

FREE SAMPLE: THE FIRST QUESTION

Question 1 (50 marks)

(a) A student investigated whether temperature affects how many bean seeds germinate. Twenty seeds were placed on damp cotton wool at each temperature for five days. The results are shown in the table.

- (i) Name the independent variable in this investigation.
- (ii) Name the dependent variable.
- (iii) State two factors that were kept constant.
- (iv) Calculate the percentage of seeds that germinated at 25 °C.
- (v) State the temperature at which most seeds germinated.
- (vi) State a conclusion that can be drawn from the results.
- (vii) Suggest one way to make the results more reliable.

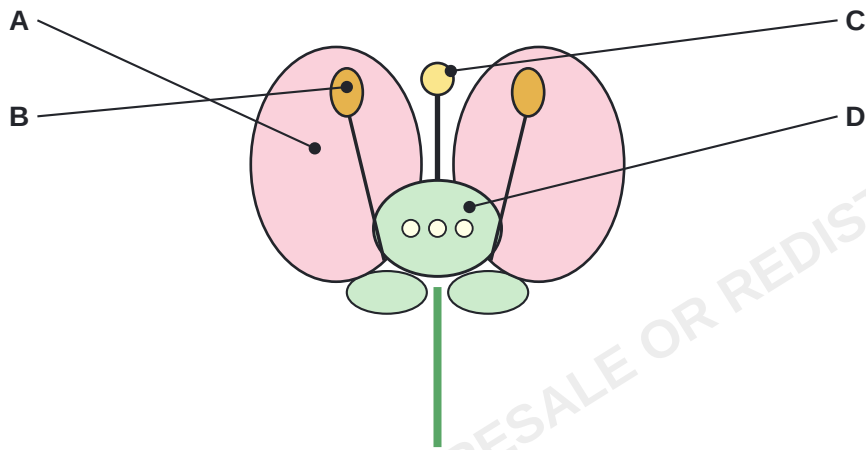
Temperature (°C)	5	15	25	35	45
Seeds germinated (out of 20)	2	9	18	15	3

[10 marks]

(b) The diagram shows a flower.

- (i) Name the parts labelled A, B, C and D. Choose from this list: petal, anther, stigma, ovary, sepal.
- (ii) State the function of the anther.
- (iii) What is meant by pollination?
- (iv) Is this flower adapted to wind pollination or insect pollination? Give a reason from the diagram.
- (v) What does the ovule become after fertilisation?

[10 marks]



A flower cut in half (not to scale).

(c) The endocrine system makes hormones. Complete the table by writing the gland that makes each hormone. Choose from this list: pancreas, thyroid, adrenal gland, pituitary gland.

(i) Complete the table: write the gland that makes insulin, thyroxine, adrenaline and FSH.

(ii) State one effect of insulin in the body.

(iii) Hormones are carried around the body in which body fluid?

(iv) State one difference between a nervous response and a hormonal response.

(v) Name the gland in the list that is also part of the digestive system.

Hormone	Gland that makes it
Insulin	
Thyroxine	
Adrenaline	
FSH	

[10 marks]

(d) The diagram shows the human chest cavity.

(i) Name the structures labelled A, B, C and D. Choose from this list: trachea, bronchus, lung, diaphragm, ribs.

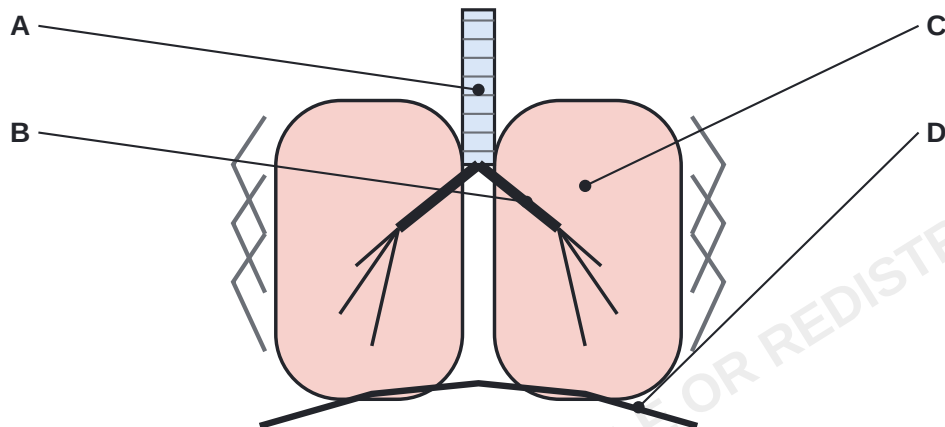
(ii) The trachea is held open by rings of cartilage. State the function of these rings.

(iii) Name the gas that passes from the alveoli into the blood.

(iv) Name the muscles between the ribs that help us to breathe.

(v) What happens to the diaphragm during inhalation (breathing in)?

[10 marks]



The human chest cavity (front view, not to scale).

(e) Living things share characteristics, and scientists classify them.

(i) State two characteristics of life.

(ii) Suggest why it is difficult to describe a virus as a living organism.

(iii) Put a tick in the box beside each cell that is a eukaryotic cell (it has a nucleus).

(iv) Name the kingdom to which mushrooms belong.

(v) Name the three domains of life.

Cell	Tick if eukaryotic
Bacterium	
Yeast cell	
Human cheek cell	
Onion cell	

[10 marks]

QUESTIONS 2 TO 7

50 marks each · in the real paper you answer any FIVE

This practice paper prints all six so you can choose your best five, or attempt more than the real paper allows.

THE WORKED ANSWER TO THAT QUESTION

Question 1 (50 marks) [Compulsory question: Biological skills, plants, human systems and classification]

(a) A student investigated whether temperature affects how many bean seeds germinate. Twenty seeds were placed on damp cotton wool at each temperature for five days. The results are shown in the table.

(i) Name the independent variable in this investigation. (ii) Name the dependent variable. (iii) State two factors that were kept constant. (iv) Calculate the percentage of seeds that germinated at 25 °C. (v) State the temperature at which most seeds germinated. (vi) State a conclusion that can be drawn from the results. (vii) Suggest one way to make the results more reliable.

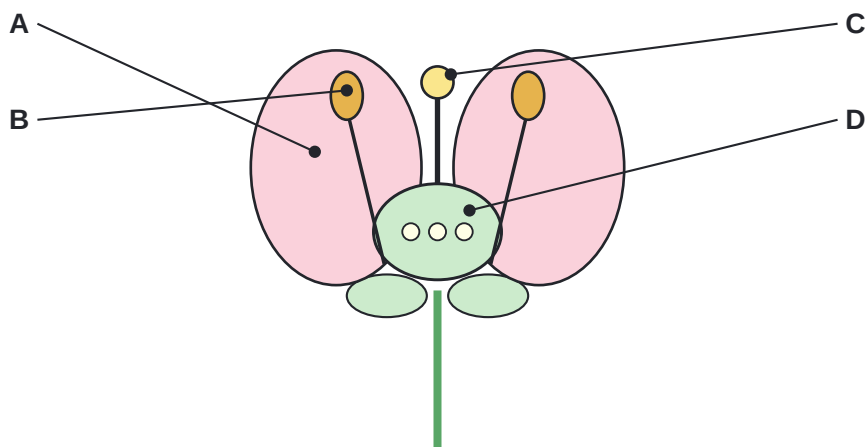
(a) Answer: (i) Temperature. (ii) The number of seeds that germinated. (iii) Number of seeds, moisture, time, type of seed (any two). (iv) 90%. (v) 25 °C. (vi) Seeds germinate best at about 25 °C; very low or very high temperatures reduce germination. (vii) Repeat the investigation and calculate the mean.

- Approach: name the variables, then read the table.
- (i) The factor the student changed was temperature 1 mark.
- (ii) The factor measured was the number of seeds that germinated 1 mark.
- (iii) Same number of seeds, same moisture and same time at each temperature (any two) 2 marks.
- (iv) $18 \div 20 \times 100 = 90\%$ 2 marks.
- (v) The highest number (18) germinated at 25 °C 1 mark.
- (vi) Germination rose to 25 °C and then fell as it became too hot 2 marks.
- (vii) A repeat reduces the effect of chance 1 mark.

KEY TAKEAWAY

In an investigation, change one (independent) variable, measure the dependent variable and keep all other factors constant.

(b) The diagram shows a flower. (i) Name the parts labelled A, B, C and D. Choose from this list: petal, anther, stigma, ovary, sepal. (ii) State the function of the anther. (iii) What is meant by pollination? (iv) Is this flower adapted to wind pollination or insect pollination? Give a reason from the diagram. (v) What does the ovule become after fertilisation?



A flower cut in half (not to scale).

(b) Answer: (i) A petal; B anther; C stigma; D ovary. (ii) It makes the pollen. (iii) The transfer of pollen from an anther to a stigma. (iv) Insect pollination; it has large, brightly coloured petals. (v) A seed.

- Approach: identify each part from its shape and position.
- (i) A is the large coloured petal, B the anther on its stalk, C the sticky stigma at the top of the style and D the ovary at the base 4 marks.
- (ii) The anther produces pollen grains (the male gametes) 1 mark.
- (iii) Pollen is carried from the anther to the stigma 2 marks.
- (iv) Large coloured petals attract insects; a wind-pollinated flower has small petals 2 marks.
- (v) The fertilised ovule becomes the seed 1 mark.

KEY TAKEAWAY

A flower: petals attract insects, the anther makes pollen, the stigma receives it and the ovule becomes the seed.

(c) The endocrine system makes hormones. Complete the table by writing the gland that makes each hormone. Choose from this list: pancreas, thyroid, adrenal gland, pituitary gland. (i) Complete the table: write the gland that makes insulin, thyroxine, adrenaline and FSH. (ii) State one effect of insulin in the body. (iii) Hormones are carried around the body in which body fluid? (iv) State one difference between a nervous response and a hormonal response. (v) Name the gland in the list that is also part of the digestive system.

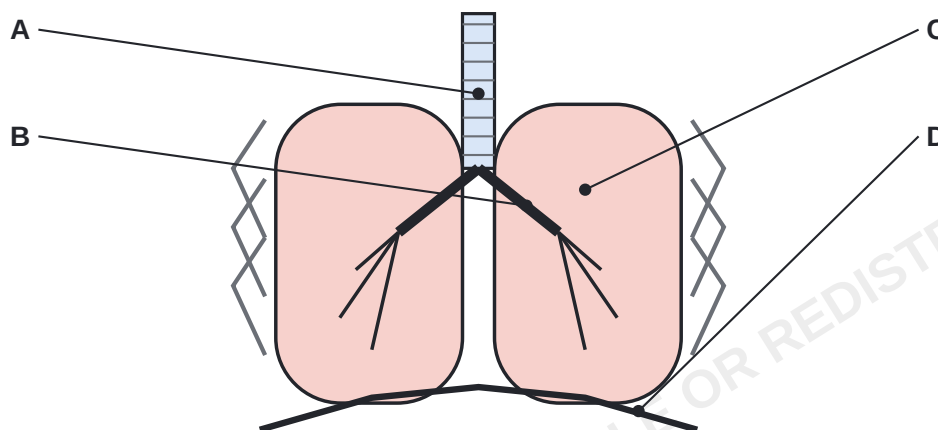
(c) Answer: (i) Insulin: pancreas; thyroxine: thyroid; adrenaline: adrenal gland; FSH: pituitary gland. (ii) It lowers the blood glucose level. (iii) The blood. (iv) Nervous responses are fast and short-lived; hormonal responses are slower and last longer. (v) Pancreas.

- Approach: match each hormone to its gland.
- (i) Insulin is made in the pancreas, thyroxine in the thyroid, adrenaline in the adrenal glands and FSH in the pituitary 4 marks.
- (ii) Insulin helps cells take up glucose and so lowers the blood glucose concentration 2 marks.
- (iii) Hormones travel in the blood to their target organs 1 mark.
- (iv) Impulses travel quickly along nerves, hormones travel in the blood so act more slowly but for longer 2 marks.
- (v) The pancreas makes digestive enzymes as well as insulin 1 mark.

KEY TAKEAWAY

Hormones are chemical messengers made by glands and carried in the blood: insulin from the pancreas lowers blood glucose.

(d) The diagram shows the human chest cavity. (i) Name the structures labelled A, B, C and D. Choose from this list: trachea, bronchus, lung, diaphragm, ribs. (ii) The trachea is held open by rings of cartilage. State the function of these rings. (iii) Name the gas that passes from the alveoli into the blood. (iv) Name the muscles between the ribs that help us to breathe. (v) What happens to the diaphragm during inhalation (breathing in)?



The human chest cavity (front view, not to scale).

(d) Answer: (i) A trachea; B bronchus; C lung; D diaphragm. (ii) They keep the airway open so air can always flow in and out. (iii) Oxygen. (iv) Intercostal muscles. (v) It contracts and moves down (flattens).

- Approach: follow the air from the nose to the alveoli.
- (i) A is the tube with rings, B is one of the two branches, C is the large organ and D is the sheet of muscle below the lungs 4 marks.
- (ii) The cartilage rings stop the trachea from collapsing 2 marks.
- (iii) Oxygen diffuses from the air in the alveoli into the blood 1 mark.
- (iv) The intercostal muscles raise the ribs 1 mark.
- (v) The diaphragm contracts and flattens, increasing the volume of the chest 2 marks.

KEY TAKEAWAY

Air passes down the trachea and bronchi to the lungs; the diaphragm and intercostal muscles change the volume of the chest.

(e) Living things share characteristics, and scientists classify them. (i) State two characteristics of life. (ii) Suggest why it is difficult to describe a virus as a living organism. (iii) Put a tick in the box beside each cell that is a eukaryotic cell (it has a nucleus). (iv) Name the kingdom to which mushrooms belong. (v) Name the three domains of life.

(e) Answer: (i) Movement, respiration, sensitivity, growth, reproduction, excretion, nutrition (any two). (ii) A virus can only reproduce inside a host cell and does not carry out the other characteristics of life by itself. (iii) Yeast cell, human cheek cell and onion cell. (iv) Fungi. (v)

Archaea, bacteria and eukaryota.

- Approach: recall the characteristics of life, then the cell types.
- (i) Living things respire, grow, reproduce, respond, excrete and take in nutrients (any two) 2 marks.
- (ii) A virus cannot respire, grow or reproduce on its own 2 marks.
- (iii) Bacteria have no nucleus; yeast, human and onion cells have a nucleus 3 marks.
- (iv) Mushrooms are fungi 1 mark.
- (v) The three domains are archaea, bacteria and eukaryota 2 marks.

KEY TAKEAWAY

Eukaryotic cells have a nucleus; bacteria and archaea do not; viruses are not cells.

LOS: Compulsory question: Biological skills, plants, human systems and classification (Leaving Certificate Biology, Ordinary Level written paper, All strands)

QUESTIONS 2 TO 7

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