JAMB SYLLABUS

AGRICULTURE

GENERAL OBJECTIVES

The aim of the Unified Tertiary Matriculation Examination syllabus in Agriculture is to prepare the candidates for the Board's examination. It is designed to test their achievement of the course objectives, which are to:

- stimulate and sustain their interest in Agriculture;
- 2. acquire basic knowledge and practical skills in Agriculture;
- 3. acquire the knowledge of interpretation and the use of data;
- 4. stimulate their ability to make deductions using the acquired knowledge in Agriculture.

The syllabus is divided into five sections as given below:

- A. General Agriculture
- B. Agronomy
- C. Animal Production
- D. Agricultural Economics and Extension
- E. Agricultural Technology

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DETAILED SYLLABUS

SECTION A: General Agriculture

TOPICS/CONTENTS/NOTES	OBJECTIVES
1. Meaning and Scope of Agriculture	Candidates should be able to:
a. Definition of Agriculture	use the definition of Agriculture in modern terms as it relates to production, processing and marketing.
b. Branches of Agriculture	differentiate between the various branches of Agriculture.
c. Types of Agriculture i.e subsistence and commercial	differentiate between the various types of Agriculture.
2. Importance of Agriculture	Candidates should be able to:
i. Provision of raw materials for agro-allied industries	relate agro-allied industries to their respective raw materials
ii. Provision of employment	relate the various contributions

	of Agriculture to economic
iii. Development of rural areas,	development in West Africa.
etc.	
3. Agricultural Ecology	Candidates should be able to:
a. Ecological zones of West Africa	differentiate between the
	features of the ecological zones
	in West Africa
	III West Affica
b. Agricultural products of each	classify agricultural products
ecological zone	according to each ecological
	zone.
c. Environmental factors and	differentiate abiotic from biotic
their effects on crop and	factors affecting agricultural
livestock production	production.
ilvestock production	production.
4. Genetics	Candidates should be able to:
a. First and second laws of	apply the first and second laws of
Mendel	Mendel to genetics.
b. Cell division	differentiate between the types
ST CON GIVISION	differentiate between the types

locus, i.

e.g.

Terminologies

c.

of cell division.

determine

the

outcome

of

alleles, genotype, dominance

crossing genetic involving homozygous and heterozygous traits.

ii. compute simple probability ratios.

5. Farm Inputs

Candidates should be able to:

e.g. planting materials, agrochemicals, etc.

classify different types of farm inputs and their uses.

History of Agricultural | Candidates should be able to: 6. **Development in West Africa**

Agricultural systems e.g. compare various a. cultivation, shifting bush fallowing, etc.

agricultural systems.

Problems b. of development e.g. land tenure inadequate systems, infrastructures, finance agriculture, pollution, etc.

Agricultural identify the problems and proffer solutions

Establishment of C. research institutes e.g.

national i. trace the history of research NCRI, institutes from past to present.

IAR, IAR&T, CRIN, NIFOR, FRIN, ii. RRI, NRCRI, NIHORT, LCRI, etc. development of agriculture. give international and institutes e.g. IITA, ILRI, ICRISAT, WARDA, etc., leading increased application to of science to the development of agriculture.

their role the assess research reasons for the establishment of ADPs.

- Agricultural Development d. Projects (ADPs) e.g. RTEP, FADAMA etc.
- National e. programmes such as OFN, NAFPP, NALDA, Green Revolution, NCRPs, NARP, Project Coordinating Unit (PCU) etc.

agricultural evaluate the contributions of national agricultural programmes.

7. Roles of Government and Candidates should be able to: **NGOs Agricultural** in **Development**

a. Development of fiscal policies agricultural favourable to production e.g. import duties, ban on importation, e.t.c.

evaluate the effects of government policies on agricultural development.

b. Agricultural laws and reformse.g Land Use Act.

identify agricultural laws and their effect on agricultural production

- c. Government programmes
 aimed at agricultural
 development e.g. subsidies,
 credit facilities, e.t.c.
- programmes i. identify the various agricultural agricultural incentives provided by the subsidies, government.
 - ii. assess their effects on agricultural development.
- d. Provision of infrastructurese.g. transport systems,communication systems, e.t.c.
- compare the various infrastructural facilities provided by government and their uses.
- e. Contribution of NGOs to agricultural development
- examine the roles of NGOs in the development of agriculture.

SECTION B: Agronomy

TOPICS/CONTENTS/NOTES	OBJECTIVES
1. Rocks and Soil formation	Candidates should be able to:
a. Factors affecting rock weathering and soil formation	identify major types and properties of rocks and soils; factors and processes of soil formation.
b. Physical properties of soili. Soil profile	differentiate between the horizons in a soil profile.
ii. Soil texture and structure	 i. differentiate between the components of soil. ii. compute the proportion of soil constituents. iii. analyse soil into its constituents parts. iv. determine the water-holding capacity of soil.
c. Chemical properties of soil	determine the soil pH.
i. Soil acidity and alkalinityii. Chemical components of soil	

e.g. silicate

2. and Soil Water Conservation

Soil | Candidates should be able to:

- movement, sources, management and conservation.
- Soil water: its importance, i. compare capillary, gravitational and hygroscopic water.
 - determine water-holding ii. capacity, wilting points and plant available/unavailable water.
- Soil conservation: meaning and importance, causes, effects, prevention and control leaching, erosion, continuous cropping, burning and oxidation of organic matter.
- i. identify the causes of erosion and leaching.
- of ii. determine control methods.

- Irrigation C. and methods.
- drainage i. classify irrigation and drainage systems.
 - ii. examine the importance and challenges irrigation of and drainage.

3. Soil Fertility

- a. Macro and micro-nutrients and i. classify plant nutrients.

their in plant nutrition: roles carbon, water and nitrogen cycles

ii. identify factors affecting their availability.

soil (flora and fauna), and their roles in soil fertility

b. The living population of the examine the roles of soil flora and fauna in maintaining fertility.

- c. Maintenance of soil fertility: Methods of maintaining soil fertility e.g. use of cover crops, application of organic manures, etc.
- i. compare the different methods of maintaining soil fertility.
- ii. differentiate between organic and inorganic fertilizer, and their methods of application.
- iii. determine common fertilizer ratios.
- d. Nutrient deficiency symptoms e.g. chlorosis, sickle leaves, stunting, apical necrosis etc.
- i. identify the deficiency symptoms and their causes.
- ii. suggest remedies.

4. Land Preparation and Soil **Tillage**

Candidates should be able to:

a. Principles and practices of land preparation and soil tillage

i. compare the different methods of land preparation and soil tillage in relation to different b. Factors affecting choice of tillage methods: Zero tillage, minimum tillage, etc.

groups of crops.

ii. for the give reasons the advantages and disadvantages of land preparation and soil tillage.

give reasons for the choice of tillage methods.

5. Plant Forms and Functions

Candidates should be able to:

crop plants and their functions

- a. Parts of monocot and dicot i. identify crop plant parts and their functions.
 - ii. distinguish between monocot and dicot crop plants

b. The anatomy and morphology of the storage organs of common crop plants

differentiate the various storage organs of crop plants

6. Growth, Development and Reproduction

Candidates should be able to:

a. Gametogenesis

examine the process of gamete formation.

b. Pollination

give reasons for different types of pollination.

c. Fertilization

analyse the process of fertilization.

d. Embryo formation and development

trace the process of embryo formation and development to the formation of seeds and fruits.

7. Plant Propagation Methods

Candidates should be able to:

a. Sexual: the use of seeds, seed viability, viability test, seed rate and seed germination

- i. classify crops propagated by sexual methods.
- ii. determine seed viability and seed rate.
- iii. differentiate between types of seed germination.
- iv. examine the conditions for seed germination.
- b. Asexual (vegetative propagation) e.g. cutting,budding, grafting, layering, e.t.c.

classify crops into different vegetative propagation methods.

- c. Nursery and nursery management
- i. determine appropriate nursery sites, types; their advantages and disadvantages.
- ii. apply the techniques of

8. Cropping Systems, Planting **Patterns and Plant Densities**

Candidates should be able to:

transplanting seedlings

- Cropping systems: a. Monocropping, mixed-, multiple-, inter-, relay-, strip and rotational cropping
- i. compare cropping systems.
- different ii. apply cropping systems to solve problems in agriculture.
- b. Planting patterns: Broadcasting, row spacing and drilling

differentiate between the various planting patterns.

- and multiple stands
- c. Plant densities: single, double i. examine the various types of plant densities and their effects on crop yield.
 - ii. compute plant density per hectare.

9. Crop Husbandry

Candidates should be able to:

Common and scientific names, i. apply the different methods of gross morphology, anatomy of organs, methods storage husbandry propagation, practices, harvesting, processing

crop propagation, husbandry, of harvesting, processing and storage for each crop.

and pests, economic importance of the following groups of crops.

Group 1: Cereals e.g maize, guinea corn, rice

Group 2: Legumes e.g. cowpea, groundnut, soyabean

Group 3: Tubers e.g. yam, cassava, sweet potatoes

Group 4: Vegetables and Spices e.g. tomatoes, egg plant, pepper, onions, okra, cabbage, Amaranthus sp.

Group 5: Fruits e.g. citrus, pineapple, pawpaw

Group 6: Beverages e.g. cocoa, kola, coffee

Group 7: Oils e.g. oil palm, coconut, shea butter

and storage, common diseases ii. identify common diseases and pests and their effects on crop yield.

> iii. determine the economic importance of each of the crops.

> iv. relate their importance to national economic development.

Group 8: Latex e.g. para rubber, gum arabic

Group 9: Fibres e.g jute, cotton, sisal hemp

Group 10: Sugars e.g sugarcane, beet

10. Pasture and Forage Crops

methods of propagation and husbandry of common pasture forage grasses and legumes. Establishment, maintenance, conservation and uses of pastures and forage crops.

b. Study of natural grasslands relate and their distribution in West Africa

c. Range management

Candidates should be able to:

- a. Study of gross morphology, i. classify common grasses and legumes used as pastures and
 - ii. differentiate between pasture and forage crops by their common and scientific names.
 - iii. distinguish between the various methods of conserving pastures e.g. hayand silagemaking.

different vegetational zones to their dominant pasture species.

determine range types and

11. Floriculture

and of maintenance uses ornamental trees, shrubs and flowers

12. Weeds

a. Gross morphology, methods of i. identify weeds with reproduction, dispersal and effect of weeds

b. Weed control methods weeding, mulching, cover cropping, tillage, herbicides and trap cropping

13. Crop Diseases

Identification of a. causing organisms both in store store and field disease - causing

utilization of range resources in Nigeria

Candidates should be able to:

Identification, establishment, i. distinguish between common ornamental trees, shrubs and flowers.

> ii. determine their uses and maintenance.

Candidates should be able to:

their common and scientific names.

ii. classify weeds according to their mode of dispersal.

apply various weed control methods.

Candidates should be able to:

disease- distinguish between common and in the field.

- b. A simple account of diseases i. relate various disease-causing caused by fungi, bacteria, nematodes and viruses; the l nature of the damage, methods of transmission and common methods of control.
- c. Side effects of application of relate each control method to its preventive and control methods pollution, poisoning and e.g distribution of ecosystem.

14. Crop Pests

- a. General account of pests of agricultural plants both in the field and in the store, their types, importance, principles and methods of prevention and control
- b. Life cycles of: biting insects i. describe the life cycles e.g. grasshopper; boring insects

organisms.

- organisms to the damage caused, symptoms and their mode of spread.
- ii. apply appropriate control methods.

side effect.

- i. identify the various field and store pests.
- ii. their economic assess importance.
- iii. relate various prevention and control methods to different pests.
- various insects.
- e.g. weevils; sucking insects e.g. ii. apply the knowledge of the life

aphids and cotton strainer.

cycles of insect pests to their prevention and control.

c. Common pesticides and their i. differentiate between common side effects

- pesticides.
- ii. examine their mode of action on pests.

15. Forest (Silviculture)

Management | Candidates should be able to:

pulp, fibre and other forest their uses. products

a. Importance: Source of wood, relate various forest products to

b. Conservation: regulation, i. exploitation, regeneration, afforestation, agro-forestry and ii. apply the various methods taungya system

- compare different forest conservation methods.
- appropriately.

16. Crop improvement

Candidates should be able to:

Methods of crop improvement e.g. introduction, selection, crossing, quarantine e.t.c.

- i. give reasons for crop improvement.
- ii. distinguish between various methods of crop improvement.

SECTION C: Animal Production

TOPICS/CONTENTS/NOTES	OBJECTIVES
1. Forms and classification of major farm animals in West Africa	Candidates should be able to:
a. Species, breeds and distribution	i. classify various breeds of farm animals.
b. External features of cattle, sheep, goat, pigs, rabbits and poultry	ii. locate where they are found. identify their features.
2. General terminology in	Candidates should be able to:
animal production	
Common terms used in animal husbandry, e.g. calving, kidding, castrate, capon, veal, mutton, e.t.c.	
3. Anatomy and physiology of farm animals	Candidates should be able to:
a. Functions of tissues and	distinguish between various

organs of farm animals

functions of tissues and organs of farm animals.

b. Animal body systems e.g. digestive (ruminants and nonruminants), reproductive, respiratory, urinary (excretory) and nervous systems.

compare different body systems in farm animals.

Effect environmental c. of physiological changes on development of farm animals e.g. climate change

determine the effects of climate change on farm animals

Reproduction 4. in farm animals

Candidates should be able to:

- a. Gametogenesis, oestrus cycle, i. give an account of the process signs of heat and heat periods, secondary sexual characters, gestation periods, parturition and the role of hormones in reproduction.
- of reproduction in farm animals.
 - ii. determine the role of hormones in reproduction.

b. and birth of the young. Mammary lactation glands and

Development, nourishment trace the development in farm animals from fertilization to birth in farm and care of the young.

animals.

c. Egg formation, incubation and hatching in poultry.

trace the of egg process formation and incubation in poultry.

5. Animal nutrition

a. Feed nutrients and functions

identify the various feed nutrients, their sources and functions.

- ration formulation balanced ration, common pasture/forage formulation. crops e.g. guinea grass, elephant ii. relate the various types giant star grass, grass. Andropogon sp, Calopogonium | livestock. sp. Hay and silage preparation, different types of rations, namely maintenance ration and production ration.
- b. Feeds and feeding: Simple i. differentiate between the types of animal feeds and their
 - rations to different classes of

- and symptoms of malnutrition deficiencies in farm animals. their and correction farm in animals.
- c. Nutrient deficiencies: Causes i. trace symptoms to nutrient
 - ii. apply appropriate corrective measures to nutrient deficiencies

6. Livestock management

Housing, feeding, sanitation and veterinary care of ruminants, pigs, rabbits and poultry under intensive, semi-intensive and extensive systems of management from birth to slaughter.

in farm animals.

Candidates should be able to:

apply the different management practices for farm animals.

7. Animal Health

- a. Animal diseases (pathology)
- i. Environmental factors predisposing animals to diseases;
 causal organisms, symptoms,
 transmission and effects.
- ii. Preventive and curative methods for diseases caused by viruses, bacteria, fungi and protozoa.
- b. Parasites (parasitology)

- i. identify diseases of farm animals and causative agents.
- ii. classify livestock diseases based on symptoms and mode of transmission.
- iii. apply appropriate preventive and curative measures against diseases caused by these pathogens.
- i. classify livestock parasites.
- ii. determine their role in disease

- i. Life cycles and economic importance of livestock parasites
 e.g. endoparasites, ectoparasites
 and disease vectors.
- ii. Prevention and control
- dipping
- spraying
- deworming
- sanitation

8. Fisheries and Wildlife

- a. Fish culture systems; Common types of fishes e. g *Tilapia, Catfish*, etc.
- i. Extensive systems: inland and deep sea fishing, lakes and rivers.
- ii. Semi-intensive systems: dams
- iii. Intensive systems: fish ponds
- Factors to consider in ponds
 establishment and pond
 management e.g. pond
 fertilization, liming and desilting.

transmission.

iii. trace life cycles of parasites from egg to adult stage.

- i. identify the common types of fishes in West Africa.
- ii. differentiate between various systems of fish farming in West Africa.
- iii. determine the factors to be considered in intensive fish farming.

- b. Fish harvesting and processing methods
- i. Use of drag nets, hook and line, etc.
- ii. Curing, sun-drying and smoking.
- iii. Fishery regulations
- c. Wildlife management Habitat conservation, feeding, domestication, harvesting, wildlife and processing regulations.
- 9. Bee-keeping (Apiculture)
- Meaning and importance of apiculture
- b. Types of bees e.g exotic and indigenous bees

- i. assess the advantages and disadvantages of different fish harvesting and processing methods.
- ii. use the various methods of catching fish.
- iii. apply the various methods of fish preservation. apply fishery regulations in Nigeria.
- i. identify animals found in West African game reserves.
- ii. give reasons for the establishment of game reserves.
- wildlife iii. apply common regulations.

Candidates should be able to:

relate bee-keeping to economic development

differentiate between various types of bees

c. Methods of bee-keeping e.g classify methods of bee-keeping

traditional and modern beekeeping

d. Equipment and safety measures in beekeeping apply appropriate prevention and control methods against livestock parasites.

safety identify bee-keeping equipment apply and their uses

10. Animal Improvement

Methods of animal improvement e.g. introduction, breeding, quarantine and selection:
Breeding systems – inbreeding, line-breeding, cross-breeding, artificial insemination

- i. give reasons for animal improvement.
- ii. differentiate between the various methods of animal improvement.

SECTION D: Agriculture Economics and Extension

TOPICS/CONTENTS/NOTES	OBJECTIVES
1. Factors of agricultural production	Candidates should be able to:
a. Land	i. understand the meaning of land and state its usesii. identify the various forms of
i. Types of land ownership in West Africa	land ownership. iii. examine their effects of land ownership on agriculture. iv. differentiate between the various features of land and their effects on land use.
b. Labour	differentiate between the types and sources of labour and their effects on agricultural production.
c. Capital	compare the sources of capital and associated problems.
d. Management	determine the functions of a farm manager in an agricultural enterprise.

2. Basic Economic Principles

Candidates should be able to:

a. Demand and supply

- i. relate demand to supply in agricultural production.
- ii. interpret geographical representation of demand and supply.
- b. Production function: Input/input, Output/output Input/output relationships; stages of production, concepts of diminishing returns, scale of
- i. relate input to output.
- deduce economic concepts from graphic representation.

Features of Agricultural *Candidates should be able to:* 3. **Production**

preference and choice.

Smallness of farm holdings: limits of biological farm production and susceptibility of ii. compute elasticity of demand farm production to climate, seasonality of farm productions, price elasticity in demand and supply of agricultural produce.

- i. distinguish between the common features of agricultural production and produce.
- and supply.

4. Labour Management

a. Labour relations: Supervision, etc.

identify the various ways of achieving labour efficiency.

b. Types of labour: Permanent differentiate between the various labour etc.

types and sources of labour.

National labour laws C. and regulations.

apply national labour laws and regulations.

5. Farm Management

Candidates should be able to:

Qualities, functions and a. problems of a farm manager.

identify the qualities, functions and problems of a farm manager.

- b. Records and record-keeping: Types and importance of record- livestock records, keeping profit and loss account book.
- i. differentiate between the types of farm records.

c. Stock evaluation:

ii. give reasons for keeping farm records.

- i. gross and net profits in farm management.
- determine gross and net margins, appreciation, depreciation and salvage value
- ii. Appreciation, depreciation and savage value
- i. examine the relevance of agricultural insurance
- ii. determine the appropriate

agricultural insurance scheme d. Agricultural insurance: determine the problems agricultural associated with i. Meaning, importance and types insurance. of agricultural insurance ii. **Problems** of agricultural insurance **6. Marketing of Agricultural** *Candidates should be able to:* **Produce** a. Importance of Marketing. evaluate the importance of agricultural marketing b. Marketing channels. i. classify marketing agents and their functions. ii. determine the various ways in which marketing channels pose agricultural problems in production. determine the characteristics of c. Characteristics of agricultural agricultural products affecting products affecting their their marketing. marketing.

7. Agricultural Extension

Candidates should be able to:

a. Meaning and importance.

identify the importance of agricultural extension.

b. The role of Agricultural Development programmes, universities, research institutes and farmers' organizations (Cooperative societies).

Agricultural analyse the roles of government rogrammes, and non-governmental organizations in agricultural extension education.

c. Extension methods including demonstration plots, use of visual aids, mass media, etc.

differentiate between the various extension methods.

- d. Problems of agricultural i.extension in West Africa and agree possible solutions.Af
- i. examine the problems of agricultural extension in West Africa.
 - ii. provide possible solutions.

SECTION E: Agricultural Technology

TOPICS/CONTENTS/NOTES	OBJECTIVES
1. Farm surveying and farmstead planning	Candidates should be able to:
a. Meaning and importance	examine the relevance of farm surveying to agriculture.
b. Common surveying	classify common surveying
equipment, their uses and care	equipment, their uses and care.
c. Common survey methods	differentiate between the common survey methods.
d. Principles of farmstead outlay.	apply survey principles to
	farmstead outlay.
2. Simple farm tools	Candidates should be able to:
	i. identify simple farm tools.
	ii. use and maintain farm tools.
	iii. compare the advantages and
	disadvantages of simple farm tools.

3. Farm machinery and	Candidates should be able to:
implements	
a. Types	identify common farm machinery
	and implements.
i. Machinery e.g tractor, milking	i. classify farm machinery
machine etc	according to their uses.
ii. Implements	ii. apply appropriate maintenance
	routines on
	iii. operate farm machines and
h liese and maintanance of farm	implements.
b. Uses and maintenance of farm	
machinery and implements	
4. Mechanization and sources	Candidates should be able to:
of farm power	Carraraces stream se asic ter
a. Sources of farm power e. g.	compare the advantages and
animal and machines	disadvantages of various sources
	of farm power and their
	application.
b. Advantages and disadvantages	distinguish between the
of agricultural mechanization	advantages and disadvantages of
	mechanization.

c. Problems and prospects of mechanized agriculture in West Africa

assess the problems and prospects of mechanized agriculture in West Africa.

5. Processing and storage

Candidates should be able to:

a. Processing: traditional and modern methods of food processing e.g. gari, rice and groundnut processing, etc.

- i. identify the importance of agricultural processing.
- ii. differentiate between the various methods of processing agricultural produce.

b. Storage

- compare different storage methods.
- ii. apply different storage methods.

6. Introduction to biotechnology

to Candidates should be able to:

Basic terms, e.g. tissue and another culture in vitro fertilization and genetic engineering

- i. use basic terms in biotechnology.
- ii. provide reasons for the importance and application of biotechnology.

7. Application of ICT in

agriculture

a. Features of computers

identify the various components of a computer.

b. Uses of computers in agriculture: disease and weather forecasting, ration formulation, database and simulation studies, etc.

use the computer to enhance agricultural practices.

c. Use of communication gadgets
e.g mobile phone, internet, etc.
farm machines and implements.

use communication gadgets to enhance agricultural production.

8. Introduction to agricultural research and statistics

Candidates should be able to:

a. Basic concepts in planning agricultural experiments e.g.
 hypothesis, treatment and control, etc.

use basic concepts in agricultural experiments.

- b. Interpretation of results, e.g. measures of central tendency and experimental errors.
- i. draw inferences from experimental results.
- ii. compute simple measures of central tendency.

DISCLAIMER

The above topics are where all your JAMB Agriculture questions for this year will come from but it does **NOT** say which 'topic in particular' and how many questions per topic.

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