animals c) Reproductive systems of farm animals d) Process of reproduction in farm animals e) Egg formation in poultry | Assessment would include oestrus cycle, heat period, mating, gestation period, parturition, lactation, colostrums, mammary glands, signs of heat, ovulation etc. Assessment would include extensive, intensive and semi-intensive system of management and record keeping in livestock management. |
| 41.0 | Environmental physiology Students should be able to; 1.1 Explain the meaning of environmental physiology 1.2 State the effects of climate changes | a) Meaning of environmental physiology b) Effects o changes in climatic factors such as Temperature Relative humidity Light on; growth, reproduction, milk production, egg production etc. | Students should be guided on this discussion. |
| 42.0 | Livestock management Student should be able to; 1.1 State the meaning of livestock management 1.2 State the requirement for good livestock management 1.3 Explain the importance of these management practices to livestock | a) Meaning of livestock management b) Requirements for livestock management; housing, feeding, hygiene and finishing of at least one ruminant and one non- ruminant from birth to market weight c) Importance of management practices | The biochemical details of the nutrients are not required. Assessment would include the types of diet for the various classes of animals, their characteristics and supplementary feeding |
| 43.0 | Animal nutrition Student should be able to: 1.1 Classify feeds 1.2 Mention sources and functions of food nutrients 1.3 State the different types of rations/diet and their uses 1.4 State causes and symptoms of malnutrition and their corrections in farm animals | a) Meaning of animal nutrition b) Classification of feeds c) Sources and functions of feed nutrients d) Types of ration/diet and their uses; components of a balanced diet, production and maintenance rations. e) Causes and symptoms of malnutrition and their correction in farm animals | Assessment would include malnutrition related conditions such as ketosis, rickets. Assessment would also include differences and similarities between breeds (local, exotic and cross/hybrid) and performance of animals. |

| 44.0 Rangeland and pasture Students should be able to; 1.1 State the meaning of range land 1.2 List the importance of range land 1.3 State the characteristics of range land 1.4 Mention some common grasses of livestock range land 1.5 State factors affecting the level of production of herbage 45.0 Animal improvement Students should be able to; 1.1 explain the meaning of animal improvement 45.0 State the aims of animal improvement 1.3 Describe the various methods of a nimal improvement 1.4 State the effects of each a) Meaning and importance of rangeland/pasture to livestock and the characteristics of range land. b) Common grasses and legumes in range land c) Factors affecting the level of production of herbage a) Meaning and importance of rangeland/pasture to livestock and the characteristics of range land. c) Factors affecting the level of production of herbage d) Methods of range land and pasture improvement d) Methods of range land and pasture improvement d) Methods of ranimal improvement d) Meaning of animal improvement i. Introduction ii. Breeding d) Artificial insemination ii. Meaning of artificial insemination ii. Methods of collecting semen iii. Advantages and disadvantages of |
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| 1.4 State the effects of each III. Advantages and disadvantages of |
| method and process on artificial incompation |
| animal improvement |
| 46.0 Animal health management a) Meaning of disease Assessment would include |
| Students should be able to: b) Causal organisms: viruses bacteria identification, specimens |
| 1.1 Define diseases fungi and protozoa of common endo and |
| 1.2 State the causal c) Factors that could predispose ecto-parasites, and charts |
| organisms of animal animals to diseases: health status of for life cycles of selected |
| diseases animals, nutrition, management etc endo and ecto-parasites. |
| 1.3 Identify some ecto and (d) Reaction of animal to diseases: |
| endo-parasites of susceptibility and resistance to |
| livestock diseases |
| 1.4 Name some important e) Causal organism, symptoms, mode of |
| diseases of livestock and transmission, effects, prevention and |
| their causal organism control of the following selected |
| i Virelfect and mouth rinderpect |
| Newcastle |
| ii Bacterial anthrax brucellosis |
| tuberculosis |
| iii. Fungal-aspergilosis, ring worm. |
| scabies |
| iv. Protozoa-trypanomiasis, |
| coccidiosis |
| f) Parasites |
| i. Meaning of parasite |
| ii. Types of parasites |
| III. Mode of transmission, life |
| cycle, economic importance |
| and control of the following |
| liverfluke and roundworm |
| ectoparasites ticks. lice |

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| S/N | TOPIC/OBJECTIVES | CONTE | NTS | ACTIVITIES/REMARKS |
|------|--|----------------------------|---|--|
| | | g) | General methods of prevention and control of diseases and parasites; quarantine, inoculation/immunization, hygiene, breedingfor resistance etc. | |
| 47.0 | Aquaculture | a) | Meaning of agriculture | Assessment would include |
| | Student should be able to; 1.1 Define aquaculture and name different types of aquaculture. 1.2 Explain the meaning of fish farming 1.3 State the importance of farming 1.4 State the conditions necessary for sitting a fish pond 1.5 Establish and maintain a fishpond 1.6 Identify different fishing tools | c) c) d) e) | Different types of agriculture; i. Fish farming ii. Shrimp farming iii. Crab farming Meaning and importance of fish farming Conditions necessary for sitting a fish pond Establishment and maintenance of fish pond Eishery regulations | aeration, stocking, feeding, harvesting, processing and preservation of fish |
| | and their uses. | a) | Fishing methods and tools | |
| 48.0 | Agriculture or bee keeping Students should be able to; 1.1 State the meaning of agriculture 1.2 List different types of bees 1.3 State importance of bee keeping 1.4 Prepare equipment for bee keeping and produce quality honey 1.5 State various methods of bee keeping and their uses. | a) b) c) d) e) | Meaning of apiculture or bee keeping Types of bees i. Indigenous bees ii. Exotic bees Importance of bee keeping Methods of bee keeping i. Traditional method ii. Modern bee keeping hives, hive tools like suits, smokers, jungle boots, brushes etc Precautionary measures in bee keeping i. Locate apiaries are from human dwellings ii. Put warning symbols near apiary etc | Charts or pictures bee should be displayed. |
| | I. AGRICULTURAL ECONOMICS AND EXTENSION | | | |
| 49.0 | Basic economic principles Students should be able to; 1.1 Listthe basic economic principles 1.2 Discuss the basic economic principles | a) b) c) d) | Scarcity Choice Scale of preference Law of diminishing returns | Assessment would be on discussion and demonstration |
| 50.0 | Factors of production 1.1 Define factors of production 1.2 Mention examples of factors of production 1.3 Discuss each factor of production | a) b) c) d) | Land Capital Labour characteristics and classification Managementor entrepreneur | Assessment would be based on the factors of production. |

| S/N | TOPICS/OBJECTIVES | CONTENTS | ACTIVITIES/REMARKS |
|------|--|--|-----------------------------|
| 51.0 | Principles of demand | a) Definition of demand | |
| | 1.1 State the meaning of demand | b) Law of demand | |
| | 1.2 State the law of demand | c) Factors affecting | |
| | 1.3 List the factors that affect the demand for | demand for | |
| | agricultural goods and services. | agriculture | |
| | | d) Movements along the | |
| | | demand curve | |
| | | e) Shifts in the demand | |
| | | curve | |
| 52.0 | Principles of supply | a) Definition of supply | |
| | 1.1 State the law of supply | b) Law of supply | |
| | 1.2 List the factors that affect supply; movements | c) Movements along | |
| | along the supply curve and the shift variables | supply curve | |
| | | d) Shifts in the supply | |
| | | curve | |
| | | e) Factors affecting the | |
| | | supply of agricultural | |
| | | produce | |
| 53.0 | Implications of demand and supply for | a) Price support | Discussion by drawing |
| | agricultural production | b) Price control | examples from real life |
| | 1.1 To discuss the meaning of price support | c) Subsidy programme | situation e.g buffer stock, |
| | 1.2 Explain the meaning of price stabilization and | and its effects on | grain release by |
| | control | agricultural production | government. |
| 54.0 | Functions of a farm manager | a) Meaningofafarm | Use concept map to |
| | 1.1 explain meaning of farm manager | manager | outline the function of |
| | 1.2 State the functions of a farm manger | b) Functions of a farm | Manager and relationship |
| | | manager | in the detailed activities |
| 55.0 | Problems faced by farm manager | Problem of farm | Discussion and exposition |
| | 1.1 State the problems that farm managers face in | Managers:- | |
| | the production process | - Inadequaterarm | |
| | | - Inadequate | |
| | | | |
| 56.0 | Agricultural finance | sources of inputs. | Accompant would include |
| 50.0 | Student should be able to: | a) Meaning Of | the meaning of agric |
| | 1.1 Define agricultural finance | b) Importance of | business |
| | 1.1 Define agriculturarilitatice | | business. |
| | agricultural finance | c) Sources offarm | |
| | 1.3 Determine and discuss sources of farm | finance | |
| | financing | d) Classes offarm | |
| | 1.4 Mention types of credit based on periods and | credit | |
| | sources of credit | i Classification based | |
| | 1.5 Mention problems faced by farmers in | on length of time. | |
| | procuring agricultural credit | - Short-term credit | |
| | 1.6 State the meaning agric-business | - Mediumtermcredit | |
| | 1.7 State the source of fund for capital market | - Long-term credit | |
| | | ii. Classification based | |
| | | on source of credit | |
| | | Institution crodit | |
| | | | |
| | | iii. Classification based | |
| | | iii. Classification based on liquidity; | |
| | | iii. Classification based on liquidity; - Loan-in cash | |

| S/N | TOPIC/OBJECTIVES | CONTENTS | ACTIVITIES/REMARKS |
|------|---|---|---|
| | | e) Problems faced by farmers in procuring agricultural credit High interest rate Lack of inadequate collateral etc f) Problems faced by institutions in granting loans to farmers: Lack of records and accounts etc g) Capital market Meaning of capital market, institutions that deal with medium and long term loans for agricultural business. Institution involved in the capital market; Bonds Insurance companies Merchant banks The stock exchange (sales and purchases of shares) Roles of capital markets in agricultural business; Mobilization of long term funds for on lending Reduce over reliance on money marker etc | |
| 57.0 | Farm records and accounts 1.1 State the importance of farm records and account 1.2 State types of farm records. 1.3 Develop a farm record. | a) Importance of farm records b) Types of farm records i. Inventory records ii. Production records iii. Income and expenditure records iv. Supplementary or special records c) Designing farm records d) Farm accounts; i. Expenditure/purchases account ii. Income/sales account iii. Profit and loss account iv. Balance sheet | Assessment would include terms such as salvage value, appreciation, farm budget, depreciation, inventory, their importance and their uses in calculating profit and loss of farm items like crops, livestock, farm machinery and tools in the farm. |
| | | | |

| S/N | TOPIC/OBJECTIVES | CO | INTENTS | AC | TIVITIES/REMARKS |
|------|--------------------------------------|-----------|---|-----|-------------------------|
| 58.0 | Marketing of agricultural produce | a) | Meaning and importance of | 1. | Discussion and |
| | 1.1 State the meaning and | | marketing of agricultural produce | | demonstration of |
| | importance of agricultural | b) | Marketing agents and their | | some of the |
| | marketing | | functions | | functions of |
| | 1.2 List the various marketing | C) | Marketing functions: | | marketing agent. |
| | agents/channels | | | 2. | Identification of |
| | 1.3 State the advantages and | | | | Marketing problems |
| | disadvantages of the various | -12 | III. Processing etc | | In and around their |
| | Channels | a) | Marketing of export crop | | locality. |
| | r.4 List the functions performed by | e) f) | Export crop in west Airica | | |
| | 1.5 Importance of exporte to | (1) | Wost Africa | | |
| | adricultural development | a) | Cooperate bodies, cooperative | | |
| | agricultural development | 9) | societies and individuals engaged in | | |
| | | | exporting agricultural produce e g | | |
| | | | ANCE- Association of Nigerian | | |
| | | | Cooperative Exporters | | |
| | | h) | Importance of exporting agricultural | | |
| | | | produce | | |
| | | i) | Problems of marketing agricultural | | |
| | | , | problems | | |
| 59.0 | Agricultural insurance | a) | Meaning of agricultural insurance | As | sessment would be on |
| | Student should be able to; | b) | Importance agricultural insurance | the | meaning, importance |
| | 1.1 Define agricultural insurance | C) | Types of insurance policies for | an | d types of agricultural |
| | 1.2 Name types of insurance that can | | agricultural production | ins | urance with practical |
| | be taken by agricultural operators | | Specific enterprise insurance | exa | amples. |
| | | | e.g. crop insurance, livestock | | |
| | | | insurance | | |
| | | | ii. Farm vehicle insurance | | |
| | | | III. Firedisaster insurance or | | |
| | | | machines and buildings | | |
| | | | insurance | | |
| | | | workers etc | | |
| | | d) | | | |
| | | u) (0) | Problems of agricultural insurance: | | |
| | | • | Lincertainties of weather | | |
| | | - | Loses due to natural disaster etc. | | |
| 60.0 | Agricultural extension | a) | Meaning and importance of | As | sessment would |
| | 1.1 State the meaning and | | agricultural extension | inc | lude various teaching |
| | importance of agricultural | b) | Agricultural extension methods; | aid | s used in extension e.g |
| | extension. | , | i. Individual contact methods etc | cha | art, GSM, TV, etc and |
| | 1.2 List agricultural extension | | ii. Group contact methods etc | fie | d visit with extension |
| | programmes in Nigeria. | C) | Agricultural extension programmes | ag | ent tofarmers. |
| | 1.3 State some methods of | | in west Africa E.g. illiteracy among | | |
| | disseminating information to | | farmers. | | |
| | farmers. | | | | |
| | 1.4 State some methods of | | | | |
| | disseminating information to | | | | |
| | tarmers. | | | | |
| | 1.5 List problems faced by | | | | |
| | agricultural extension agents in | | | | |
| | Nigeria. | | | | |

LIST OF AGRICULTURAL SCIENCE TEXTBOOK

- 1. Essential Agricultural Science for Senior Secondary School by O.A. IWENA
- 2. Agricultural Science for Senior Secondary School by M.K. KOMOLAFE & D.C. TOY
- 3. Senior Secondary Agricultural Science by O.A. AKINSANMI
- 4. Atextbook of Agricultural Science for School & College by A.C. ANYANWU, B.D. ANYANWU, V.A. ANYANWU.
- 5. Prescribed Agricultural Science for Senior Secondary school by S.A. OMORUYI U.X. ORHUE

A.A. AKEROBO

C.I. AKHIMEN

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