May/June WASSCE (WAEC) Integrated Science Past Questions (Paper 1, 2012) - Source:www.Larnedu.com

S5171 WASSCE
May/June 2012
INTEGRATED
SCIENCE 1
2½ hours

1

Name.....

Index Number.....

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination

May/June 2012 INTEGRATED SCIENCE 1 2½ hours

Do **not** *open this booklet until you are told to do so. While you are waiting, read and observe the following instructions carefully. Write your* **name** *and* **index number** *in the spaces provided above.*

This paper consists of two sections, A and B. Answer Section A on your objective test answer sheet and Section B in your answer booklet. Section A will last 1 hour after which the answer sheet will be collected. Do **not** *start Section B until you are told to do so. Section B will last* 1½ hours.

SECTION A 1 hour
OBJECTIVE TEST
[50 marks]

1. Use 2B pencil throughout.
2. On the pre-printed answer sheet, check that the following details are **correctly** printed:
   (*a*) In the space marked *Name*, check your **surname** followed by your **other names**.
   (*b*) In the spaces marked *Examination, Year, Subject* and *Paper*, check 'WASSCE May/June', '2012', 'INTEGRATED SCIENCE', and '1' in that order.
   (*c*) In the box marked *Index Number,* your **index number** has been printed vertically in the spaces on the left-hand side, and each numbered space has been shaded in line with each digit. **Reshade** each of the shaded spaces.
   (*d*) In the box marked *Subject Code*, the digits 517113 are printed vertically in the spaces on the left-hand side. **Reshade** the corresponding numbered spaces as you did for your index number.
3. An example is given below. This is for a male candidate whose *name* is Paul Abdul MIEZAH. *His index number* is 7102143958 and he is offering *Integrated Science* 1

THE WEST AFRICAN EXAMINATIONS COUNCIL

PRINTED IN BLOCK LETTERS
Name: MIEZAH PAUL ABDUL GHA
Examination: WASSCE May/June Year: 2012
Subject: INTEGRATED SCIENCE Paper: 1

INSTRUCTIONS TO CANDIDATES
1. Use grade 2B pencil throughout.
2. Answer each question by choosing one letter and shading it like this: ⊏A⊐ ⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
3. Erase completely any answer you wish to change.
4. Leave extra spaces blank if the answer spaces provided are more than you need.

INDEX NUMBER: 7 1 0 2 1 4 3 9 5 8

SUBJECT CODE: 5 1 7 1 1 3

For Supervisors only
If candidate is absent ☐

Answer **all** *the questions.*

Each question is followed by **four** *options lettered* A *to* D. *Find 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.*

Which of the following elements is a metal?

A. Carbon
B. Copper
C. Helium
D. Krypton

The correct answer is Copper, *which is lettered* B, *and therefore answer space* B *would be shaded.*

⊏A⊐ ▬B▬ ⊏C⊐ ⊏D⊐ ⊏E⊐

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

Do all rough work on this question paper.

Now answer the following questions:

1. Interbreeding organisms are members of the same
   A. class.
   B. family.
   C. genus.
   D. species.

2. The *pH* value of a solution is **accurately** determined by using
   A. litmus paper.
   B. methyl orange.
   C. phenolphthalein.
   D. universal indicator.

3. In which part of the leaf of a flowering plant is the **greatest** amount of glucose produced during photosynthesis?
   A. Lower epidermal cells
   B. Upper epidermal cells
   C. Palisade cells
   D. Spongy mesophyll cells

4. An advantage of the use of hay over silage in animal production is that hay
   A. is available throughout the year.
   B. has a laxative effect.
   C. has higher proportion of leaves, water and nutrients.
   D. is more palatable to livestock.

5. Which of the following types of teeth is absent in herbivores?
   A. Canines
   B. Incisors
   C. Premolars
   D. Molars

6. A block and tackle system consists of three fixed and two movable pulleys. Determine the velocity ratio of the system.
   A. 2
   B. 3
   C. 5
   D. 6

7. Pulmonary circulation in mammals involves the movement of blood from the
   A. heart to the body and back.
   B. lungs to the heart and back.
   C. heart to the lungs and back.
   D. lungs to the body and back.

8. Tides occur as a result of
   A. cool air at the poles flowing towards the equator.
   B. gravitational pull of the moon on the seas.
   C. differences in temperature between the land and the sea.
   D. the revolution of the earth.

9. Identical twins look alike because they develop from
   A. one ovum fertilised by two sperms.
   B. two ova fertilised by one sperm.
   C. two ova fertilised by two sperms.
   D. one ovum fertilised by one sperm.

10. Which of the following equipment are used in poultry production?
   I. Burdizzo
   II. Debeaker
   III. Hoover
   IV. Seine net

   A. I and II only
   B. I and III only
   C. II and III only
   D. III and IV only

11. One advantage of male circumcision is to
   A. reveal the strength in an individual.
   B. confer manhood on the individual.
   C. prevent infection of the tip of the penis.
   D. enable the penis to become erect.

12. The silvered walls of a thermos flask are to reduce heat outflow and inflow by
   I. convection.
   II. conduction.
   III. radiation.

   A. I only
   B. III only
   C. I and II only
   D. II and III only

Turn over

13. Which of the following pairs of plants are rhizomes?
    A. Cocoyam and cassava
    B. Canna lily and ginger
    C. Onion and garlic
    D. Banana and plantain

14. Rabbits are housed in a
    A. hutch.
    B. kraal.
    C. pen.
    D. sty.

15. A bond formed between two atoms is considered as ionic when
    A. the two atoms share a pair of electrons.
    B. there is transfer of at least one electron from one atom to the other.
    C. both atoms transfer electrons to each other.
    D. no electron transfer occurs between the atoms.

16. The **correct** path of air entering the lungs through the nostrils of a mammal is represented as
    A. glottis → trachea → bronchi → bronchioles → lungs.
    B. trachea → glottis → bronchi → bronchioles → lungs.
    C. bronchi → trachea → glottis → bronchioles → lungs.
    D. bronchioles → bronchi → trachea → glottis → lungs.

17. Which of the following cultural practices are carried out in the cultivation of tomatoes?
    I. Pruning
    II. Shading
    III. Staking

    A. I and II only
    B. I and III only
    C. II and III only
    D. I, II and III

18. Prenatal period in human growth and development is the period from
    A. birth to adolescence.
    B. conception to birth.
    C. birth to childhood.
    D. adolescence to adulthood.

19. The mass of a body remains constant at all places because
    A. of the tendency of the body to remain at rest.
    B. mass depends solely on distance between molecules of a body.
    C. mass does not depend on acceleration due to gravity.
    D. matter can neither be created nor destroyed.

20. The taste buds in humans that are sensitive to sour taste are located at the
    A. tip of the tongue.
    B. back of the tongue.
    C. sides of the tongue.
    D. middle of the tongue.

21. Duralumin is an alloy used in the construction of aircrafts because it
    A. has a low melting point.
    B. is attractive in appearance.
    C. is very light and strong.
    D. is non-corrosive.

22. Diffusion in mammals is demonstrated in the
    A. movement of urine from the kidney into the urinary bladder.
    B. movement of saliva from the salivary glands into the buccal cavity.
    C. absorption of salts by the cells of the body.
    D. gaseous exchange in the alveoli.

23. Petroleum consists of a mixture of
    A. alkanoic acids.
    B. esters.
    C. hydrocarbons.
    D. polymers.

24. Emulsification of fats by the bile in the digestive system of a mammal signifies the
    A. destruction of fats.
    B. convection of fats to fatty acids and glycerol.
    C. breaking down of large fat globules into small droplets.
    D. prevention of enzymes from digesting fats.

25. Which of the following chemical equations represents a neutralization reaction?
    A. $CaO + H_2O \rightarrow Ca(OH)_2$
    B. $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$
    C. $Zn(OH)_2 + 2HCl \rightarrow ZnCl_2 + 2H_2O$
    D. $C_2H_2 + H_2O \rightarrow C_2H_5OH$

26. A characteristic feature of a wind-pollinated flower is the possession of
    A. brightly coloured petals.
    B. large petals.
    C. horny guider.
    D. large pendulous stamens.

27. A body of mass 2 kg floats on water. If the density of water is 1000 kg m^{-3}, determine the volume of the body.
    A. 2.0×10^{-1} m^3
    B. 2.0×10^{-2} m^3
    C. 2.0×10^{-3} m^3
    D. 2.0×10^{2} m^3

28. Which of the following functions is common to the skin and the lungs of a mammal?
    A. Conservation of energy
    B. Removal of water
    C. Reabsorption of glucose
    D. Removal of nitrogenous waste from the body

29. The **major** difference between a clayey soil and a sandy soil is in their
    A. colour.
    B. humus content.
    C. mineral content.
    D. texture.

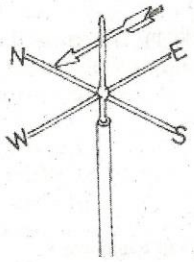
30. When a moving vehicle stops suddenly, the passengers jerk forward. This is due to the
    A. wind surrounding the vehicle.
    B. force acting on the vehicle.
    C. reaction of the passengers.
    D. ability of the passengers to continue in motion.

31. The **main** reason for growing ornamental plants is
    A. for them to serve as a fence.
    B. for their medicinal value.
    C. to provide shade.
    D. for their decorative effect.

32. The reaction between an alkanoic acid and an alkanol is known as
    A. esterification.
    B. neutralization.
    C. polymerization.
    D. saponification.

33. A microscopic organism with the nucleus enclosed in a membrane belongs to the Kingdom
    A. Animalia.
    B. Plantae.
    C. Prokaryotae.
    D. Protoctista.

34. An object is placed between the optical centre and the principal focus of a converging lens. The image formed is
    A. magnified, virtual and erect.
    B. magnified, real and inverted.
    C. diminished, real and inverted.
    D. diminished, virtual and erect.

35. 

The diagram above illustrates a/an
    A. anemometer.
    B. secchi disc.
    C. wind vane.
    D. quadrat.

36. An example of a substance that boils at 100 °C and at one atmosphere is
A. a mixture of potassium chloride and distilled water.
B. ice made from distilled water.
C. ethanol mixed with 10% water.
D. distilled water mixed with 10% alcohol.

37. Which of the following statements about the uses of radioisotopes are **correct**?
I. Preservation of food
II. Killing of bacteria in water
III. Sterilization of equipment
IV. Treatment of cancer

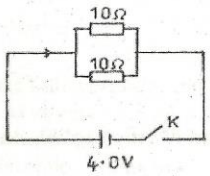
A. I and II only
B. III and IV only
C. I, II and III only
D. I, II and IV only

38. In which of the following media would sound travel **fastest**?
A. Air
B. Iron
C. Water
D. Wood

39. A homozygous black mouse is mated to a white mouse. If black is dominant to white colour, what will be the colour of the young mice?
A. All will be white.
B. All will be black.
C. Some will be black and some will be white.
D. Each of them will be partly black and partly white.

40. Which of the following energy transformations represents the changes that take place when a torchlight is switched on?
A. Chemical → heat → electrical → light
B. Chemical → heat → light → electrical
C. Chemical → electrical → heat → light
D. Electrical → chemical → heat → light

41. Fermentation of corn dough occurs as a result of the
A. action of houseflies on the dough.
B. action of microbes on the dough.
C. presence of water in the dough.
D. starch in the dough.

42. 

Determine the current through the electrical circuit above when the key is closed.
A. 0.2 A
B. 0.8 A
C. 2.5 A
D. 5.0 A

Turn over

43. Which of the following statements about a small-scale industry is **correct**? It
A. makes use of advanced technology.
B. is always sited in rural areas.
C. is always capital intensive.
D. operates with the minimum input of materials.

44. The **most** economical method of preserving fish in West Africa is
A. canning.
B. drying.
C. freezing.
D. smoking.

45. Evidence from comparative embryology in support of evolution shows that
A. embryos of different vertebrates have similar structures.
B. embryos of different vertebrates have different structures.
C. vertebrates evolved from different ancestors.
D. bodies of different vertebrates have different body plan.

46. Consider the following hazards:
I. earthquake,
II. asbestos dust,
III. flooding,
IV. forest fires.

Which of the hazards are classified as *natural hazards*?
A. I and II only
B. III and IV only
C. I, II and III only
D. I, III and IV only

47. One of the reasons for using a capacitor in an electronic circuit is to
A. amplify electronic signals.
B. cut off the current flowing from the emitter.
C. emit incoherent narrow spectrum light.
D. differentiate between high frequency and low frequency signals.

48. Which of the following statements explain why air is considered as a mixture?
I. There is no chemical formula for air.
II. The constituents of air are not in fixed proportions.
III. Air has weight and occupies volume.
IV. The constituents of air can be separated by physical means.

A. I and II only
B. III and IV only
C. I, II and III only
D. I, II and IV only

49. An electronic device which allows an electric current to flow in one direction and blocks it in an opposite direction is called
A. capacitor.
B. diode.
C. inductor.
D. transistor.

50. Isotopes of a particular element have the same
   A. atomic number.
   B. atomic mass.
   C. mass number.
   D. number of electrons.

END OF OBJECTIVE TEST

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.

SECTION B — 1½ hours

ESSAY

[80 marks]

Answer **four** *questions* **only** *from this section.*

Credit will be given for clarity of expression and orderly presentation of material.

All questions carry equal marks.

1. (*a*) (i) What are *plastics*?
(ii) State **three** uses of plastic materials?
[5 marks]

(*b*) With the aid of a diagram, describe how a piece of nail can be magnetised using a piece of bar magnet. [5 marks]

(*c*) (i) Explain the term *de-horning* as used in animal production.
(ii) State **three** ways in which de-horning is important in animal production.
[5 marks]

(*d*) (i) Name **two** organisms involved in the nitrogen cycle.
(ii) State **three** ways in which the nitrogen cycle is important to living organisms.
[5 marks]

2. (*a*) State
(i) **two** differences between *boiling* and *evaporation*,
(ii) **two** factors that affect the rate of evaporation.
[4 marks]

(*b*) State **one** reason **each** for carrying out **each** of the following management practices in a brooder house:
(i) ensuring good ventilation;
(ii) control of human traffic to the brooder house;
(iii) visit brooding chicks first before older birds;
(iv) debeaking two to three-week-old chicks;
(v) strictly following the recommended medication and vaccination schedules.
[5 marks]

(*c*) Explain the role of **each** of the following organisms in a food chain:
(i) green plants;
(ii) herbivores;
(iii) carnivores.
[6 marks]

(*d*) (i) List **two** types of dissolved substances that may be present in water.
(ii) Describe **briefly** an experiment to investigate the presence of dissolved substances in water.
[5 marks]

3. (*a*) (i) List **two** examples of worms that infest farm animals.
(ii) State **two** precautions that could be taken to reduce worm infestation in farm animals.
[4 marks]

(*b*) (i) Describe how the end-product of digestion of fats and oils is absorbed in humans.
(ii) State **two** ways in which fats and oils are important to the human body.
[6 marks]

(*c*) (i) What is a *functional group*?
(ii) Draw the structure of **each** of the following functional groups:
(α) alkynes;
(β) alkanols;
(γ) organic acids.
[5 marks]

(*d*) (i) What is *relative density*?
(ii) The density of a piece of stone is 2500 kg m^{-3}. Determine its relative density.
[*Density of water is* 1000 kg m^{-3}] [5 marks]

4. (*a*) Describe **briefly** how the skin of a mammal carries out **each** of the following functions:
(i) excretion;
(ii) protection.
[6 marks]

(*b*) Outline the steps leading to the electrolytic extraction of aluminium from its ore. [6 marks]

(*c*) (i) What is a *transformer*?
(ii) Draw and label a step-up transformer.
[4 marks]

(*d*) State **two** deficiency symptoms of **each** of the following plant nutrients:
(i) nitrogen;
(ii) phosphorus.
[4 marks]

5. (*a*) (i) What is meant by *molar mass*?
(ii) An aqueous solution of sodium hydroxide contained in a bottle is labelled 0.20 M. Determine the mass of sodium hydroxide used in preparing the solution.
[Na = 23, O = 16, H = 1] [5 marks]

(*b*) An electrical appliance rated 240 V, 1500 W is connected to an *a.c.* mains and used for 2 hours. Calculate the
(i) resistance of the appliance,
(ii) cost of running the appliance.
[5 marks]

(*c*) State **five** qualities of fertile soil. [5 marks]

(*d*) (i) List the **two** types of cell division that occur in eukaryotes.
(ii) State **three** differences between the two types of cell division you have listed in (i).
[5 marks]

6. (*a*) (i) What is a *thermostat*?
(ii) List **three** electrical appliances that make use of thermostats in their operation.
[4 marks]

(*b*) Explain **each** of the following terms as used in crop production:
(i) prickling out;
(ii) staking;
(ii) filling-in.
[6 marks]

(*c*) (i) Explain the term *phenotype* as used in genetics.
(ii) The offsprings resulting from the cross between a red-flowered plant and a white-flowered plant were all found to be red. With the aid of appropriate crosses, illustrate the observation.
[6 marls]

(*d*) (i) What is a *neutralization reaction*?
(ii) With the aid of litmus papers, demonstrate that all the reactants in a neutralization reaction have been used up.
[4 marks]

END OF PAPER