

**P5022 Nov.**  
**WASSCE 2006**  
**AGRICULTURAL**  
**SCIENCE 2**  
 3 hours

2

Name: .....

Index Number: .....

**THE WEST AFRICAN EXAMINATIONS COUNCIL**

**West African Senior School Certificate Examination**

November 2006

AGRICULTURAL SCIENCE 2

3 hours

*Do not open this booklet until you are told to do so. While you are waiting, write your name and index number in the spaces provided at the top right-hand corner of this booklet and thereafter, read the following instructions carefully.*

*This paper consists of two parts. Answer Part I in your Objective Test answer sheet and Part II in your answer booklet. Part I will last for 1 hour after which the Objective Test answer sheet will be collected. Do not start Part II until you are told to do so. Part II will last for 2 hours.*

**PART I**  
**OBJECTIVE TEST**  
 [60 marks]

1 hour

1. Use **HB pencil** throughout.
2. If you have got a blank answer sheet, complete its top section as follows.
  - (a) In the space marked *Name*, write in capital letters your **surname** followed by your **other names**.
  - (b) In the spaces marked *Examination, Year, Subject and Paper*, write 'WASSCE', '2006 NOV', 'AGRICULTURAL SCIENCE' and '2' respectively.
  - (c) In the box marked *Index Number*, write your **index number** vertically in the spaces on the left-hand side. There are numbered spaces in line with each digit. Shade carefully the space with the same number as each digit.
  - (d) In the box marked *Paper Code*, write the digits **502213** in the spaces on the left-hand side. Shade the corresponding numbered spaces in the same way as for your index number.
  - (e) In the box marked *Sex*, shade the space marked **M** if you are male, or **F** if you are female.
3. If you have got a pre-printed answer sheet, check that the details are correctly printed, as described in 2 above. In the boxes marked *Index Number, Paper Code and Sex*, **reshade** each of the shaded spaces.
4. An example is given below. This is for a male candidate, whose name is **Chukwuma Adekunle CIROMA**, whose **Index Number** is **5251102068**, and who is offering **Agricultural Science 2**.

**THE WEST AFRICAN EXAMINATIONS COUNCIL**

**PRINT IN BLOCK LETTERS**

Name: CIROMA CHUKWUMA ADEKUNLE Examination: WASSCE Year: 2006 NOV.  
Surname Other Names

Subject: AGRICULTURAL SCIENCE Paper: 2

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SEX	
Indicate your sex by shading the space marked M (for Male) or F (for Female) in this box: M F	
<input checked="" type="checkbox"/>	<input type="checkbox"/>

- INSTRUCTIONS TO CANDIDATES**
1. Use grade **HB pencil** throughout.
  2. Answer each question by choosing one letter and shading it like this: [A] [B] [C]
  3. Erase completely any answers you wish to change.
  4. Leave extra spaces blank if the answer spaces provided are more than you need.
  5. Do not make any markings across the heavy black marks at the right-hand edge of your answer sheet.

**For Supervisors only.**  
 If candidate is absent shade this space:



Answer **all** the questions.

Each question is followed by **four** options lettered A to D. Find out the correct option for **each** question and shade **in pencil** on your answer sheet the answer space which bears the same letter as the option you have chosen. Give only **one** answer to **each** question.

An example is given below.

To which of the following crops does the term *ginning* apply?

- A. Kenaf
- B. Cocoa
- C. Groundnut
- D. Cotton

The correct answer is Cotton which is lettered D and therefore answer space D would be shaded.

[A]

[B]

[C]

[D]

Think carefully before you shade the answer spaces; erase completely any answer you wish to change.

Do **all** rough work on this question paper.

Now answer the following questions.

1. An important role of agriculture to national economy is the provision of
  - A. new and improved plant varieties.
  - B. feeder roads linking farms and urban centres.
  - C. raw materials for industries.
  - D. storage facilities for farm produce.
  
2. Which of the following statements is true about subsistence farming? It
  - A. provides surplus capital for investment.
  - B. provides enough food for the family.
  - C. encourages industrialization.
  - D. encourages farm mechanization.
  
3. What is the purpose of wildlife conservation?
  - A. Keeping animals in forests
  - B. Preventing the extinction of some wild animals
  - C. Ensuring that hunters always have some games
  - D. Preventing wild animals from destroying crops

4. Governments of West African countries can promote the production of cash crops by
- A. promoting the traditional farming methods.
  - B. offering higher prices to producers.
  - C. trimming down the number of farmers.
  - D. restricting the importation of food crops.
5. Which of the following statements is **not** a problem of communal land tenure system?
- A. Redemption of the land
  - B. Lack of permanent ownership of land
  - C. Disagreement among family members
  - D. Excessive fragmentation of land
6. Which of the following uses of land should be **given** priority in environmental protection?
- A. Recreation
  - B. Forestry
  - C. Siting industries
  - D. Road construction
7. The following factors influence the use of land for extensive sheep rearing **except**
- A. rainfall.
  - B. light intensity.
  - C. population density.
  - D. topography.
8. Which of the following factors will **not** affect availability of land for agriculture?
- A. Population density
  - B. Expansion of industries
  - C. Topography
  - D. Climate
9. Which of the following conditions will cause the **greatest** discomfort in livestock?
- A. High temperature and high humidity
  - B. Low temperature and high humidity
  - C. High temperature and high rainfall
  - D. Low temperature and low pressure

10. An important biotic factor which influences agricultural production is
- A. soil structure.
  - B. wind.
  - C. temperature.
  - D. predators.
11. In soil formation, the main factor that determines texture is
- A. vegetation.
  - B. topography.
  - C. climate.
  - D. parent rock.
12. The term *topography* refers to the
- A. altitude of a land.
  - B. type of vegetation on a land.
  - C. soil profile.
  - D. shape of a land.
13. The following are types of soil structure **except**
- A. platy.
  - B. granular.
  - C. prismatic.
  - D. gravel.
14. *Rhizobium* bacteria are important in the nitrogen cycle because they
- A. burrow into the soil and enhance percolation.
  - B. destroy the roots of legumes to release nitrogen.
  - C. fix atmospheric nitrogen in the soil.
  - D. cause root-knots in legumes.
15. The chemical component of wood ash are
- A. potassium and carbonate.
  - B. calcium and chloride.
  - C. potassium and chloride.
  - D. calcium and carbonate.



16. Which of the following statements about crop rotation is **not** true?
- A. Use of fertilizer is of paramount importance.
  - B. The land is put under continuous cultivation.
  - C. Legume is always included in the rotation.
  - D. Plants are at minimal level of pest and disease attack.
17. The growing of the same crop on the same piece of land every year is referred to as
- A. monoculture.
  - B. ley farming.
  - C. mixed farming.
  - D. inter-cropping.
18. Which source of farm power is **most** flexible and adaptable to farm operations?
- A. Animal
  - B. Wind
  - C. Human
  - D. Solar
19. A farm tool that is **not** required in the construction of a nesting box is
- A. the hammer.
  - B. the spade.
  - C. a drill.
  - D. a chisel.
20. A tractor derives its power from
- A. an internal combustion engine.
  - B. an external combustion engine.
  - C. a standby generator.
  - D. an electric motor.
21. Which of the following is **not** used for farm survey?
- A. Measuring tape
  - B. Lenses
  - C. Offset staff
  - D. Theodolite

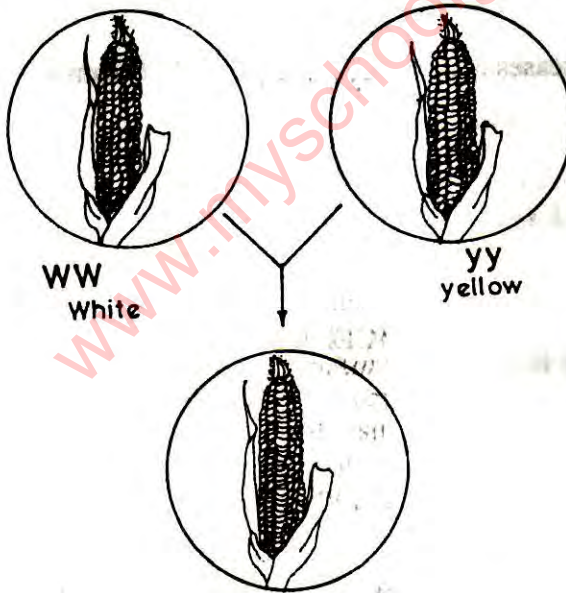
22. A farmer conducts surveying for the following reasons **except**
- A. determining the location of agricultural structures.
  - B. locating sites for drainage canals.
  - C. setting out areas of farm land.
  - D. determining the height of farmstead.
23. Which of the following groups of crops comprises only oil crops?
- A. Groundnut, jute and sunflower
  - B. Soyabean, coconut and groundnut
  - C. Sunflower, cotton and jute
  - D. Coconut, cotton and sisal hemp
24. The yield of latex from a rubber tree depends on the following factors **except**
- A. skill of tapping.
  - B. amount of bark removed at each tapping.
  - C. age of the tree.
  - D. prevailing environmental conditions.
25. The **best** time for transplanting rice seedlings is in the **morning** or evening hours because
- A. photosynthesis can only take place at these periods.
  - B. there is less heat in the mornings and evenings.
  - C. there is less moisture in the soil at those times of the day.
  - D. transpirational losses are minimal then.
26. The characteristics of a good pasture include the following **except**
- A. ability to withstand extremes of climate.
  - B. ability to produce high quality fresh leaves.
  - C. high palatability.
  - D. high stem to leave ratio.
27. Which of the following maintenance **practices** will ensure **proper** utilization of a cultivated pasture
- A. Allowing animals to graze pasture freely
  - B. Burning pasture periodically
  - C. Allowing forage crops to overgrow
  - D. Regulating grazing by animals

28. Which of the following is **not** a protective function of a forest?
- Wind break
  - Soil conservation
  - Purification of air
  - Reducing impact of raindrops
29. The growing of forest trees and arable crops on the same piece of land at the same time is termed
- ley cropping.*
  - mixed farming.*
  - afforestation.*
  - taungya system.*
30. The **most** effective way of controlling *fusarium wilt* disease in tomatoes is by
- fumigating the soil.
  - removing weeds.
  - spraying plants with insecticides.
  - rouging affected plants.
31. Which of the following plant diseases is correctly matched with its causal organism?
- Damping off-bacteria
  - Rosette-virus
  - Swollen shoot-fungus
  - Leaf mosaic-fungus
32. The **red-rot** disease of sugar cane is caused by
- virus.
  - aphid.
  - fungus.
  - protozoon.
33. Which of the following insect-pests has piercing and sucking mouthparts?
- Cotton stainer
  - Caterpillar
  - Beetle
  - Grasshopper



34. The disease control practice that relies on the introduction of parasites and predators is
- cultural.
  - chemical.
  - biological.
  - host resistance.
35. The term *instar* refers to a developmental stage of a/an
- fish.
  - insect.
  - plant.
  - rabbit.
36. The major field pests of rice are
- birds.
  - army worms.
  - rodents.
  - grasshoppers.

Study the diagrams below and use them to answer questions 37 to 39.



37. From the cross between a white maize and a yellow maize, a white maize was produced, this indicates that the gene for white colour is
- heterozygous.
  - recessive.
  - dominant.
  - homozygous.



38. The genotype of the maize plant resulting from the cross is
- A. Wwy.
  - B. ww.
  - C. Wy.
  - D. yy.
39. The gametes from the parent white maize plant are
- A. W and W.
  - B. y and y.
  - C. W and y.
  - D. y and W.
40. The length of the oestrous cycle in sow is
- A. 7 days.
  - B. 14 days.
  - C. 21 days.
  - D. 28 days.
41. When the vulva of a farm animal is observed to be red and swollen with mucous discharge, it should be
- A. introduced to a mature male animal.
  - B. treated for sexually transmitted disease.
  - C. treated for mastitis.
  - D. slaughtered and buried.
42. Progesterone is otherwise called
- A. pregnancy hormone.
  - B. placental hormone.
  - C. oestrus hormone.
  - D. follicle stimulating hormone.
43. A cattle breed with huge and bulbous horns found around Lake Chad is the
- A. Bororo.
  - B. Bornu Red.
  - C. White Fulani.
  - D. Kuri.

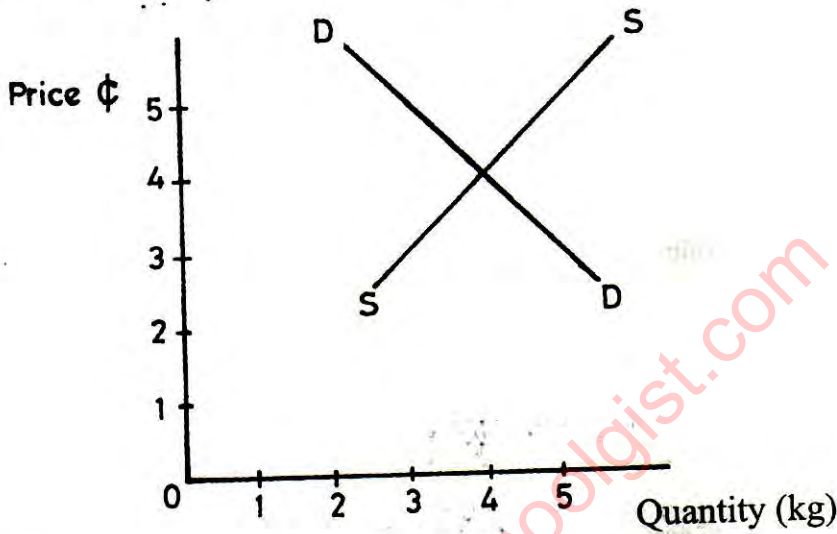
44. Which of the following is **not** a breed of rabbit?
- A. New Zealand white
  - B. California white
  - C. *N'dama*
  - D. *Chinchilla*
45. Which of the following farm animals is **not** a castrate?
- A. Bullock
  - B. Wether
  - C. Hog
  - D. Buck
46. Ruminants should be fed hay ration before turning them onto lush pasture to prevent
- A. ricket.
  - B. bloat.
  - C. red-water disease.
  - D. pleuropneumonia.
47. The two blind sacs at the junction of the small and large intestines of birds is/are known as
- A. caeca.
  - B. colon.
  - C. jejunum.
  - D. cloaca.
48. The process by which grasses are cut, fermented and later fed to livestock is termed
- A. *composting*.
  - B. *hay-making*.
  - C. *ensiling*.
  - D. *green manuring*.
49. The number of animals that can be conveniently fed on a hectare of pasture in a given time is known as
- A. carrying capacity.
  - B. stocking density.
  - C. herd size.
  - D. stock distribution.



50. Which of the following insects is a vector of *Trypanosomiasis*?
- A. Housefly
  - B. Mosquito
  - C. Tsetsefly
  - D. Blackfly
51. Which of the following livestock parasites possesses proglottides?
- A. Roundworm
  - B. Tick
  - C. Tapeworm
  - D. Liver fluke
52. The term *Fingerling* refers to a young
- A. rabbit.
  - B. duck.
  - C. fish.
  - D. goat.
53. The practice of mating a sire to its female offspring is known as
- A. *inbreeding*.
  - B. *cross breeding*.
  - C. *line-breeding*.
  - D. *out-breeding*.
54. Cross breeding in livestock results in the following effects **except**
- A. **suppression** of recessive genes.
  - B. **production** of hybrid vigour in offspring.
  - C. **higher yield** in offspring than the parents.
  - D. **complete removal** of recessive genes from a herd.
55. In a farm enterprise, which of the following is a fixed capital?
- A. Drums of insecticide
  - B. Labour force on the farm
  - C. Money for running the farm
  - D. Combine harvester

56. In agricultural production, the law of diminishing returns sets in when
- an increase in the variable factor leads to a decrease in the marginal returns.
  - an increase in the variable factor leads to an increase in the marginal returns.
  - the total product increases as more variable factor is added.
  - there is no change in the farmer's revenue.

57. From the diagram below, determine the equilibrium price



- ¢1.00
  - ¢2.00
  - ¢3.00
  - ¢4.00
58. Determine the equilibrium quantity of the produce from the diagram above in question 57
- 4.00 kg.
  - 3.00 kg.
  - 2.00 kg.
  - 1.00 kg.
59. The flow of farm produce from farmers to consumers can be referred to as
- financing.
  - marketing.
  - extension.
  - promotion.



60. The best method of introducing a new herbicide to rural farmers is through
- A. mass media.
  - B. farmers' cooperatives.
  - C. demonstration.
  - D. circular letters.

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**YOU WILL BE PENALIZED SEVERELY IF YOU ARE  
FOUND LOOKING AT THE NEXT PAGE BEFORE  
YOU ARE TOLD TO DO SO.**

## PART II

2 hours

## ESSAY

[ 80 marks ]

There are **five** sections in this part. Answer **one** question only from **each** section.

Write your answers in **ink**, in your answer booklet.

All questions carry equal marks.

## SECTION A

Answer **one** question from this section.

1. (a) List **six** agro-based industries in your country and state the raw materials used in **each** industry. [ 6 marks ]
- (b) (i) Discuss **five** problems normally experienced in the supply of raw materials to agro-based industries. [ 5 marks ]  
(ii) Suggest **five** possible ways of solving the problems. [ 5 marks ]
2. (a) State **two** functions of **each** of the following implements:  
(i) sprayers;  
(ii) harrows;  
(iii) ploughs. [ 6 marks ]
- (b) Outline **six** ways by which tractor-coupled implement may be maintained. [ 6 marks ]
- (c) State **four** precautions to take when using a knapsack sprayer. [ 4 marks ]

## SECTION B

Answer **one** question from this section.

3. (a) Define  
(i) soil structure;  
(ii) soil profile;  
(iii) soil pH. [ 6 marks ]
- (b) Discuss **five** ways in which soil structure influences crop production. [ 5 marks ]
- (c) State **five** reasons for studying soil profile. [ 5 marks ]
4. (a) Describe **each** of the following methods of irrigation:  
(i) sprinkler; [ 2 marks ]  
(ii) furrow; [ 2 marks ]  
(iii) drip. [ 2 marks ]
- (b) List **five** factors to consider when choosing an irrigation system. [ 5 marks ]
- (c) State **five** problems associated with irrigation practices. [ 5 marks ]

## SECTION C

Answer **one** question from this section.

5. (a) Explain the following terms as used in crop production:  
(i) seed rate; [ 1 mark ]  
(ii) plant density. [ 1 mark ]
- (b) List **five** factors that determine the spacing of crops in the field. [ 5 marks ]



- (c) If the number of yam setts required to plant 0.04 hectare is 215 and the weight of each yam sett is 0.80 kg. What is the seed rate per hectare in tonnes? [ 7 marks ]
- (d) Name **one** pest and **one** disease of yam. [ 2 marks ]
6. (a) List **three** advantages **each** of asexual and sexual methods of propagation. [ 6 marks ]
- (b) Describe the steps involved in budding a *citrus* plant. [ 7 marks ]
- (c) State **three** precautions in a budding operation. [ 3 marks ]

## SECTION D

Answer **one** question from this section.

7. (a) Explain the term *malnutrition*. [ 2 marks ]
- (b) State **three** symptoms of malnutrition in farm animals. [ 3 marks ]
- (c) List **five** factors to consider in formulating rations for farm animals. [ 5 marks ]
- (d) State **two** functions of **each** of the following nutrients in farm animals:
- (i) proteins;
  - (ii) vitamins;
  - (iii) minerals.
- [ 6 marks ]
8. (a) Define the term *disease* in livestock production. [ 1 mark ]
- (b) State the causal organism, prevention and **two** control measures of each of the following livestock diseases:
- (i) *Newcastle disease*;
  - (ii) *Anthrax*;
  - (iii) *Rinderpest*.
- [ 12 marks ]
- (c) Name **three** predisposing factors of livestock diseases. [ 3 marks ]

## SECTION E

Answer **one** question from this section.

9. (a) Write short notes on the following sources of farm finance:
- (i) agricultural banks;
  - (ii) co-operative societies;
  - (iii) savings and thrift societies;
  - (iv) money lenders.
- [ 8 marks ]
- (b) If a seed planter bought by a farmer at the cost of ₦120,000.00 is to last for 3 years, calculate the
- (i) **annual** depreciation if the value is assumed to fall by  $\frac{1}{3}$  of the original cost at the beginning of each year. [ 6 marks ]
  - (ii) **salvage** value of the seed planter at the end of the third year. [ 2 marks ]
10. (a) Mention **five** agricultural development programmes in West Africa. [ 5 marks ]
- (b) State **five** general objectives of agricultural development programmes. [ 5 marks ]
- (c) Suggest **six** reasons why agricultural extension programmes are ineffective in your country. [ 6 marks ]