



National
Qualifications
2018

X807/75/02

Biology
Section 1 — Questions

TUESDAY, 15 MAY

1:00 PM – 3:30 PM

Instructions for the completion of Section 1 are given on *page 02* of your question and answer booklet X807/75/01.

Record your answers on the answer grid on *page 03* of your question and answer booklet.

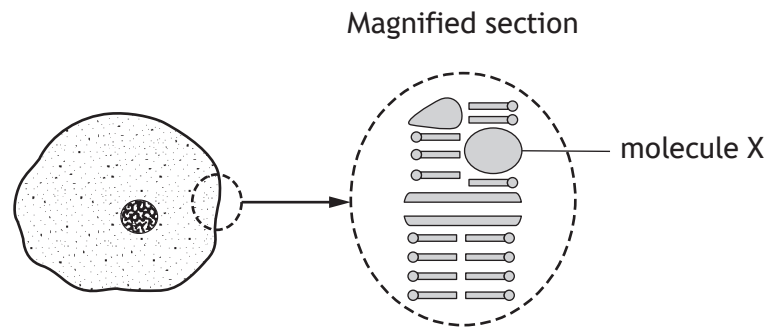
Before leaving the examination room you must give your question and answer booklet to the Invigilator; if you do not, you may lose all the marks for this paper.



* X 8 0 7 7 5 0 2 *

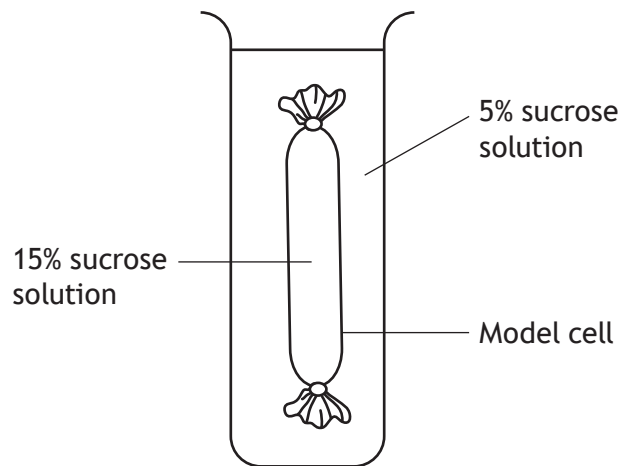
SECTION 1

1. The diagram shows a cell with a section of the cell membrane magnified.



Molecule X is

- A phospholipid
 - B protein
 - C cellulose
 - D starch.
2. The diagram shows an experiment in which a model cell was placed in a sucrose solution.



At the start of the experiment the model cell weighed 25 g and at the end it weighed 30 g.
What was the percentage increase in mass?

- A 5.0%
- B 16.7%
- C 20.0%
- D 83.3%

3. Glucose molecules in low concentration in the kidney have to be moved into the bloodstream, where there is a higher concentration of glucose.

The process responsible for this action is

- A osmosis
 - B diffusion
 - C passive transport
 - D active transport.
4. Which of the following represents the sequence of events in the production of a protein from the genetic code?

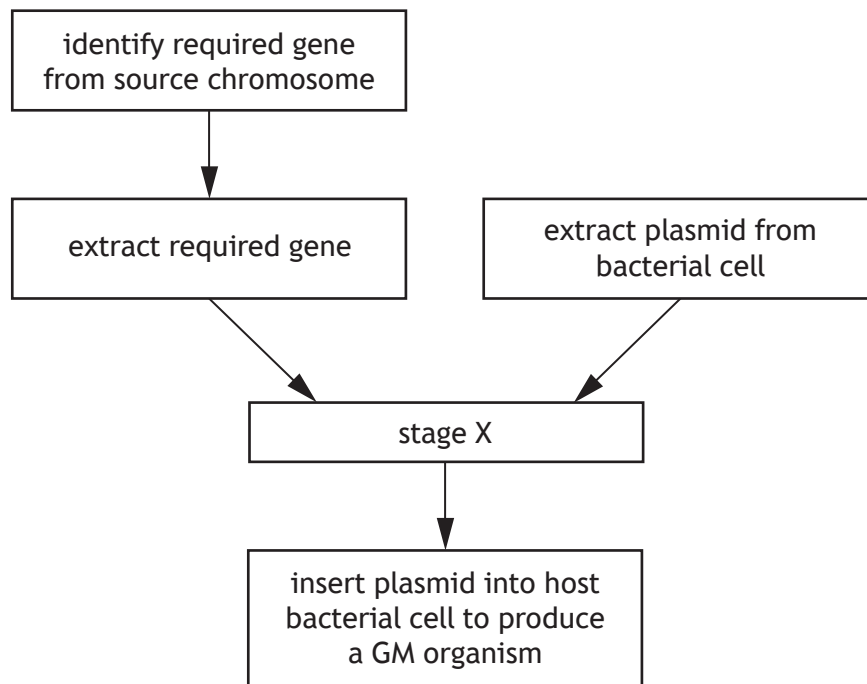
- A DNA \longrightarrow amino acids \longrightarrow mRNA \longrightarrow protein
- B DNA \longrightarrow mRNA \longrightarrow amino acids \longrightarrow protein
- C mRNA \longrightarrow DNA \longrightarrow amino acids \longrightarrow protein
- D amino acids \longrightarrow DNA \longrightarrow mRNA \longrightarrow protein

5. Which of the following are all types of proteins?

- A Hormones, enzymes and nitrates
- B Antibodies, enzymes and plasmids
- C Hormones, receptors and antibodies
- D Receptors, antibodies and nitrates

[Turn over

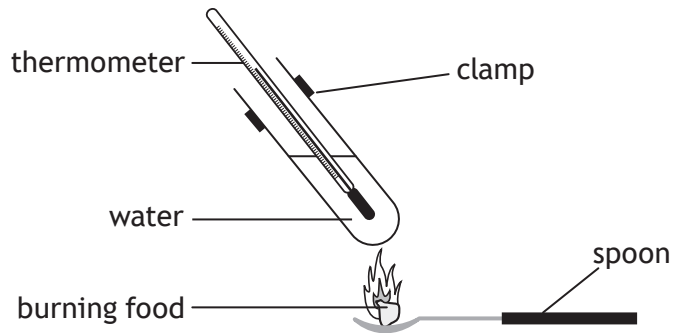
6. The flowchart represents some of the stages of genetic engineering.



A suitable description of stage X would be

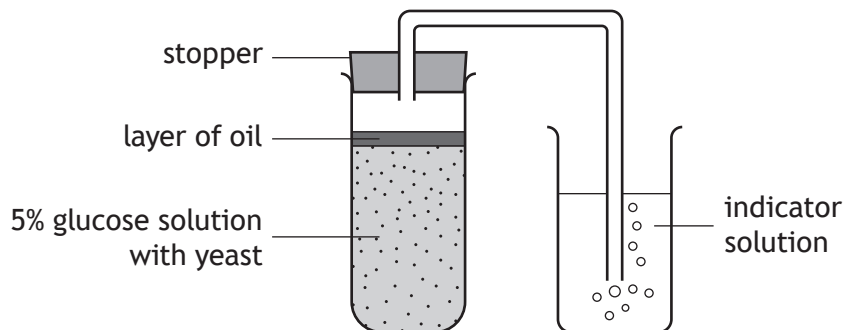
- A insert bacterial plasmid into required gene
- B insert bacterial plasmid into source chromosome
- C insert required gene into host bacterial cell
- D insert required gene into bacterial plasmid.

7. The diagram shows an experiment which can be used to find the energy content of different foods. Each food was completely burned and the energy content was estimated by the rise in temperature of the water.



The reliability of this experiment could be improved by

- A burning each food for the same length of time
 - B repeating the experiment with each food several times
 - C removing the thermometer from the tube to read it accurately
 - D repeating the experiment using a different food each time.
8. The apparatus shown was used to investigate the rate of respiration in yeast at 20 °C.

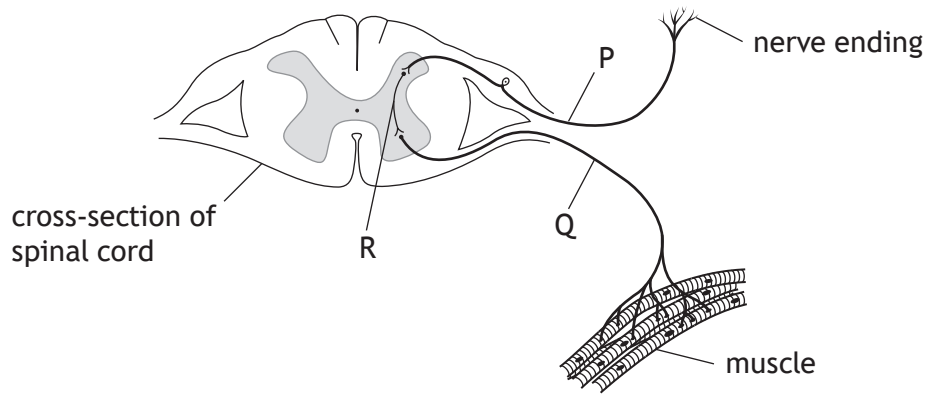


Which of the following changes would cause a decrease in the rate of respiration of the yeast?

- A Increase the thickness of the layer of oil by 1 mm.
- B Increase the temperature of the glucose solution by 1 °C.
- C Decrease the concentration of the glucose solution by 1%.
- D Decrease the volume of indicator solution by 1 cm³.

[Turn over

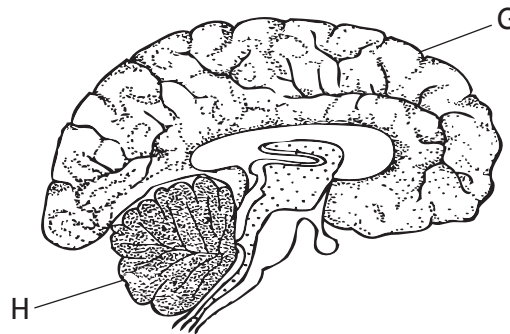
9. The diagram shows some of the structures found in a reflex arc.



Which row in the table identifies P, Q and R?

	<i>Motor neuron</i>	<i>Sensory neuron</i>	<i>Inter neuron</i>
A	Q	R	P
B	Q	P	R
C	R	P	Q
D	P	R	Q

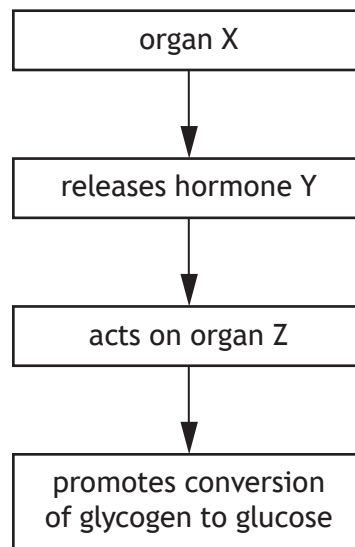
10. The diagram represents a section through the brain.



Which of the following links a letter to its correct structure and function?

- A G is the cerebrum and is the site of reasoning and memory.
- B G is the cerebellum and is the site of reasoning and memory.
- C H is the medulla and controls muscle coordination.
- D H is the cerebellum and controls breathing and heart rate.

Questions 11 and 12 refer to the following flow diagram related to blood glucose regulation.



11. Which row in the table identifies organ X and hormone Y?

	<i>Organ X</i>	<i>Hormone Y</i>
A	Liver	Insulin
B	Liver	Glucagon
C	Pancreas	Insulin
D	Pancreas	Glucagon

12. Specialised cells allow organ Z to respond to hormone Y.
This is because the surface of the cells in organ Z have complementary

- A synapses
- B neurons
- C effectors
- D receptors.

[Turn over

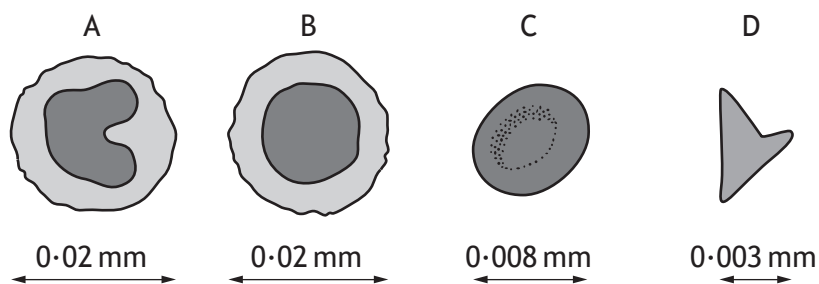
13. An **increase** in which of the following factors would **decrease** the rate of transpiration in plants?
- A Wind speed
 - B Humidity
 - C Surface area
 - D Temperature
14. Which of the following statements about blood cells is **false**?
- A White blood cells are part of the immune system.
 - B Phagocytes are a type of white blood cell.
 - C Red blood cells contain haemoglobin.
 - D Phagocytes transport nutrients around the body.
15. Which row in the table identifies how lymphocytes destroy pathogens?

	<i>Antibody production</i>	<i>Phagocytosis</i>
A	Yes	No
B	No	No
C	No	Yes
D	Yes	Yes

16. The following key can be used to identify the different components of blood.

- | | |
|-----------------------------------|-----------------------|
| 1. Nucleus absent | go to 2 |
| Nucleus present | go to 3 |
| 2. Diameter greater than 0.005 mm | red blood cell |
| Diameter less than 0.005 mm | platelet |
| 3. Nucleus is circular | lymphocyte |
| Nucleus is not circular | macrophage |

Use the key above to identify which of the diagrams represents a platelet.



17. Which of the following statements is true of villi?

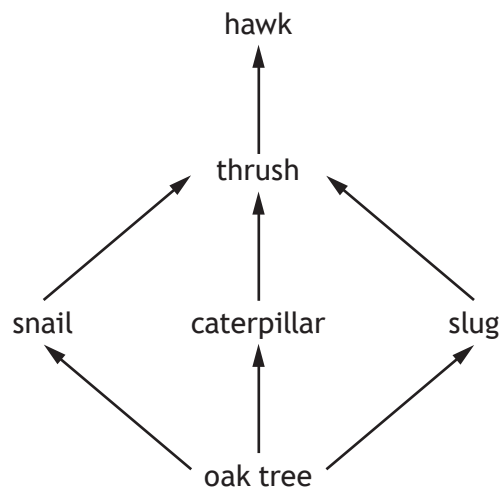
- A Blood capillaries absorb glycerol and amino acids.
- B Blood capillaries absorb glucose and fatty acids.
- C Lacteals absorb glycerol and fatty acids.
- D Lacteals absorb glucose and amino acids.

18. An ecosystem consists of abiotic factors plus a

- A community and its biodiversity
- B population and its biodiversity
- C population and its habitat
- D community and its habitat.

[Turn over

19. The diagram shows part of a food web.

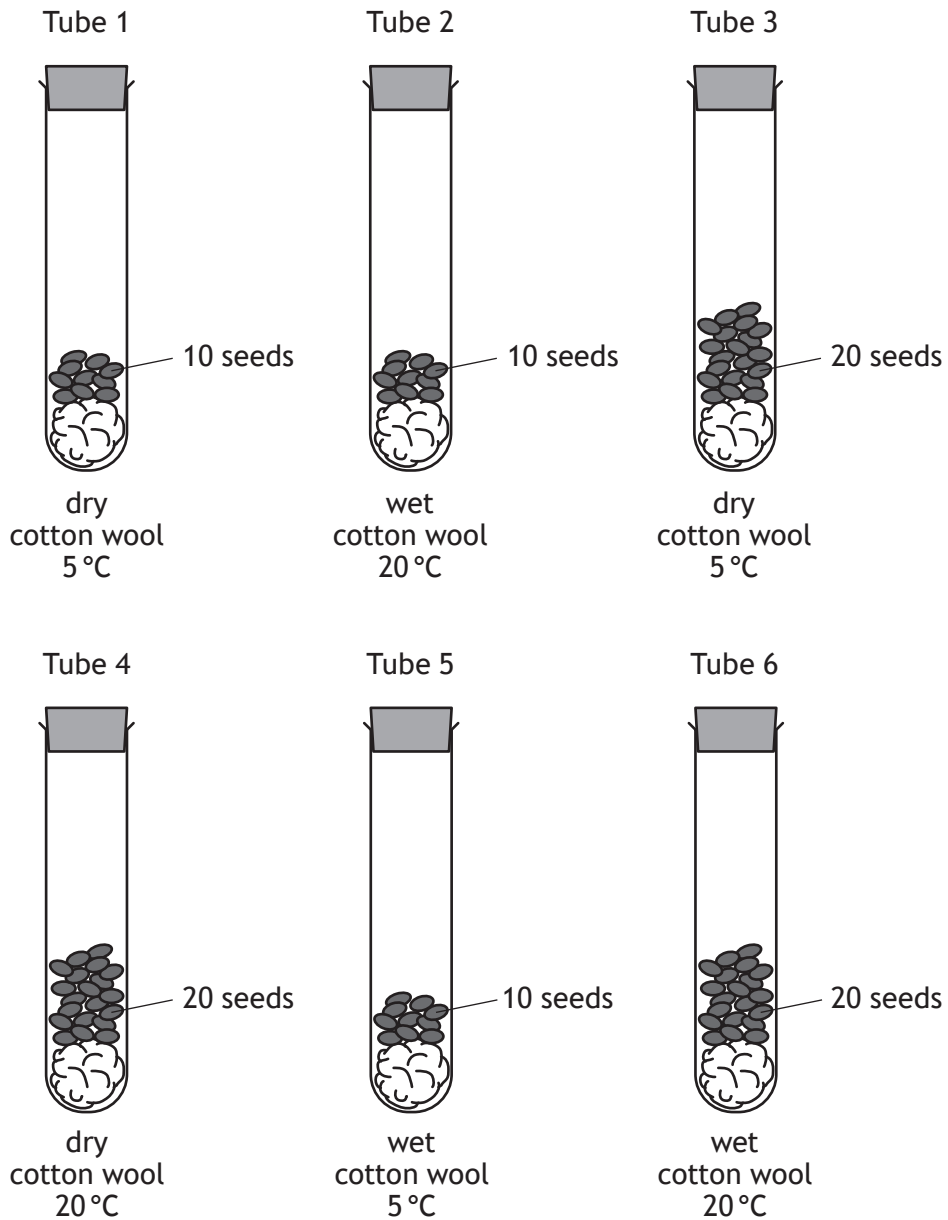


A chemical was used to control the number of slugs.

Which of the following could be a result of a large decrease in slug numbers?

- A An increase in snails.
- B An increase in hawks.
- C A decrease in caterpillars.
- D A decrease in oak trees.

20. The diagrams show an investigation into seed germination.

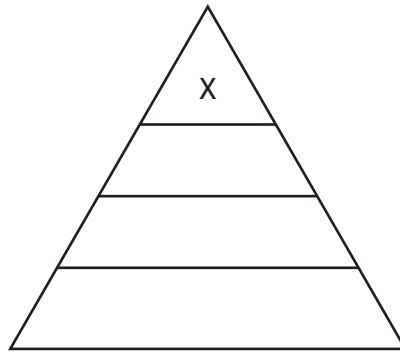


For a valid conclusion to be drawn, which two tubes should be compared to show the effect of temperature on germination?

- A 1 and 3
- B 3 and 6
- C 2 and 5
- D 4 and 6

[Turn over

21. The diagram represents a pyramid of energy.



There is less energy at level X in the pyramid because

- A there are fewer organisms at each level in the food chain
- B the organisms at level X are very small
- C energy is lost at each level in the food chain
- D energy is stored in each level and not passed on.

22. Mutations result in changes to genetic material.

Which of the following is **not** true of mutations?

- A Radiation can increase their rate.
- B They always have a harmful effect.
- C Genetic material is affected at random.
- D New alleles may be produced.

23. Natural selection occurs when there are selection pressures.

Which of the following could be a result of selection pressures?

- A Organisms with favourable alleles survive and reproduce.
- B Organisms with new alleles always have an advantage.
- C All alleles in a population increase in frequency.
- D All alleles in a population decrease in frequency.

24. Pesticides sprayed onto crops can get into food chains. The following statements refer to stages in this process.

- J Pesticides are absorbed by plants.
- K Pesticides build up in animals.
- L Plants are eaten by animals.

Identify the order of steps by which pesticides could reach lethal levels in the bodies of animals.

	<i>Step 1</i>	<i>Step 2</i>	<i>Step 3</i>
A	J	K	L
B	L	J	K
C	L	K	J
D	J	L	K

25. Which row in the table identifies biotic and abiotic factors which can affect a population?

	<i>Biotic factors</i>	<i>Abiotic factors</i>
A	grazing and predation	pH and temperature
B	predation and temperature	pH and grazing
C	pH and temperature	grazing and predation
D	pH and grazing	predation and temperature

[END OF SECTION 1. NOW ATTEMPT THE QUESTIONS IN SECTION 2 OF YOUR QUESTION AND ANSWER BOOKLET.]

[BLANK PAGE]

DO NOT WRITE ON THIS PAGE

[BLANK PAGE]

DO NOT WRITE ON THIS PAGE

[BLANK PAGE]

DO NOT WRITE ON THIS PAGE