National Qualifications 2017

X707/75/02

Biology
Section 1 — Questions

TUESDAY, 23 MAY

1:00 PM – 3:00 PM

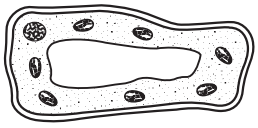
Instructions for the completion of Section 1 are given on *Page 02* of your question and answer booklet X707/75/01.

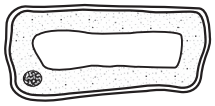
Record your answers on the answer grid on *Page 03* of your question and answer booklet.

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.

SECTION 1

1. The following diagrams represent three different cells.

P 

Q 

R 

Identify the plant cell(s).

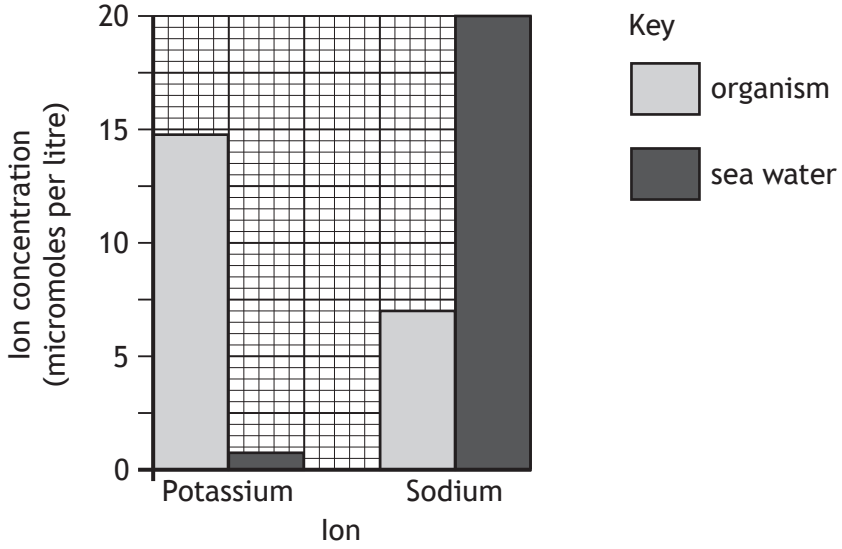
A P and R only

B P and Q only

C P only

D R only

2. The graph shows the concentrations of ions in a single-celled organism and the sea water surrounding it.



Use the graph to identify which of the following statements is correct.

A Sodium ions will move into the organism by active transport.

B Sodium ions will move out of the organism by diffusion.

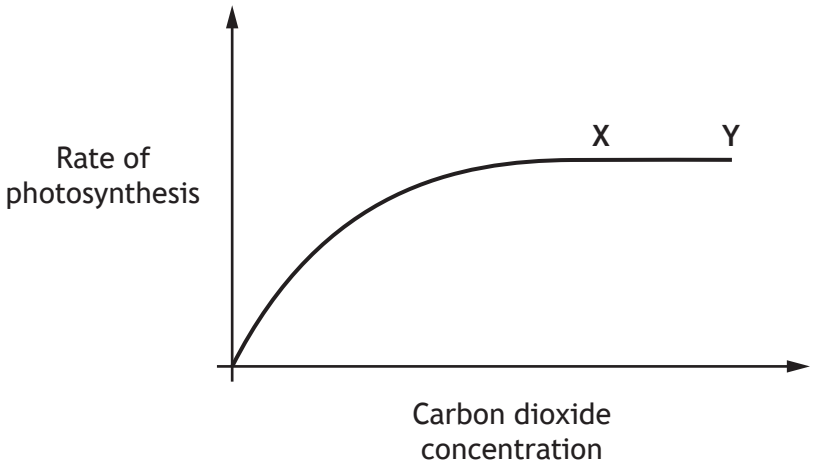
C Potassium ions will move out of the organism by active transport.

D Potassium ions will move into the organism by active transport.

3. Which row in the table identifies the order of stages involved in genetic engineering?

	Stage in Genetic Engineering			
	1st	2nd	3rd	4th
A	Required gene identified	Gene and plasmid extracted	Gene inserted into plasmid	Modified cells grown
B	Required gene identified	Gene inserted into plasmid	Gene and plasmid extracted	Modified cells grown
C	Gene inserted into plasmid	Required gene identified	Modified cells grown	Gene and plasmid extracted
D	Gene inserted into plasmid	Modified cells grown	Gene and plasmid extracted	Required gene identified

4. The graph shows the effect of increasing carbon dioxide concentration on the rate of photosynthesis.



Two factors which could be limiting the rate of photosynthesis between points **X** and **Y** on the graph are

A starch concentration and light intensity

B temperature and light intensity

C temperature and carbon dioxide concentration

D sugar concentration and carbon dioxide concentration.

[Turn over

5. Which row in the table describes a process in plants which requires sugar and a substance into which sugar is converted?

	Process	*Substance*
A	Photosynthesis	Cellulose
B	Respiration	Starch
C	Photosynthesis	Protein
D	Respiration	ATP

6. What is the difference in the number of ATP molecules produced per glucose molecule by fermentation compared to aerobic respiration?

A 2

B 36

C 38

D 40

7. Which of the following shows terms listed in order of increasing level of organisation in a multicellular organism?

A organ → tissue → system

B organ → system → tissue

C tissue → system → organ

D tissue → organ → system

8. Stem cells are

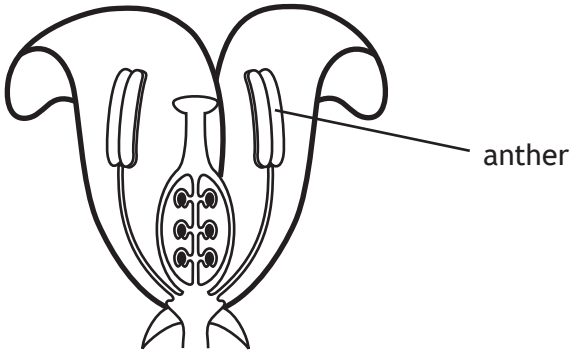
A specialised cells which can divide to produce new stem cells

B specialised cells which are unable to divide to produce new stem cells

C non-specialised cells which can divide to produce new stem cells

D non-specialised cells which are unable to divide to produce new stem cells.

9. The diagram shows the main parts of a flower.



Which row in the table describes the type of gametes produced by the anther and the chromosome complement these gametes contain?

	Type of gamete produced	*Chromosome complement*
A	female	diploid
B	male	diploid
C	female	haploid
D	male	haploid

10. Which of the following shows the passage of water through the tissues when it enters a plant?

A root hair ⟶ xylem ⟶ spongy mesophyll

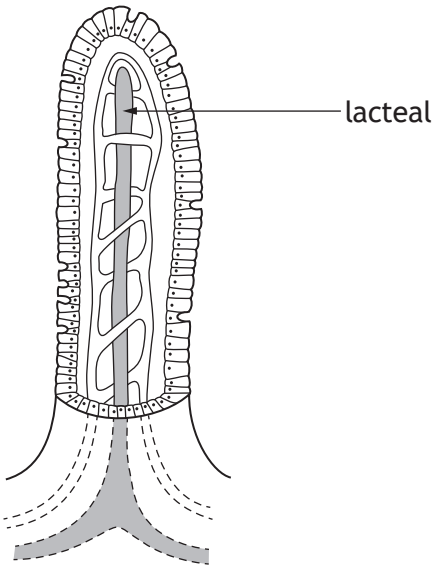
B root hair ⟶ spongy mesophyll ⟶ xylem

C spongy mesophyll ⟶ xylem ⟶ root hair

D xylem ⟶ spongy mesophyll ⟶ root hair

[Turn over

11. The diagram shows a villus from the small intestine.



Which of the following products of digestion are both absorbed into the lacteal?

A Glycerol and fatty acids
B Glucose and fatty acids
C Glycerol and amino acids
D Glucose and amino acids

12. The process which moves food along the digestive system is called

A diffusion
B absorption
C peristalsis
D osmosis.

13. Regular physical activity can help reduce the risk of heart disease.

The table shows the percentage of males and females of different age groups, who meet the weekly recommendations for physical activity.

	Percentage meeting the weekly recommendations for physical activity	
Age group	*Males*	*Females*
16–24	83	68
25–34	75	65
35–44	74	67
45–54	69	64
55–64	61	53

Which of the following statements is **not** correct for this data?

A The percentage of males meeting the weekly recommendations always decreases as age increases.

B The percentage of females meeting the weekly recommendations always decreases as age increases.

C 26% of males aged 35–44 do not meet the weekly recommendations.

D 35% of females aged 25–34 do not meet the weekly recommendations.

14. An example of a biotic factor affecting a population of plants is

A a leaf disease reducing the growth of lettuce plants

B acidic soil preventing the growth of daisies

C shade from buildings causing a decrease in the growth of grass

D a cold winter causing a decrease in the growth of geranium plants.

[Turn over

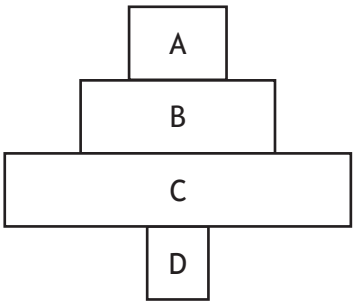
15. Which of the following statements is true of predation?

A It is an abiotic factor and causes a decrease in prey numbers.
B It is an abiotic factor and causes an increase in prey numbers.
C It is a biotic factor and causes a decrease in prey numbers.
D It is a biotic factor and causes an increase in prey numbers.

16. On average, 90% of energy is lost at each energy transfer in a food chain.
Which of the following is a cause of this energy loss?

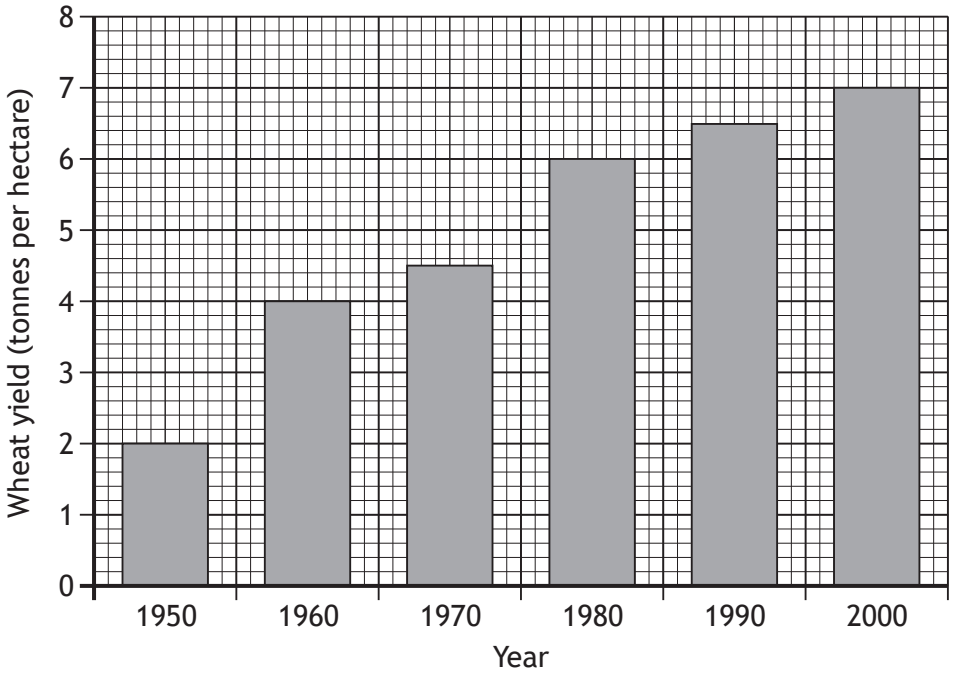
A Digested material
B Cell repair
C Movement
D Growth

17. The diagram below shows a pyramid of numbers.



Which letter represents the producer?

18. The following graph shows the changes in wheat yield over a fifty-year period.



The percentage increase in wheat yield from 1950 to 2000 is

A 5

B 40

C 250

D 350.

19. Which row in the table describes a type of competition and a matching example?

	Type of competition	*Example*
A	Interspecific	Two birch trees growing close together in a wood
B	Interspecific	Lions and hyenas feeding on zebra
C	Intraspecific	Seals and dolphins feeding on small fish
D	Intraspecific	Buttercups and daisies growing in the same field

[Turn over

20. The following paired statement key can be used to identify invertebrate groups.

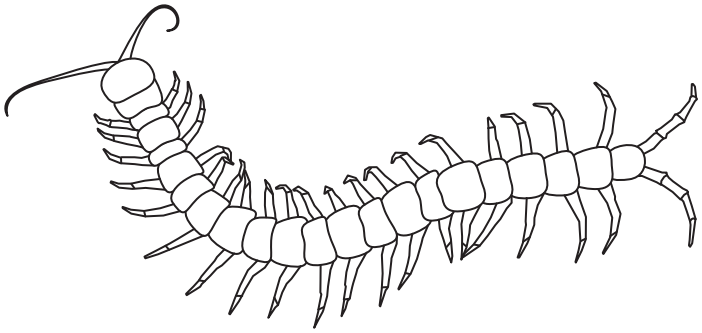
1. Six legs..... *Hexapoda*
   More than six legs..... go to 2

2. 8 legs ..... go to 3
   More than 8 legs ..... go to 4

3. Curved sting ..... *Dromopoda*
   No curved sting ..... *Arachnida*

4. 1 pair of legs per body segment..... *Chilopoda*
   2 pairs of legs per body segment ..... *Diplopoda*

Use the key to identify the invertebrate group to which the following organism belongs.



A Dromopoda
B Arachnida
C Chilopoda
D Diplopoda

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

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