

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) Explain the term *kindling* as used in rabbit production.
(ii) Name **three** diseases of rabbits. goiter [5 marks]
- (b) (i) State the **main** difference between *potential energy* and *kinetic energy*.
(ii) A body of mass 250 g is released from the top of a building. If the body hits the ground with a velocity of 4 m s^{-1} , calculate the height of the building.
[$g = 10 \text{ m s}^{-2}$] [5 marks]
- (c) (i) Describe **briefly** how the pH of a colourless solution could be measured using a universal indicator.
(ii) State **two** precautions to be taken in the pH measurement described in (c)(i). [5 marks]
- (d) (i) Differentiate between *osmosis* and *plasmolysis*.
(ii) State **three** natural conditions under which plasmolysis could occur. [5 marks]
2. (a) A 100 cm^3 of 2.5 mol dm^{-3} hydrochloric acid is added to calcium carbonate in a test tube.
(i) Write a balanced chemical equation for the reaction that occurred.
(ii) Calculate the number of moles of hydrochloric acid used. [6 marks]
- (b) (i) What is *iodated salt*?
(ii) State **three** benefits of iodated salt to the human body. [5 marks]
- (c) (i) What is *decombing*? MN
(ii) Give **three** reasons why decombing is important. Deyak [5 marks]
- (d) (i) Name **two** discrete electronic components.
(ii) State the function of **each** of the components named in (d)(i) in an electronic circuit.
3. (a) (i) Explain **each** of the following terms as used in Ecology:
(α) competition;
(β) predation.
(ii) Give **two** examples of artificial ecosystems. Hcl + CaCO₃ [4 marks]
CaCl₂ + CO₂H [6 marks]

- (b) (i) Explain why temporary hardness in water can be removed by boiling the water.
 (ii) How would you prove that a sample of a liquid is pure water?
 [4 marks]

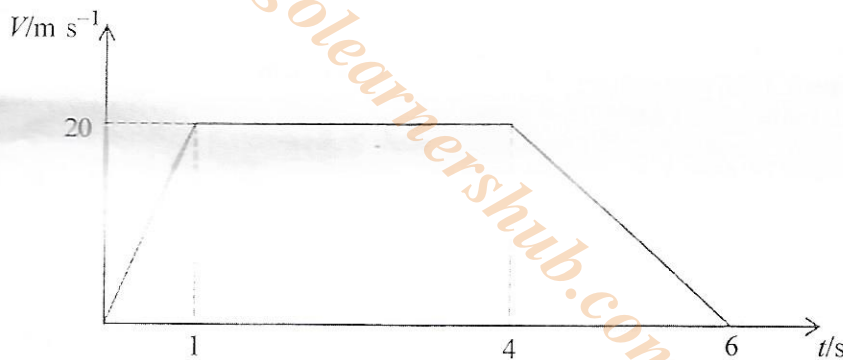
- (c) Name the layers of the atmosphere in the **correct** order from the surface of the earth.
 [5 marks]

- (d) (i) Explain how the water trough for day-old chicks operates.
 (ii) State **two** functions of the hover in the brooder house.
 [5 marks]

4. (a) (i) State **two** differences between *organic compounds* and *inorganic compounds*.
 (ii) Give **three** examples of carbon compounds which are **not** organic compounds.
 [5 marks]

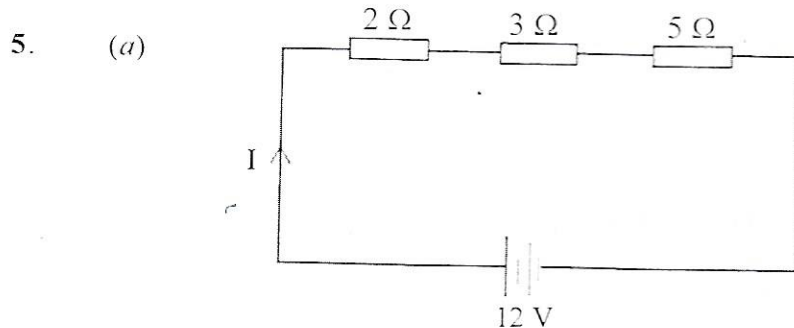
- (b) (i) What is *weathering* of rocks?
 (ii) Describe **two** ways in which living organisms cause weathering.
 [6 marks]

- (c) State **four** symptoms of disorder of the central nervous system.
 [4 marks]



- (d) The diagram above is a sketch of velocity-time graph for a body. Calculate
 (i) the acceleration of the body in the **first** minute.
 (ii) the total distance covered by the body.

[5 marks]



- The diagram above illustrates an electrical circuit. Calculate the
 (i) value of the current, I , in the circuit;
 (ii) potential difference across the $2\ \Omega$ resistor.

[5 marks]

Turn over

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**WHILE YOU ARE WAITING, READ THE FOLLOWING
INSTRUCTIONS CAREFULLY**

PAPER 1
OBJECTIVE TEST
[50 marks]

1 hour

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', 'PC 2020', '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 female candidate whose *name* is Adzo AMANOR. Her *index number* is 7102143958 and she is offering *Integrated Science 1*

THE WEST AFRICAN EXAMINATIONS COUNCIL

PRINTED IN BLOCK LETTERS	
Name: <u>AMANOR GIFTY ADZO</u>	GHA
Examination: <u>WASSCE</u>	Year: <u>PC 2020</u>
Subject: <u>INTEGRATED SCIENCE</u>	Paper: <u>1</u>

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	0 1 2 3 4 5 6 7 8 9
1	0 1 2 3 4 5 6 7 8 9
0	0 1 2 3 4 5 6 7 8 9
2	0 1 2 3 4 5 6 7 8 9
1	0 1 2 3 4 5 6 7 8 9
4	0 1 2 3 4 5 6 7 8 9
3	0 1 2 3 4 5 6 7 8 9
9	0 1 2 3 4 5 6 7 8 9
5	0 1 2 3 4 5 6 7 8 9
8	0 1 2 3 4 5 6 7 8 9

SUBJECT CODE	
5	0 1 2 3 4 5 6 7 8 9
1	0 1 2 3 4 5 6 7 8 9
7	0 1 2 3 4 5 6 7 8 9
1	0 1 2 3 4 5 6 7 8 9
1	0 1 2 3 4 5 6 7 8 9
3	0 1 2 3 4 5 6 7 8 9

For Supervisors only If candidate is absent <input style="width: 50px; height: 15px;" type="text"/>

- (b) (i) State **two** negative effects of mining on the environment.
(ii) Suggest **one** way of minimizing **each** of the negative effects stated in (d)(i). [4 marks]
- (c) (i) Explain the term *flushing* as used in animal production.
(ii) Give **three** reasons why flushing is important. [5 marks]
- (d) (i) What is *agglutination* as used in blood transfusion?
(ii) Explain **briefly** each of the following statements:
(α) a student's Blood Group is B positive;
(β) a patient's blood pressure is $\frac{118}{70}$. [6 marks]
6. (a) (i) What is *crop pest*?
(ii) State **three** ways of preventing pests from attacking crops. [5 marks]
- (b) Explain **each** of the following terms as used in Genetics:
(i) monohybrid cross;
(ii) Antigen;
(iii) filial generation. [6 marks]
- (c) (i) What is a *metal*?
(ii) Give **one** example of:
(α) a non-metal liquid ;
(β) a non-metal gas ;
(γ) a non-metal solid that conducts electricity. [5 marks]
- (d) A rectangular box of base length 60 cm, weighs 0.2 N. The box exerts a pressure of 2 Pa on a table on which it is placed. Determine the breadth of the base of the box. [4 marks]

END OF ESSAY TEST

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OBJECTIVE TEST
[50 marks]

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Name: <u>AMANOR GIFTY ADZO</u>	GHA
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INSTRUCTIONS TO CANDIDATES 1. Use grade 2B pencil throughout. 2. Answer each question by choosing one letter and shading it like this: <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> 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.
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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

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. In which of the following parts of the digestive system does peristalsis occur?
 - A. Anus
 - B. Duodenum
 - C. Mouth
 - D. Pancreas
2. Which of these rocks can be referred to as the mother rock?
 - A. Igneous rock
 - B. Metamorphic rock
 - C. Sedimentary rock
 - D. Plutonic rock
3. The structure in the human ear which is responsible for the balancing of the body is
 - A. auditory nerve.
 - B. cochlea.
 - C. Eustachian tube.
 - D. semi-circular canals.
4. One characteristic of the troposphere is the presence of
 - A. water.
 - B. carbon compounds.
 - C. nitrogen.
 - D. ozone.
5. Which of the following radiations is positively charged?
 - A. Alpha
 - B. Beta
 - C. Gamma
 - D. X-ray

6. The following sources of energy are renewable **except**
- A. alcohol.
 - B. crude oil.
 - C. firewood.
 - D. saw dust.
7. Which of the following vitamins is **not** fat soluble?
- A. A
 - B. C
 - C. E
 - D. K
8. The act of mating in the domestic fowl is termed
- A. farrowing.
 - B. kindling.
 - C. treading.
 - D. tugging.
9. Different forms of the same gene are referred to as
- A. alleles.
 - B. genotypes.
 - C. phenotypes.
 - D. traits.
10. The following properties describe bases **except**
- A. they have sweet taste.
 - B. they have a soapy feeling.
 - C. they are corrosive.
 - D. their pH is greater than 7.
11. The process of converting alternating voltage to direct voltage is known as
- A. doping.
 - B. induction.
 - C. rectification.
 - D. transformation.
12. Which of the following instruments can be used to measure volume of a liquid?
- I. Burette
 - II. Hydrometer
 - III. Pipette
 - IV. Measuring cylinder
- A. I and III only
 - B. II and III only
 - C. I, III and IV only
 - D. I, II, III and IV

13. The **most** essential climatic factor that determines the distribution of crops is
- A. relative humidity.
 - B. rainfall.
 - C. sunshine.
 - D. wind.
14. Which of the following occurrences results in the formation of rainbow?
- I. Reflection of light
 - II. Refraction of light
 - III. Dispersion of light
- A. I only
 - B. I and II only
 - C. I and III only
 - D. II and III only
15. Which of the following gases is/are air pollutant(s)?
- I. SO_2
 - II. N_2
 - III. CO
- A. II only
 - B. III only
 - C. I and III only
 - D. II and III only
16. Which of the following statements is **not** a reason for processing crops? To
- A. increase yield
 - B. increase shelf life
 - C. reduce post-harvest loss
 - D. improve taste
17. A solid-circular cone placed on its side rolls when slightly displaced. This is an illustration of
- A. stable equilibrium.
 - B. neutral equilibrium.
 - C. unstable equilibrium.
 - D. centre of gravity.
18. One similarity of the epidermis of a leaf to the human skin is that both
- A. allow for exchange of gases.
 - B. are sensitive to environmental changes.
 - C. are in layers.
 - D. excrete urea.
19. The hydrogen atom ${}^1_1\text{H}$ differs from other atoms in that it
- A. has no protons.
 - B. has no electrons.
 - C. has no neutrons.
 - D. cannot form ions.

20. The efficiency of a machine is 60 %. How much energy input is needed to perform a work of 10 J?
A. 10.8 J
B. 14.8 J
C. 15.9 J
D. 16.7 J
21. Biuret solution is added to egg white and the mixture heated. The colour of the resulting solution is
A. black.
B. blue.
C. red.
D. violet.
22. A body travelling at 20 m s^{-1} was brought to rest in 1 minute. Calculate the distance the body covered within the minute.
A. 10 m
B. 20 m
C. 600 m
D. 1200 m
23. The mass of 0.1 mole of nitrogen(I) oxide is
[N = 14, O = 16]
A. 3.0 g.
B. 4.4 g.
C. 4.6 g.
D. 44.0 g.
24. The diameter of herbaceous plants decreases in the evening because of
A. reduction in growth.
B. reduction in photosynthesis.
C. increasing rate of transpiration.
D. decreasing light intensity.

The following list consists of some agricultural practices:
Use it to answer questions 25 to 27.

- I. Crop rotation
II. Bush fallowing
III. Application of inorganic fertilizers
25. Which of the practices improve soil fertility?
A. I and II only
B. I and III only
C. II and III only
D. I, II and III
26. Which of the practices destroy(s) soil structure?
A. II only
B. III only
C. I and II only
D. I and III only

27. Which of the practices solve(s) specific nutrient deficiency of the soil?
- II only
 - III only
 - I and II only
 - I and III only
28. Two standard resistors **each** of $25\ \Omega$ are connected in **parallel** in a circuit. Determine the effective resistance of the resistors.
- $0.08\ \Omega$
 - $12.50\ \Omega$
 - $25.00\ \Omega$
 - $50.00\ \Omega$
29. A $1\ \text{dm}^3$ aqueous solution was prepared using 10 g of sodium hydroxide. Calculate the concentration of the solution. [Relative molecular mass of sodium hydroxide = 40]
- $0.20\ \text{mol dm}^{-3}$
 - $0.25\ \text{mol dm}^{-3}$
 - $0.30\ \text{mol dm}^{-3}$
 - $0.35\ \text{mol dm}^{-3}$
30. $\text{Ca}(\text{NO}_3)_2$ is the salt produced from the reaction between
- CaCO_3 and HNO_3
 - CaO and HNO_3
 - $\text{Ca}(\text{OH})_2$ and HCl

Which of the statements above is/are **correct**?

- I only
 - I and II only
 - II and III only
 - I, II and III
31. The vacuum in the Thermos flask is meant to minimize heat loss through
- conduction and radiation only.
 - convection and radiation only.
 - conduction and convection only.
 - conduction, convection and radiation.
32. Diabetes management involves
- having regular physical exercise.
 - taking appropriate diet.
 - adherence to drug prescriptions.

Which of the statements above are **correct**?

- I and II only
- I and III only
- II and III only
- I, II and III

33. In which of the following organisms does the reaction $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$ occur?
- Spirogyra*
 - Rhizopus*
 - Amoeba*
 - Paramecium*
34. A pleasant fruity scent is produced when a mixture of an alkanol and a compound A is warmed in the presence of concentrated sulphuric acid. A could be
- an alkene.
 - an alkanoate.
 - an alkanolic acid.
 - starch.
35. A sewing needle has a pointed end of surface area 0.5 mm^2 . If the needle is used to sew by applying a force of 5 N , calculate the pressure exerted by the needle on the cloth.
- $1.0 \times 10^7\text{ Pa}$
 - $5.0 \times 10^6\text{ Pa}$
 - $1.0 \times 10^5\text{ Pa}$
 - 2.5 Pa
36. An example of artificial ecosystem is
- rain forest.
 - fish pond.
 - estuary.
 - desert.
37. Radioisotopes are used in
- food preservation.
 - treatment of diseases.
 - pest control.
- Which of the statements above are **true**?
- I and II only
 - I and III only
 - II and III only
 - I, II and III
38. An atom Y combines with two hydrogen molecules to form YH_4 . The bonds in the molecule are **likely** to be
- metallic.
 - covalent.
 - electrovalent.
 - coordinate.
39. Deoxygenated blood from the muscles of the leg returns to the heart through the
- pulmonary artery.
 - anterior vena cava.
 - pulmonary vein.
 - aorta.

Turn over

40. Which of the following housing systems of poultry is affected by the topography of the land?
- Movable fold unit
 - Deep litter system
 - Battery cage system
 - Run system
41. The pituitary gland is known as the master gland because
- it is larger than other glands.
 - it is positioned above all other glands.
 - its secretion controls other glands.
 - it secretes more hormones than other glands.
42. Which of the following processes is an artificial process that requires oxygen?
- Welding
 - Photosynthesis
 - Tissue respiration
 - Rusting
43. Which of the following statements about insect pollinated flowers is **correct**? They
- are inconspicuous.
 - do not secrete nectar.
 - have sticky stigma.
 - have stamens with long filament.
44. Which of the following statements about a diode in forward bias mode is are true?
- The *n*-type semiconductor is connected to the positive terminal of the cell
 - The *p*-type semiconductor is connected to the positive terminal of the cell
 - The *n*-type semiconductor is connected to a switch.
- I only
 - II only
 - III only
 - II and III only
45. *Leghorn* is a breed of
- cattle.
 - fowl.
 - pig.
 - rabbit.
46. The number of cervical vertebrae in humans is
- 5.
 - 7.
 - 8.
 - 12.
47. The quality of sound depends on which of the following factors?
- Frequency
 - Loudness
 - Overtones
 - Wavelength

48. A useful by-product of saponification is
- A. fats.
 - B. glycerine.
 - C. sodium hydroxide.
 - D. detergents.
49. *Mastitis* of cattle is caused by
- A. bacteria.
 - B. fungi.
 - C. protozoa.
 - D. virus.
50. Carbohydrates are stored in the liver and muscles in the form of
- A. cholesterol.
 - B. glucose.
 - C. glycogen.
 - D. triglycerides.

END OF PAPER

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