

P5022 Nov.
WASSCE 2011
AGRICULTURAL
SCIENCE 2
3 hours

2

Name:

Index Number:

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination

November 2011

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', '2011 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: 2011 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: <input type="checkbox"/> M <input type="checkbox"/> F

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. The most important factor that determines the rate of agricultural development in a country is the
 - A. readiness of farmers to adopt agricultural research results.
 - B. quantity of herbicides used in the country.
 - C. number of machinery available in the country.
 - D. provision of raw materials for industries.

2. Which of the following industries does **not** use an agricultural raw material for its production?
 - A. Textile
 - B. Cement
 - C. Confectionery
 - D. Soap

3. Peasant farmers sell their agricultural produce immediately after harvesting because
 - A. stored produce would be lost to pests.
 - B. storage facilities are inadequate.
 - C. stored produce lose their quality.
 - D. the produce are perishable.

4. Subsistence agriculture involves the use of

- A. agro-chemicals.
- B. crude farm tools.
- C. farm machinery.
- D. fertilizers.

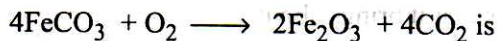
5. Land use is influenced by the following **except**

- A. fallowing.
- B. population growth.
- C. climatic conditions.
- D. topography.

6. Harmattan wind accelerates

- A. crop growth.
- B. drying of grains.
- C. decomposition.
- D. photosynthesis.

7. The chemical weathering of rocks represented by the equation below



- A. solution.
- B. hydrolysis.
- C. hydration.
- D. oxidation.

8. Which of the following rocks is formed from shale?

- A. Gneiss
- B. Limestone
- C. Slate
- D. Dolomite

9. The following factors affect rock weathering **except**

- A. water.
- B. carbonation.
- C. temperature.
- D. ammonification.

10. Wind erosion can be controlled by
- ridging across the slope.
 - practising contour farming.
 - planting trees across wind direction.
 - ridging along the direction of wind.
11. A soil is said to be acidic if the pH is
- 6.0 – 6.5.
 - 7.0 – 7.5.
 - 8.0 – 8.5.
 - 9.0 – 9.5.
12. One major element in agricultural lime is
- iron.
 - phosphorus.
 - calcium.
 - sodium.
13. The most important effect of rain on soil nutrients is that it brings about
- leaching.
 - evaporation.
 - transpiration.
 - drainage.
14. The nutrients lost from the soil can be replenished by the following practices **except**
- cover cropping.
 - continuous cropping.
 - crop rotation.
 - liming.
15. In green manuring, the *mucuna* plant is used because it
- releases nitrogen to the soil.
 - controls leaching of nutrients.
 - checks percolation of water.
 - reduces run-off speed.

16. A soil sample containing 60% sand, 20% silt and 10% clay particles can be described as
- sandy loam.
 - silty loam.
 - clayey loam.
 - silty clay.
17. The **most** efficient irrigation practice on large scale farms in West Africa is
- overhead irrigation.
 - basin irrigation.
 - underground irrigation.
 - shadoof irrigation.
18. Solar energy assists in checking pests multiplication by
- suffocation.
 - dehydration.
 - decomposition.
 - hydration.
19. Which of the following tools is **not** used in tillage operation?
- Hoe
 - Mattock
 - Pick-axe
 - Mallet
20. An incubator is used for
- candling eggs.
 - brooding chicks.
 - hatching fertile eggs.
 - storing eggs.
21. Which of the following statements about produce storage is **false**?
- Aeration is necessary for stored produce
 - High temperature and high moisture content predispose grains to spoilage
 - The storage life of seeds varies with the species and the environment
 - High moisture content is crucial for prolonged storage

22. Which of the following sources of farm power is the **least** utilized in West Africa?
- Human
 - Animal
 - Electricity
 - Biogas
23. Large-scale storage of grains is **best** done in
- barns.
 - cold rooms.
 - cribs.
 - silos.
24. One of the planting materials used in propagating yam is
- rhizome.
 - sett.
 - crown.
 - sucker.
25. A farmer who has no funds to purchase fertilizer and manure to enrich his farmland is advised to practice
- mixed cropping.
 - monoculture.
 - crop rotation.
 - silviculture.
26. *Elaeis guineensis* grows **best** in an area with annual rainfall of about
- 760 mm – 800 mm.
 - 2,000 mm – 3,000 mm.
 - 3,500 mm – 4,000 mm.
 - 4,500 mm – 5,000 mm.
27. A crop with parallel leaf venation that completes its life cycle in three months is
- a perennial dicotyledonous plant.
 - a perennial monocotyledonous plant.
 - an annual monocotyledonous plant.
 - an annual dicotyledonous plant.

28. Which of the following crops is a forage legume?

- A. Elephant grass
- B. Mucuna
- C. Spear grass
- D. Northern gamba grass

29. *Parboiling* of rice involves

- A. soaking for short time and drying.
- B. boiling for long time and drying.
- C. boiling for short time and drying.
- D. soaking for long time and drying.

The information provided below is about soil and climatic requirements for the production of crop X in a particular area. Use it to answer questions 30 and 31.

Water requirement of crop – 2,000 mm/year

Tolerance to waterlogged condition – Poor

Rainfall in the area – 800 mm/year

Relative humidity of the area – 48%

Average diurnal temperature of the area – 37 °C

30. Which of the following cultural practices would be considered suitable for the successful growth of the crop?

- A. Mulching
- B. Irrigation
- C. Ridging
- D. Manuring

31. Assuming moisture supply and nutrients are adequate, the growth of crop X in the area would likely be

- A. normal.
- B. slow.
- C. fast.
- D. retarded.

32. The main objective of growing ornamental plants is to

- A. provide income for florists.
- B. beautify the environment.
- C. provide medicinal herbs.
- D. control soil erosion.

33. Viral diseases of crops can **best** be managed through
- vector control.
 - planting resistant varieties.
 - carrying out cultural practices.
 - sterilizing farm equipment.
34. *Tikka* is a fungal disease of
- groundnut.
 - plantain.
 - cowpea.
 - citrus.
35. *Root knot* disease of tomato can be controlled by applying
- insecticides.
 - nematicides.
 - avicides.
 - herbicides.
36. Bean beetles cause the following damages **except**
- reduction in market value.
 - spoilage of quality of grains.
 - reduction in germination ability.
 - discolouration of testa.
37. A systemic herbicide is **best** for the control of
- annual weeds.
 - perennial weeds.
 - monocotyledonous weeds.
 - dicotyledonous weeds.
38. The hereditary units of inheritance that are responsible for the transmission of characters from parents their offspring are the
- chromosomes.
 - genes.
 - ovules.
 - zygotes.
39. In the alimentary canal of poultry, grit could be found in the
- caecum.
 - gizzard.
 - intestine.
 - proventriculus.

40. Lactation in farm animals is **positively** affected by
- frightening and irritating the animals.
 - subjecting the animals to pain or noise.
 - regular extraction of milk from their udders.
 - starving the animals of food and water.
41. Good management practices in pastures include the following **except**
- continuous grazing.
 - rotational grazing.
 - control of weeds.
 - use of fertilizers.
42. Which of the following diseases is caused by a bacterium?
- Foot and mouth disease
 - Rinderpest
 - Brucellosis
 - Newcastle disease
43. Which of the following statements is **false** about the **oestrus cycle**? It is
- the end of one heat period to the beginning of another.
 - regulated by a hormone called oestrogen.
 - different from one animal species to another.
 - controlled by a hormone called progesterone.
44. Needle teeth in piglets are removed to
- prevent wounding of sow's teats.
 - prevent piglets from biting one another.
 - make piglets grow faster.
 - facilitate suckling by piglets.
45. In the domestic fowl, a cock could be differentiated from a hen by its possession of
- small combs.
 - prominent spurs.
 - dull feathers.
 - thin shanks.
46. The system of keeping a goat tied to a pole for grazing is known as
- paddocking.
 - tethering.
 - ranching.
 - browsing.

47. The process of mating in sheep is termed
- treading.
 - courting.
 - tupping.
 - servicing.
48. One of the disadvantages of poultry production is that
- return per unit space is high.
 - there are early returns on capital.
 - eggs have quick turn over.
 - capital outlay is high.
49. In animal nutrition, iodine is essential for the production of
- oxygen.
 - thyroxine.
 - insulin.
 - progesterone.
50. In poultry nutrition, the minerals that prevent the laying of thin-shelled eggs are
- calcium and phosphorus.
 - sodium and calcium.
 - phosphorus and sodium.
 - sulphur and phosphorus.
51. Methods of rangeland improvement do **not** include
- controlled grazing.
 - stocking rate.
 - burning.
 - paddock.
52. The *pox* diseases in livestock are caused by
- bacteria.
 - viruses.
 - protozoa.
 - fungi.
53. Fertilizers are applied to fishponds to serve as
- bait for fish.
 - food for fish.
 - nutrients for plankton.
 - water purifier.

54. Which of the following statements about fish smoking is **false**?
- A. Smoking increases the protein content of fish.
 - B. During smoking the heat cooks the fish.
 - C. The smoke gives the fish a special aroma.
 - D. Smoke kills some of the bacteria present.
55. The **most** effective breeding system for preventing sexually transmitted diseases in farm animals is by
- A. artificial insemination.
 - B. hand mating.
 - C. crossbreeding.
 - D. inbreeding.
56. Determine the weight gained by a lamb within a normal year if its birth weight was 2.800 kg and it gained 53 g per day on the average.
- A. 14.840 kg.
 - B. 16.545 kg.
 - C. 19.345 kg.
 - D. 22.145 kg.
57. Artificial scarcity of agricultural produce is often caused by the following marketing agents **except**
- A. wholesalers.
 - B. middlemen.
 - C. farmers.
 - D. co-operatives.
58. In West Africa, farm labour is on the decline because of
- A. increase in urban-rural migration.
 - B. increase in rural-urban drift.
 - C. increase in cost of hiring labour.
 - D. decrease in white collar jobs.
59. Which of the following statements is **not true** of cooperative societies?
- A. Members cooperate to protect their interest
 - B. They promote thrift and crediting
 - C. Their operation cost is low
 - D. Membership is restricted to the literate farmers
60. The **best** method for the effective teaching of agriculture in schools is by
- A. instructions and on-farm practical.
 - B. instructions and field trips.
 - C. instructions only.
 - D. laboratory instructions.

**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

ESSAY

[80 marks]

2 hours

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) Define the term *land tenure system*. [2 marks]
 - (b) State **two** advantages of **each** of the following land tenure systems:
 - (i) *leasehold*;
 - (ii) *freehold*. [4 marks]
 - (c) State **two** reasons why a disc plough is preferred to a mouldboard plough for land preparation in West Africa. [2 marks]
 - (d) (i) Name **four** parts of a disc plough. [4 marks]
 - (ii) State **one** function of **each** of the parts named in 1(d)(i). [4 marks]
2. (a) State **five** ways by which agriculture has contributed to the national economy of your country. [5 marks]
 - (b) Write the full meaning of the following acronyms of non-governmental agricultural organisations:
 - (i) WARDA;
 - (ii) IITA. [2 marks]
 - (c) State **three** functions of **each** of the following farm machinery:
 - (i) *bulldozer*;
 - (ii) *mistblower*;
 - (iii) *harrow*. [9 marks]

SECTION B

Answer **one** question from this section.

3. (a) (i) Distinguish between *straight fertilizers* and *compound fertilizers*. [2 marks]
 (ii) Give **four** examples of inorganic fertilizers. [4 marks]
- (b) List **three** biotic and **three** climatic factors that influence agricultural production in West Africa. [6 marks]
- (c) State **four** ways by which the carbon cycle is important in agriculture. [4 marks]
4. (a) Explain the term *soil*. [2 marks]
- (b) List **four** characteristics of loamy soil. [4 marks]
- (c) (i) Draw an annotated diagram of the water cycle. [7 marks]
 (ii) List the **three** types of soil water. [3 marks]

SECTION C

Answer **one** question from this section.

5. (a) Give **two** examples each of crops that belong to the following crop groupings:
- (i) *fibres*;
 (ii) *vegetables*;
 (iii) *tubers*;
 (iv) *oil crops*;
 (v) *legumes*;
 (vi) *cereals*;
 (vii) *tree fruits*;
 (viii) *beverages*. [8 marks]
- (b) A vegetable crop is planted at a spacing of 40 cm × 40 cm on an 80 m × 40 m farmland. Calculate the expected plant population. [4 marks]
- (c) State **four** factors that should be considered in planning crop production. [4 marks]

6. (a) Explain **each** of the following terms as used in crop production:
- grafting*; [6 marks]
 - thinning*; [6 marks]
 - staking*. [6 marks]
- (b) State **two** reasons for adopting **each** of the crop production activities listed in 6(a). [6 marks]
- (c) Mention the botanical names of **two** species of yam. [2 marks]
- (d) State **two** uses of ginger. [2 marks]

SECTION D

Answer **one** question from this section.

7. (a) (i) Explain the terms *line breeding* and *inbreeding* as used in animal improvement. [4 marks]
- (ii) State **three** advantages and **three** disadvantages of inbreeding. [6 marks]
- (b) State **four** factors that determine the amount of water required by farm animals. [4 marks]
- (c) Give **four** sources of calcium in the diet of livestock. [2 marks]
8. (a) State **three** characteristics of **each** of the following classes of animal feedstuffs:
- roughage*;
 - basal feeds*;
 - concentrates*. [9 marks]
- (b) Enumerate **four** factors that should be considered in selecting a site for the construction of a fish pond. [4 marks]
- (c) State **three** preventive and control measures of diseases in farm animals. [3 marks]

SECTION E

Answer one question from this section.

9. (a) Describe **each** of the following farm records:
- (i) *farm diary*;
 - (ii) *farm inventory*;
 - (iii) *balance sheet*. [9 marks]
- (b) Outline **three** factors that can affect the price of rice. [3 marks]
- (c) Explain the following agricultural extension teaching methods:
- (i) *print media*;
 - (ii) *film shows*. [4 marks]
10. (a) Explain the following terms as used in agricultural production:
- (i) *hired labour*;
 - (ii) *fixed capital*;
 - (iii) *management*. [9 marks]
- (b) Give **three** reasons why the prices of **most** agricultural produce are unstable in West Africa. [3 marks]
- (c) Describe the following agricultural extension teaching methods:
- (i) *field day*;
 - (ii) *agricultural shows*. [4 marks]