

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination

June 2008

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

- Use HB pencil throughout.
- If you have got a blank answer sheet, complete its top section as follows.
  - In the space marked Name, write in capital letters your surname followed by your other names.
  - In the spaces marked Examination, Year, Subject and Paper, write 'WASSCE', '2008 JUNE', 'AGRICULTURAL SCIENCE' and '2' respectively.
  - 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.
  - 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.
  - In the box marked Sex, shade the space marked M if you are male, or F if you are female.
- 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.
- An example is given below. This is for a male candidate, whose name is Chukwuma Adekunle Ciroma, whose index number is 4251102068, and who is offering Agricultural Science 2.

THE WEST AFRICAN EXAMINATIONS COUNCIL

PRINT IN BLOCK LETTERS

Name: CIROMA CHUKWUMA ADEKUNLE Examination: WASSCE Year: 2008 JUNE  
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

INSTRUCTIONS TO CANDIDATES

- Use grade HB pencil throughout.
- Answer each question by choosing one letter and shading it like this: [A] [B] [C] [D]
- Erase completely any answers you wish to change.
- Leave extra spaces blank if the answer spaces provided are more than you need.
- 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. Which of the following benefits of agriculture is of **least** importance to the peasant farmer?
  - A. Materials for shelter
  - B. Employment
  - C. Foreign exchange
  - D. Income
2. Farmers who plant improved maize would harvest
  - A. pest-infested maize grains.
  - B. a high yield of maize.
  - C. plants with long stalks.
  - D. maize cobs with scattered grains.
3. Which of the following land tenure systems allows the owner **greatest** freedom to dispose of the land as he wishes?
  - A. Communal
  - B. Free-hold
  - C. Lease-hold
  - D. Share-cropping



4. Which of the following is **not** a government agricultural programme?
  - A. Operation Feed the Nation
  - B. Agricultural Development Projects
  - C. Farm Settlement Schemes
  - D. West Africa Rice Development Agency
5. The practice of planting one type of annual crop **each** season is referred to as
  - A. monoculture.
  - B. continuous cropping.
  - C. mono-cropping.
  - D. horticulture.
6. The **most** important use of land for agricultural production is
  - A. grazing paddocks.
  - B. botanical gardens.
  - C. game reserves.
  - D. farmstead construction.
7. Which of the following biotic factors are **usually** used to control cassava mealybugs?
  - A. Parasites
  - B. Predators
  - C. Pests
  - D. Pathogens
8. The following are types of sedimentary rocks **except**
  - A. granite.
  - B. limestone.
  - C. sandstone.
  - D. dolomite.
9. A reddish coloured soil indicates the presence of
  - A. copper.
  - B. sodium.
  - C. iron.
  - D. manganese.
10. The three **most** important physical factors that influence rock weathering are
  - A. colour, particle size and hardness of rock.
  - B. particle size, hardness and degree of cementation.
  - C. hardness, degree of cementation and colour.
  - D. particle size, temperature and colour.

Turn over

11. Which of the following statements is **not** true about waterlogged soils?
  - A. Such soils are heavily leached.
  - B. Denitrifying bacteria are more active in such soils than nitrifying bacteria.
  - C. Nitrosomonas yield best in such soils.
  - D. Soil temperature is usually low.
12. Which of the following crops should be planted on a piece of land that has been repeatedly cropped with maize?
  - A. Guinea corn
  - B. Millet
  - C. Rice
  - D. Cowpea
13. Sources of nitrogen to the soil include the following **except**
  - A. lightning.
  - B. urea.
  - C. blue-green algae.
  - D. residues of burning activities.
14. Which of the following statements about bush burning is **false**?
  - A. It releases mineral nutrients bound in plant tissues.
  - B. It encourages the growth of fresh grasses.
  - C. The heat generated destroys pests.
  - D. The heat generated increases the population of soil organisms.
15. A farmer applied NPK 15: 11: 8 at planting. What is the percentage of potassium in the fertilizer?
  - A. 23.53%
  - B. 32.35%
  - C. 33.33%
  - D. 44.12%
16. The following equipment can be used for irrigation **except**
  - A. bucket.
  - B. watering can.
  - C. knapsack sprayer.
  - D. siphon tube.
17. Excessive drainage of soil water can be checked by the addition of adequate quantities of
  - A. N. P. K. 15-15-15.
  - B. sulphate of ammonia.
  - C. single superphosphate.
  - D. compost manure.

18. Considering all costs, the **cheapest** source of energy for domestic use is
- A. electricity.
  - B. sunlight.
  - C. biogas.
  - D. water.
19. The implement used for pulverising the soil is the
- A. planter.
  - B. ridger.
  - C. harrow.
  - D. plough.
20. An incubator is important in supplying
- A. heat for day-old chicks.
  - B. heat for embryo development.
  - C. light for candling eggs.
  - D. feed to chicks.
21. A farm surveying equipment made of steel and used for measuring short distances is called
- A. prismatic compass.
  - B. measuring tape.
  - C. gunter's chain.
  - D. theodolite.
22. Which of the following statements about farmstead planning is **false**?
- A. Administrative blocks should not be located close to the entrance of the farmstead.
  - B. Waste disposal unit should be located far away from the main farm area.
  - C. All buildings should be well ventilated with good lightings.
  - D. Animal pens should not be located too close to the worker's house.
23. The term *supplying* in crop production means
- A. pruning excess branches of crops.
  - B. spacing out crops during planting.
  - C. replacing ungerminated seeds on seedbeds.
  - D. adding enough fertilizer to the crops.
24. During photosynthesis, green plants convert carbon dioxide to
- A. chlorophyll.
  - B. carbohydrate.
  - C. protein.
  - D. carbonic acid.

Turn over



25. *Parboiling* in the processing of rice
- improves its digestibility.
  - increases grain mass.
  - reduces the percentage of breakage.
  - facilitates the polishing of rice.
26. The **main** reason for removing the barks of cassava tubers before processing the tuber is to
- reduce the water content.
  - improve the protein content of products.
  - improve the shelf life of products.
  - reduce the cyanide content of products.
27. *Curing* is carried out in the processing of
- cassava.
  - tobacco.
  - okro.
  - tomato.
28. Tomato plants are staked for the following reasons **except** to
- produce clean fruits.
  - reduce pest damage to fruits.
  - increase the yield.
  - improve the taste.
29. A vegetatively propagated citrus plant will produce fruits earlier than the one established from seeds because
- it would not suffer from gummosis disease.
  - insect pests do not attack it.
  - it is more advanced at the time of establishment.
  - the flowers are wind pollinated.
30. *Swollen shoot* disease of cocoa is caused by
- virus.
  - fungus.
  - bacteria.
  - nematode.
31. Groundnut grows best on a
- well-drained, light sandy-loam soil.
  - well-drained, clayey friable soil.
  - swampy, sandy-clay soil.
  - well-drained, clayey-loam soil.

32. Which of the following characteristics is **not true** of a good pasture crop?
- High palatability
  - High nutritive value
  - Resistance to trampling
  - Poor digestibility
33. The benefits of establishing forests **do not** include
- derivation of medicine.
  - provision of food.
  - improvement of micro-climate.
  - shading of crops.
34. Floriculture is a subdivision of horticulture which deals with the cultivation of
- fruit crops.
  - vegetables.
  - ornamental plants.
  - spices.
35. Which of the following insect pests causes defoliation in crops?
- Mirid
  - Grasshopper
  - Weevil
  - Aphid
36. Which of the following pesticides effectively control maize stem borers?
- Systemic insecticides
  - Contact poisons
  - Nematicides
  - Fumigants
37. Which of the following combinations of practices **best** controls groundnut *rosette* disease?
- Late planting and spraying of insecticide
  - Early planting and spraying of nematicide
  - Late planting and spraying of fungicide
  - Early planting and spraying of insecticide
38. Determine the number of bottles of a herbicide required to spray 25 hectares of farmland, if one bottle is needed to prepare 100 litres and the diluted product is applied at a rate of 20 litres per hectare.
- 2 bottles
  - 5 bottles
  - 8 bottles
  - 11 bottles

Turn over

39. The milk secreting organ in cattle is the
- dewlap.
  - udder.
  - comb.
  - muzzle.
40. A developing embryo derives its nutrition from the mother
- through the blood vessels located in the placenta.
  - by sucking the mammary glands.
  - by direct diffusion through the blood vessels in the liver.
  - through the blood vessels located in the intestine of the mother.
41. Birds store their food in the
- crop.
  - gizzard.
  - proventriculus.
  - cloaca.
42. The following are examples of natural mating methods **except**
- pen mating.
  - flock mating.
  - hand mating.
  - block mating.
43. The milk collection vessel of the mammary gland is the
- alveolus.
  - gland cistern.
  - teat.
  - streak canal.
44. Fertile eggs will be produced by breeders if the
- laying units are well illuminated.
  - cocks are always kept with the hens.
  - hens are not allowed to brood.
  - eggs collected are kept at the correct temperature.
45. The rabbit is able to utilize forages because
- it has an enlarged caecum that digests fibre.
  - the small intestine is rich in microbes.
  - the mouth has large molars for grinding.
  - the length of the gut is relatively short.



46. If feed efficiency for egg production is defined as feed consumed per 10 eggs, what will be the feed efficiency for a layer that laid 230 eggs and consumed 26 kg feed?
- A. 0.88
  - B. 1.13
  - C. 1.76
  - D. 2.23
47. When birds are fed on a ration deficient in riboflavin, which of the following symptoms will they show?
- A. Night blindness
  - B. Cataract
  - C. Curled-toe paralysis
  - D. Scurvy
48. Livestock are said to feed on the range when they eat
- A. fresh herbage at the milking parlour.
  - B. fresh herbage directly from the pasture.
  - C. harvested herbage in a stall.
  - D. preserved herbage in the form of silage.
49. Which of the following practices is **not** a method of improving rangeland?
- A. Rotational grazing
  - B. Reseeding of depleted forage species
  - C. Removal of weeds
  - D. Use of inorganic fertilizers
50. Liverfluke infestation causes disturbance in lipid digestion because it
- A. blocks the passage of fat to intestine.
  - B. blocks the bile duct and reduces secretion of bile.
  - C. destroys the lipase enzyme.
  - D. prevents fat excretion.
51. A farmer noticed that one of his cows has high fever, blood-stained diarrhoea and often grinds its teeth. This shows that the cow is infected by
- A. rinderpest.
  - B. anthrax.
  - C. brucellosis.
  - D. aspergillosis.

52. Temperature is an important factor in fish ponds because it
- affects the metabolic processes in fish.
  - determines the sex of fishes.
  - encourages the growth of phytoplanktons.
  - affects the type of species of fish.
53. An illegal method of harvesting fish is by the use of
- drag net.
  - potassium cyanide.
  - hook and line.
  - calcium carbonate.
54. How can the offspring of a bull continue to be produced long after its death? By
- using the preserved semen for artificial insemination
  - collecting the semen of the offspring for use in artificial insemination
  - crossing the male and female offspring
  - preserving the body of the dead animal
55. Which of the following factors of production has profit as its reward?
- Land
  - Labour
  - Capital
  - Management
56. A farm business makes profit when
- total revenue equals total cost.
  - total cost exceeds total revenue.
  - total revenue exceeds total cost.
  - average cost equals total revenue.
57. Agricultural business is difficult to insure in West Africa mainly because
- agricultural production is not very profitable.
  - agricultural production is highly risky.
  - many farmers are very poor.
  - the premium is high.

58. A tractor with an expected life of 10 years was bought for Le 15.0m at the end of which it was to be sold for Le 1.0m. Its calculated depreciation is
- A. Le 1.4m.
  - B. Le 1.5m.
  - C. Le 1.6m.
  - D. Le 1.7m.
59. The aims and objectives of agricultural extension education **do not** include
- A. educating farmers on the use of new tools.
  - B. educating farmers on governments' annual budgets.
  - C. encouraging farmers to obtain loans for farming.
  - D. encouraging farmers to use meteorological information in farming.
60. The process which a farmer goes through from the time he hears about a new idea till he finally accepts it, is referred to as
- A. evolution.
  - B. revolution.
  - C. diffusion.
  - D. adoption.

**DO NOT TURN OVER THIS PAGE  
UNTIL YOU ARE TOLD TO DO SO.**

**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 only from this section.

1. (a) (i) Define *agriculture*. [ 2 marks ]  
 (ii) List **six** branches of agriculture. [ 3 marks ]
- (b) State **five** differences between commercial agriculture and subsistence agriculture. [ 5 marks ]
- (c) State **three** merits and **three** demerits of using animal power on the farm. [ 6 marks ]
2. (a) (i) Explain the term *farm surveying*. [ 2 marks ]  
 (ii) State **four** reasons why farm surveying is important. [ 4 marks ]
- (b) Enumerate **six** problems facing agricultural development in West Africa. [ 6 marks ]
- (c) List **four** factors that may affect the efficiency of draught animals. [ 4 marks ]

## SECTION B

Answer **one** question only from this section.

3. (a) Define the term *soil*. [ 2 marks ]
- (b) (i) List the **four** components of soil. [ 2 marks ]  
 (ii) State the percentage of **each** component by volume. [ 2 marks ]
- (c) Describe the process involved in making compost using the pit method under the following headings:
  - (i) materials; [ 2 marks ]
  - (ii) preparation; [ 6 marks ]
  - (iii) storage. [ 2 marks ]

4. (a) Define *soil erosion*. [ 2 marks ]
- (b) List **four** factors that influence nutrient availability in the soil. [ 4 marks ]
- (c) Explain **two** roles of **each** of the following factors in soil formation:
- (i) climate;
  - (ii) living organisms;
  - (iii) topography. [ 6 marks ]
- (d) State **four** problems associated with overhead irrigation. [ 4 marks ]

## SECTION C

*Answer one question only from this section.*

5. (a) (i) Define *crop rotation*. [ 2 marks ]
- (ii) Design a four-year crop rotation system using yam, cassava, maize and groundnut. [ 8 marks ]
- (b) State **four** reasons why weeds are difficult to control. [ 4 marks ]
- (c) Mention **two** effects of diseases on crop production. [ 2 marks ]
6. (a) Define *crop improvement*. [ 2 marks ]
- (b) Copy and complete the table below based on Mendel's Law of Independent Assortment of Genes (Dihybrid inheritance).

	TC	Tc	tC	tc
TC	TTCC			
Tc		TTcc		
tC				ttCc
tc			ttcC	

Use the following information:

**T** = Tall;  
**C** = Coloured;  
**t** = Dwarf;  
**c** = White.

(Where **T** and **C** are dominant characters; while **t** and **c** are recessive characters) [ 6 marks ]

Turn over

(c) Calculate the percentage of plants in 6(b) above that are:

- (i) Tall coloured;
- (ii) Tall white;
- (iii) Dwarf coloured;
- (iv) Dwarf white.

[ 8 marks ]

### SECTION D

Answer one question only from this section.

7. (a) Name **four** breeds of rabbits.

[ 2 marks ]

(b) Give **two** reasons why *oestrus* detection is important in farm animals.

[ 2 marks ]

(c) State **four** functions of **each** of the following hormones in farm animals:

- (i) androgen;
- (ii) oestrogen.

[ 8 marks ]

(d) (i) List **two** viral diseases of poultry.

(ii) List **two** ecto-parasites of poultry.

[ 4 marks ]

8. (a) List **four** methods of identification in cattle production.

[ 4 marks ]

(b) State **three** reasons for carrying out **each** of the following animal husbandry practices;

- (i) culling of poultry;
- (ii) dehorning of cattle.

[ 6 marks ]

(c) Mention the botanical names of **four** pasture legumes grown in West Africa.

[ 4 marks ]

(d) State **four** ways of preserving harvested fish.

[ 2 marks ]

### SECTION E

Answer one question only from this section.

9. (a) Define:

- (i) demand;
- (ii) price elasticity of demand.

[ 4 marks ]

(b) Explain why the demand curve slopes downwards.

[ 2 marks ]

(c) List **four** agents of agricultural marketing.

[ 4 marks ]



(d) State **two** advantages and **one** disadvantage of **each** of the following agricultural extension teaching methods:

(i) newspapers;

(ii) television.

[ 6 marks ]

10. (a) List **four** factors that cause a change in supply of agricultural produce.

[ 4 marks ]

(b) Distinguish between *fixed cost* and *variable cost* giving **two** examples in **each** case.

[ 6 marks ]

(c) Explain the following agricultural extension teaching methods:

(i) posters;

(ii) field trips.

[ 6 marks ]

EXAMINATION