PC 5171
WASSCE (PC1) 2025
INTEGRATED SCIENCE 1
Ojective Test
1 hour

1

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination
for Private Candidates

(PC1) 2025 — INTEGRATED SCIENCE 1 — 1 hour
[50 marks]

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

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', '(PC1) 2025', 'INTEGRATED SCIENCE', and '1' respectively.
   (*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 Ahmed Kojo AKOH His *index number* is 7102143958 and he is offering *Integrated Science* 1.

THE WEST AFRICAN EXAMINATIONS COUNCIL
ANSWER SHEET

PRINT IN BLOCK LETTERS

Name: AKOH AHMED KOJO | GHA

Examination: WASSCE (PC1) Year: 2025

Subject: INTEGRATED SCIENCE Paper: 1

INSTRUCTIONS TO CANDIDATES
1. Use grade 2B pencil throughout.
2. Answer each question by choosing one letter and shading like this: ⊏A⊐ ⊏B⊐ ⊏C⊐ ⊏D⊐
3. Erase completely any answer 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.

INDEX NUMBER	0	1	2	3	4	5	6	7	8	9
7	⊏0⊐	⊏1⊐	⊏2⊐	⊏3⊐	⊏4⊐	⊏5⊐	⊏6⊐	■	⊏8⊐	⊏9⊐
1	⊏0⊐	■	⊏2⊐	⊏3⊐	⊏4⊐	⊏5⊐	⊏6⊐	⊏7⊐	⊏8⊐	⊏9⊐
0	■	⊏1⊐	⊏2⊐	⊏3⊐	⊏4⊐	⊏5⊐	⊏6⊐	⊏7⊐	⊏8⊐	⊏9⊐
2	⊏0⊐	⊏1⊐	■	⊏3⊐	⊏4⊐	⊏5⊐	⊏6⊐	⊏7⊐	⊏8⊐	⊏9⊐
1	⊏0⊐	■	⊏2⊐	⊏3⊐	⊏4⊐	⊏5⊐	⊏6⊐	⊏7⊐	⊏8⊐	⊏9⊐
4	⊏0⊐	⊏1⊐	⊏2⊐	⊏3⊐	■	⊏5⊐	⊏6⊐	⊏7⊐	⊏8⊐	⊏9⊐
3	⊏0⊐	⊏1⊐	⊏2⊐	■	⊏4⊐	⊏5⊐	⊏6⊐	⊏7⊐	⊏8⊐	⊏9⊐
9	⊏0⊐	⊏1⊐	⊏2⊐	⊏3⊐	⊏4⊐	⊏5⊐	⊏6⊐	⊏7⊐	⊏8⊐	■
5	⊏0⊐	⊏1⊐	⊏2⊐	⊏3⊐	⊏4⊐	■	⊏6⊐	⊏7⊐	⊏8⊐	⊏9⊐
8	⊏0⊐	⊏1⊐	⊏2⊐	⊏3⊐	⊏4⊐	⊏5⊐	⊏6⊐	⊏7⊐	■	⊏9⊐

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

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 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 in this question paper.

Now answer the following questions.

1. The rate at which energy is used is known as
   A. work done.
   B. power.
   C. mechanical advantage.
   D. velocity ratio.

2. The chloroplast in a plant cell is associated with the production of
   A. lipids.
   B. proteins.
   C. vitamins.
   D. carbohydrates.

3. In flowering plants, mineral salts are transported through the
   A. cambium.
   B. phloem.
   C. pith.
   D. xylem.

4. Which of the following hormones maintains pregnancy in humans?
   A. Oestrogen
   B. Testosterone
   C. Follicle-stimulating hormone
   D. Progesterone

5. *Biotechnology* involves the following people **except**
   A. Biologists.
   B. Chemists.
   C. Engineers.
   D. Nuclear Scientists.

6. Which of the following diseases may produce blood in a person's urine?
   A. Bilharzia
   B. Malaria
   C. Measles
   D. Rabies

7. Living cells of plants and animals have
   A. cell walls.
   B. contractile vacuoles.
   C. chloroplast.
   D. ribosomes.

8. Organic matter does **not** persist in tropical soils because
   A. there are fewer micro-organisms in the soil.
   B. high temperature accelerates decomposition.
   C. of the high level of erosion.
   D. soils are stripped bare of their protective cover.

9. Impurities found in bauxite are
   A. SiO_2 and $FeCl_3$.
   B. Fe_2O_3 and SiO_2.
   C. FeO and CaO.
   D. CaO and Fe_2O_3.

10. Chemistry of carbon compounds is studied under
    A. biochemistry.
    B. inorganic Chemistry.
    C. organic Chemistry.
    D. physical Chemistry.

11. Which of the following sources of water is **not** directly linked to the sea?
    A. Rivers
    B. Streams
    C. Lagoons
    D. Ponds

12. Quantity of electricity is measured in
    A. ampere.
    B. coulomb.
    C. volt.
    D. watt.

13. In the nitrogen cycle, the bacteria that converts nitrates to atmospheric nitrogen is
    A. Nitrifying bacteria.
    B. Denitrifying bacteria.
    C. Nitrogen fixing bacteria.
    D. Putrefying bacteria.

14. Which of the following phenomena is associated with the moon?
    A. Tide
    B. Earthquake
    C. Sea breeze
    D. Volcanic eruption

15. Which of the following acids does **not** react with metals to produce hydrogen gas?
    A. H_2SO_4
    B. HNO_3
    C. HCl
    D. CH_3COOH

16. An example of discontinuous variation is
    A. baldness.
    B. skin colour.
    C. hair colour.
    D. intelligence.

Use the statement below to answer questions **17** and **18**.

An effort of 50 N moves a load of 100 N through a distance of 5 m. If the effort moves through a distance of 2 m, determine:

17. The work input of the device.
    A. 100 J
    B. 200 J
    C. 500 J
    D. 1000 J

18. The work output.
    A. 500 J
    B. 250 J
    C. 100 J
    D. 50 J

19. One difference between fermentation and aerobic respiration is that fermentation
    A. results in the production of heat.
    B. produces alcohol.
    C. involves living organisms.
    D. produces water.

20. A man heterozygous for sickle cell trait marries a woman of the same genotype. What percentage of their children would have sickle cell?
    A. 25 %
    B. 50 %
    C. 75 %
    D. 100 %

21. One of the ways of preventing the sow from crushing piglets is to
A. creep feed piglets.
B. provide farrowing rails.
C. separate piglets from sow.
D. tether the sow.

22. Copper and silver are able to resist corrosion and are therefore **suitable** for making
A. alloys.
B. coins.
C. transistors.
D. paints.

23. Abrasions and chipping off processes in rock weathering is caused by
I. wind.
II. water.
III. animals.

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

24. Which of the following structures play active role in inspiration?
I. Diaphragm
II. Heart
III. Lung

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

25. Which of the following elements is a ferromagnetic metal?
A. Silver
B. Nickel
C. Mercury
D. Copper

26. When red light is mixed with green light, the product is
A. blue light.
B. cyan light.
C. magenta light.
D. yellow light.

27. The difference in the note sung by a child and an adult boy will be found in the
A. loudness.
B. quality.
C. pitch.
D. wavelength.

28. Determine the number of atoms in 0.12 g of carbon.
[Avogadro's number = 6.02×10^{23} mol^{-1}, C = 12]

A. 6.02×10^{21} atoms
B. 3.01×10^{23} atoms
C. 6.02×10^{25} atoms
D. 12.30×10^{16} atoms

29. Semi-conductors are used in manufacturing
I. transistors.
II. diodes.
III. microphones.

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

30. *Anthrax* is a disease that affects
A. cattle.
B. pigs.
C. poultry.
D. rabbits.

31. Transfusion of incompatible blood into a patient may lead to
A. production of antigens.
B. bursting of red blood cells.
C. formation of clots of blood.
D. production of antibodies.

Which of the following motions is rotational?
A. An athlete running a 100 m race
B. A swinging pendulum
C. The earth moving round on its axis
D. The earth moving round the sun

33. What is the chemical formula for Nitrogen (II) oxide?
A. N_2O
B. N_2O_4
C. NO
D. NO_2

34. In the digestive system of a mammal, glucose and amino acids are absorbed in the
A. caecum.
B. colon.
C. duodenum.
D. ileum.

35. An infectious disease has the characteristic of
A. being resistant to treatment.
B. easy transmission from one person to another.
C. easy recurrence after treatment.
D. being very chronic.

36. Which of the following pairs of farm animals could be affected by coccidiosis?
A. Cattle and goat
B. Goat and poultry
C. Poultry and rabbits
D. Rabbits and cattle

37. Heat is generated in the human body during
A. defaecation.
B. expiration.
C. shivering.
D. sweating.

38. The part of a flower which forms part of the pistil is
A. anther.
B. filament.
C. receptacle.
D. style.

39. The cell sap in plant cells is associated with the
A. cell wall.
B. nucleus.
C. chloroplast.
D. vacuole.

40. The bond formed between magnesium and chlorine is **likely** to be
I. hydrogen bond.
II. ionic bond.
III. covalent bond.

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

Use the following food chain to answer question **41**.

Grass →Grasshopper→Toad→Snake

41. Which of the organisms occupy the first trophic level?
A. Grasshopper
B. Grass
C. Toad
D. Snake

42. Which of the following processes transform solar energy into chemical energy?
A. Photosynthesis
B. Respiration
C. Transpiration
D. Osmosis

43. Which of the following statements about air mass are **correct**?
I. Has uniform temperature
II. Has non-uniform pressure
III. Forms over large expanse of land and water

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

44. Alpha decay involves the emission of
A. electrons.
B. neutrons.
C. positrons.
D. helium nuclei.

45. Which of the following statements about metabolic activity in plants is **not** correct?
A. The rate is slower than in animals of similar weight.
B. Its waste products accumulate more slowly than in animals.
C. Waste products are stored in certain parts of the plant.
D. Waste products include urea.

46. Which of the following structures in humans does **not** contain one-way valves?
A. Heart
B. Veins
C. Capillaries
D. Lymph vessels

47. Reflex actions
A. happen slowly.
B. take a long path.
C. involve thinking.
D. are automatic.

48. A step-up transformer has
I. more turns in the secondary coil than in the primary coil.
II. more turns in the primary coil than the secondary coil.
III. has higher voltage in the output than in the input.

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

49. Which of the following substances is hazardous?
A. CO
B. CO_2
C. Ne
D. He

50. *Pruning* in vegetable production **mainly** aims at
A. controlling pests.
B. easing movement of the farmer.
C. inducing large fruit development.
D. enhancing root development.

END OF PAPER

PC5172
WASSCE (PC1) 2025
INTEGRATED
SCIENCE 2
Essay Test
1½ hours

2

CANDIDATE'S NAME	

INDEX NUMBER	SIGNATURE

DATE:

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination
for Private Candidates

(PC1) 2025 — INTEGRATED SCIENCE 2 [Essay] — 1½ hours

INSTRUCTIONS TO CANDIDATES

1. *In the spaces provided above, insert your* **name**, **full index number**, *normal* **signature** *and the* **date of examination**.
2. *This booklet consists of* **six** *questions. Answer* **four** *questions in all.* **All** *questions carry* **equal** *marks.*
3. *Write the* **question number** *and your* **index number at the top of each page.**
4. *Write on* **both** *sides of the paper unless otherwise instructed on the question paper.*
5. *Begin* **each** *answer to a question on a fresh page. Leave two lines between answers where there are sub-sections to the same question.*
6. *On* **no account** *should you tear off any part of the booklet.* **It is an examination malpractice to do so.** *The entire booklet will be collected at the end of the examination.*
7. *Write in the space provided below, the* **number of the questions you have answered** *in the order in which you have written them.*

For Examiner's Use Only	
Question Number	Mark
TOTAL	

PAPER 2 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 is meant by *sickle cell crisis*? [2 marks]
(ii) State **three** symptoms of sickle cell crisis. [3 marks]

(*b*) (i) Explain the term *load* as used in an electrical circuit. [2 marks]
(ii) List **three** household devices that can be classified as *loads* in an electrical circuit. [3 marks]

(*c*) (i) Name **one:**
(α) acid ;
(β) metal.
that could be used to prepare hydrogen gas in the laboratory. [2 marks]

(ii) A concentrated acid is labelled 10 mol dm^{-3}. Calculate the volume of the acid that would be required to prepare 1 dm^3 of 2 mol dm^{-3} of the acid.
[Leave the answer in cm^3] [3 marks]

(*d*) (i) Explain the term *breeding* as used in livestock production. [2 marks]
(ii) State **three** types of breeding systems of livestock in Ghana. [3 marks]

2. (*a*) (i) What is *thermal expansion*? [2 marks]
(ii) State **two** situations **each** in which thermal expansion can be
(α) disadvantageous;
(β) minimized. [4 marks]

(*b*) (i) List **two** hazardous substances in a working environment. [2 marks]
(ii) State **three** effects of hazardous substances on the human body. [3 marks]

(*c*) Give **two** reasons **each** for undertaking the following practices in poultry:
(i) Decombing;
(ii) Debeaking. [4 marks]

(*d*) (i) Explain the term *ecosystem*. [2 marks]
(ii) State **three** ways in which food chains are important in ecosystems. [3 marks]

3. (*a*) (i) Explain the term *esterification*. [2 marks]
(ii) State **three** differences between *esterification* and *neutralization*. [3 marks]

(*b*) (i) Explain the term *mulching*. [2 marks]
(ii) Give **three** reasons for practising mulching on a carrot farm. [3 marks]

(*c*) (i) What is *ovarian cyst*? [2 marks]
(ii) State **two** causes of ovarian cyst. [2 marks]

(*d*) (i) Explain the following terms associated with sound waves:
(α) rarefaction;
(β) compression. [4 marks]

(ii) A sound wave of frequency 256 Hz sends a wave into air at 29 °C . If the velocity of sound in air at 29 °C is 340 ms^{-1}, calculate the distance between a rarefaction and compression. [2 marks]

4. (*a*) (i) Differentiate between a *vector* and a *parasite*. [2 marks]
(ii) State **four** ways in which parasites affect agricultural productivity. [4 marks]

(*b*) (i) What is *human dentition*? [2 marks]
(ii) Name the part of the alimentary canal where the following digestive juices are found:
(α) gastric juice;
(β) pancreatic juice;
(γ) saliva. [3 marks]

(*c*) (i) Define *electric power*. [2 marks]
(ii) An electric generator produces power of 20 kW. If this power is passed into a coil in an appliance of 400 V across it, calculate the resistance of the coil. [3 marks]

(*d*) (i) Explain the term *rusting*. [2 marks]
(ii) List **two** factors that can affect the rate of rusting. [2 marks]

5. (*a*) (i) State Mendel's Law of Segregation. [2 marks]
(ii) What is meant by a *dominant character* as used in Genetics? [2 marks]
(iii) Give **two** examples of dominant characters in humans. [2 marks]

(*b*) An aqueous solution is labelled 0.5 M NaOH.
(i) List **two** measuring instruments required to prepare the solution. [2 marks]
(ii) Calculate the mass of NaOH needed to prepare 500 cm^3 of the solution. [molar mass of NaOH = 40 g mol^{-1}] [3 marks]

(*c*) (i) What is a *cyclone*? [2 marks]
(ii) State **two** precautions to be taken to minimize the effect of cyclones. [2 marks]

(*d*) (i) Differentiate between *sexual* and *vegetative* propagation of crops. [2 marks]
(ii) State **three** planting materials that could be used in vegetative propagation. [3 marks]

6. (*a*) (i) What is a *simple machine*?. [2 marks]
(ii) A machine was used to raise a load 200 N by the application of a force of 120 N. If the efficiency of the machine is 60 %, calculate the velocity ratio. [3 marks]

(*b*) Explain **briefly** how **each** of the following practices control pests in maize cultivation:
(i) ploughing;
(ii) timing of planting;
(iii) early harvesting. [6 marks]

(*c*) (i) What is *acid rain*? [2 marks]
(ii) Name **two** pollutants that could cause acid rain. [2 marks]
(iii) State **one** effect of acid rain on the environment. [1 mark]

(*d*) (i) Name the scientific process involved in salting fish for preservation. [1 mark]

(ii) Explain **briefly** how the process named in (*d*)(i) helps to preserve the fish. [3 marks]

END OF PAPER

PC5173
WASSCE (PC1) 2025
INTEGRATED
SCIENCE 3
Test of Practical Work
2 hours

3

CANDIDATE'S NAME	

INDEX NUMBER	SIGNATURE

DATE:

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination
for Private Candidates

(PC1) 2025 — INTEGRATED SCIENCE 3 — 2 hours

TEST OF PRACTICAL WORK

[60 marks]

DIRECTIONS TO CANDIDATES

1. Do **not** turn over this booklet until you are told to do so.
2. In the spaces provided above, insert your **name**, **full Index number**, **normal signature** and the **date of examination**.
3. Answer **all** the questions in this booklet.
4. On **no account** should you tear **any** part of the booklet. The entire booklet will be collected at the end of the test.
5. **All rough work should be done in this booklet** and then crossed out neatly. Under **no circumstance** should you work on **any** other paper.
6. Write the **NUMBERS OF THE QUESTIONS YOU HAVE ANSWERED** in the order in which you have answered them, in the space provided below.

For Examiner's Use Only	
Question Number	**Mark**
TOTAL	

1. Figure **1** is an illustration of a structure used for housing poultry.
Study the figure carefully and answer the questions that follow.

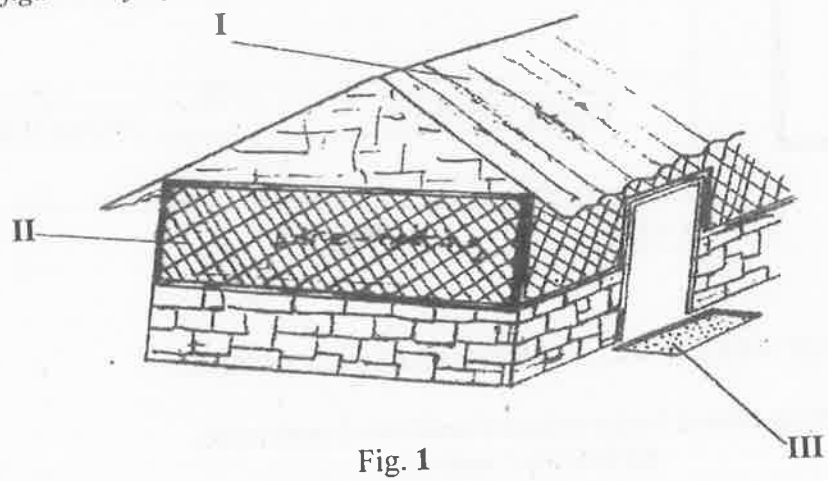


Fig. **1**

(*a*) Name the type of housing management illustrated.

.....
[1 mark]

(*b*) Name **each** of the parts labelled **I**, **II** and **III**.

I.....

II.....

III.....
[3 marks]

(*c*) State **one** function of the part labelled **I**.

.....
[1 mark]

(*d*) State **two** reasons for using the part labelled **II** to cover the greater portion of the structure.

.....

.....

.....

.....
[2 marks]

(*e*) Describe briefly **three** reasons for providing the part labelled **III**.

.....

.....

.....

.....

.....

.....

[3 marks]

(*f*) Name **four** materials that should be provided in this type of housing management.

.....

.....

.....

.....

[4 marks]

2. Fig. **2** is a diagram of a male human body showing the locations of ductless glands labelled **I, II, III, IV,** and **V,** that produce hormones **A, B, C, D** and **E** respectively in the body.
Study the diagram carefully and answer the questions that follow.

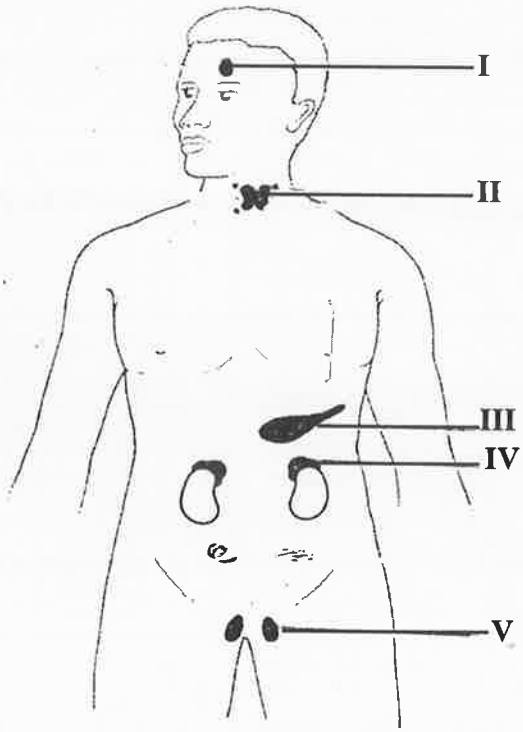


Fig. **2**

(*a*) Name the ductless gland located at **each** of the locations labelled **I, II, III, IV** and **V.**

I .....

II .....

III .....

IV .....

V .....

[5 marks]

(*b*) Name the hormone produced by **each** of the glands named in (*a*).

A .....

B .....

C .....

D .....

E .....

[5 marks]

(*c*) State **one** function **each** of the hormones produced by the glands at locations labelled **II, III** and **V**.

B .....

C .....

E .....

[3 marks]

(*d*) State **one** effect **each** of underproduction of the hormones by the glands at locations labelled **II, III,** and **V**.

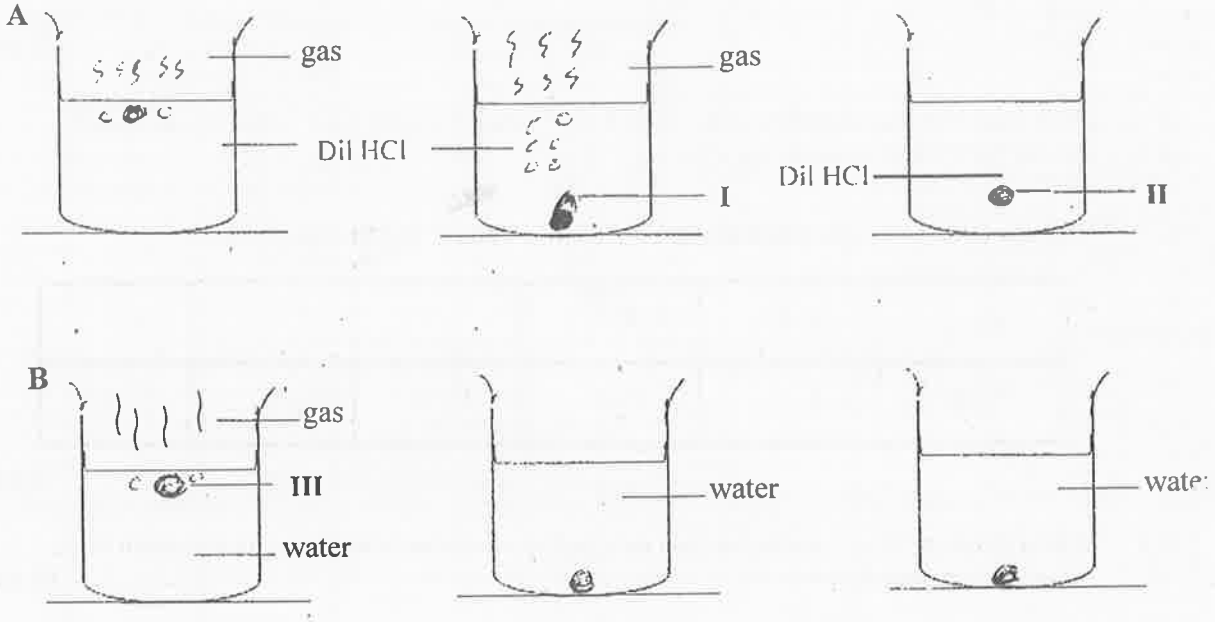
B .....

C .....

E .....

[3 marks]

3. Fig. 3 is an illustration of activities performed to investigate the reactivity of **three** metals labelled **I**, **II** and **III**. The metals were **each** reacted with water and dilute hydrochloric acid and later identified as silver, sodium and zinc but in no particular order.
Study the figure carefully and answer the questions that follow.



(*a*) Predict the name of **each** of the metals labelled **I**, **II** and **III**.

I.....

II.....

III.....

[3 marks]

(*b*) Name the metal which reacts with **both** water and dilute hydrochloric acid.

.....

[1 mark]

(*c*) Write a word equation for the reaction between metal **I** and dilute hydrochloric acid.

.....

.....

[2 marks]

(*d*) Name the products formed for the reaction between metal **III** and water.

.....

[2 marks]

(*e*) (i) Name the metals preferred in the production of ornaments and jewellery.

.....

[1 mark]

(ii) Give **one** reason for the answer given in (i).

.....

[1 mark]

(*f*) Name **one** metal that could show similar reactivity in dilute hydrochloric acid as

(i) **I** .....

(ii) **II** .....

[2 marks]

4. A car moved from rest and attained a velocity of 6 ms^{-1} after 2 s and 12 ms^{-1} after 4 s. It moved at this velocity for 7 s and came to rest after 5 s.

(*a*) Use the information provided to draw a table of t/s and V/ms^{-1} as shown below.

t/s	$t_1 =$	$t_2 =$	$t_3 =$	$t_4 =$	$t_5 =$
V/ms^{-1}	$V_1 =$	$V_2 =$	$V_3 =$	$V_4 =$	$V_3 =$

[5 marks]

(*b*) Plot a graph of V/ms^{-1} on the vertical axis and t/s on the horizontal axis on the graph sheet provided on page 7. [5 marks]

(*c*) Explain the stages of movement of the car using the graph from 0-2 s, 4-11 s and between 11-16 s.

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[3 marks]

(*d*) Determine the total distance travelled by the car.

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[3 marks]

(*e*) Calculate the average velocity of the car.

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[2 marks]

END OF PAPER