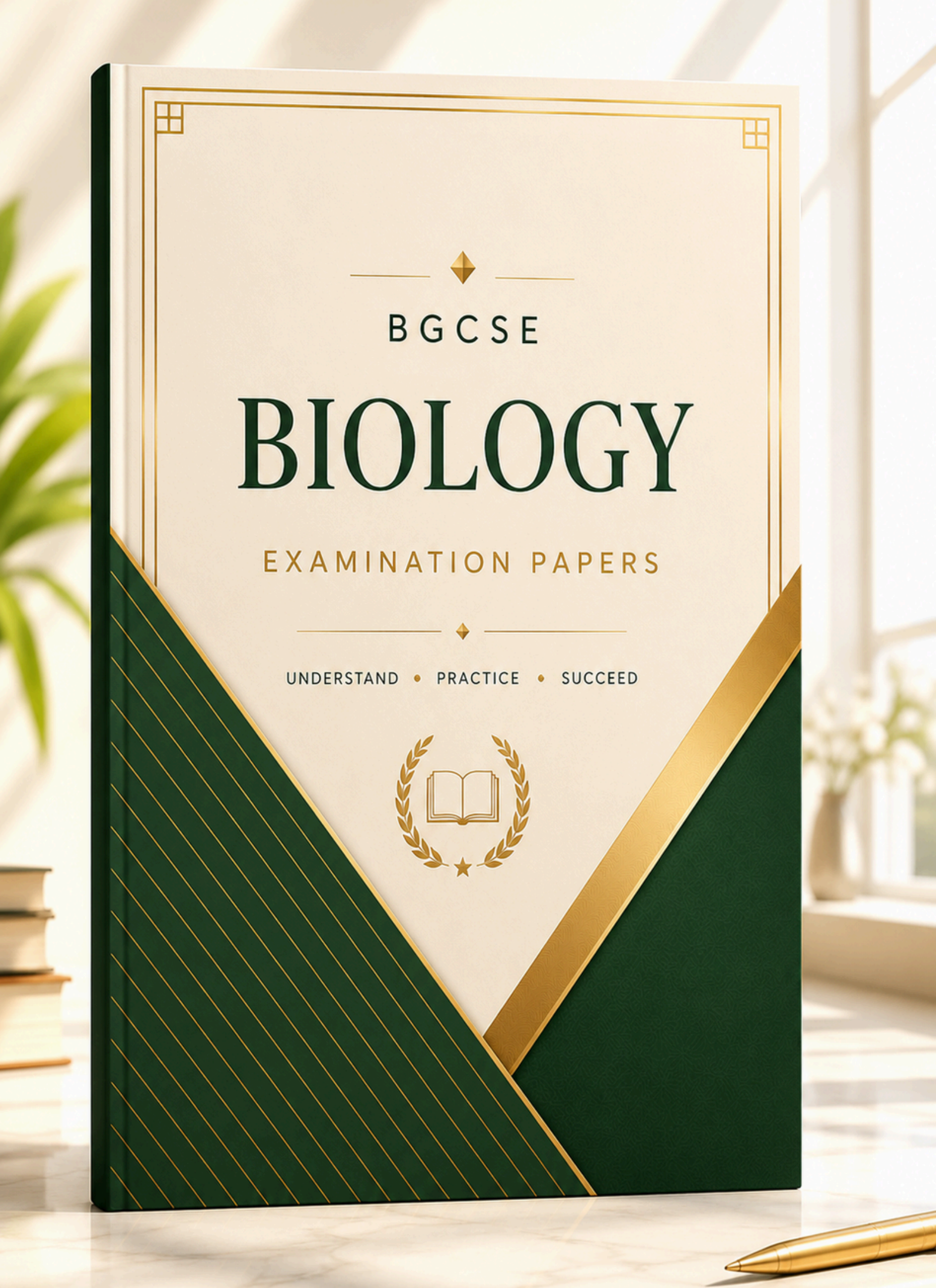
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3009/1 **BGCSE**

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PAPER 1 3009/1

Tuesday 8 JUNE 2021 9:00A.M.–10:15A.M.

MINISTRY OF EDUCATION
NATIONAL EXAMINATIONS

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS AND INFORMATION FOR CANDIDATES

Do not open this booklet until you are told to do so.

Write your school number, candidate number, surname and initials in the spaces provided above.

There are fifty questions on this paper.

Answer **ALL** questions.

For each question, there are four possible answers labelled **A, B, C** and **D.**

Choose the **one** you consider correct and circle the **LETTER** of your choice in the booklet.

This question paper consists of 23 printed pages and 1 blank page.

PAPER 1

1. The classification of one species of grasshopper is as follows:

Kingdom:	*Animalia*
Phylum:	*Arthropoda*
Class:	*Insecta*
Order:	*Orthoptera*
Family:	*Acrididae*
Genus:	*Schistocerca*
Species:	*Americana*

What is the binomial name for this species of grasshopper?

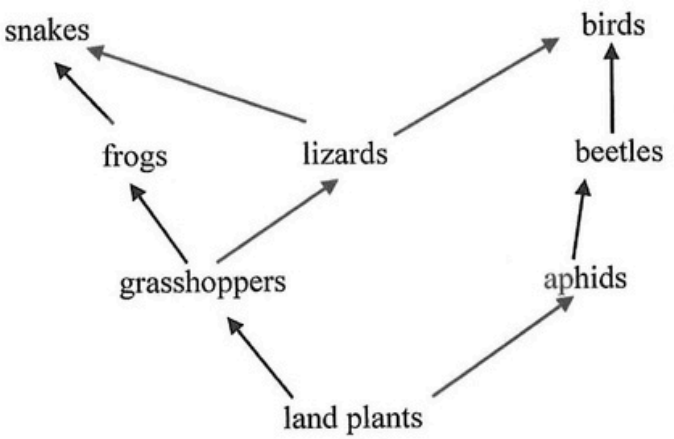
A Animalia americana

B Insecta orthoptera

C Orthoptera schistocerca

D Schistocerca americana

2. The diagram shows a food web.



Which is an example of an organism that occupies the third trophic level?

A beetles

B birds

C grasshoppers

D snakes

3. How do omnivores obtain the complex molecules they need to live and grow?

A by feeding on consumers only

B by feeding on consumers and producers

C by manufacturing them all from simple molecules

D by feeding on producers only

4. Which of the following is a biotic factor in the environment?

A rainfall

B plant life

C temperature

D soil type

5. Which type of Mangrove is found growing mainly in the low tide zone?

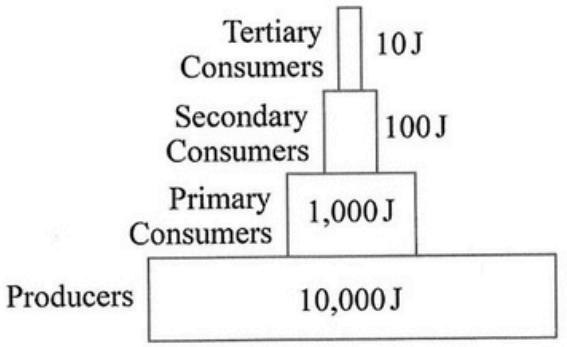
A Buttonwood

B Black Mangrove

C Red Mangrove

D White Mangrove

6. The table shows the energy input into each trophic level within a particular ecosystem in one year.



Which statement correctly describes an energy transfer shown in the pyramid of energy?

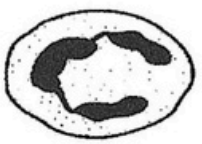
A 10% of the energy is transferred up from producer to primary consumer.

B 10% of the energy is transferred up from producer to secondary consumer.

C 10% of the energy is transferred up from producer to tertiary consumer.

D 10% of the energy is transferred from primary consumer to producers.

7. The cell shown in the diagram has been magnified 3000 times. The diagram is 21 mm wide.



What is the actual diameter of the cell?

A 21 mm

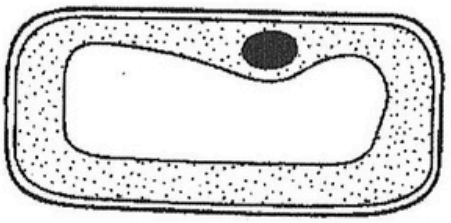
B $\frac{21}{3000}$ mm

C 21×3000 mm

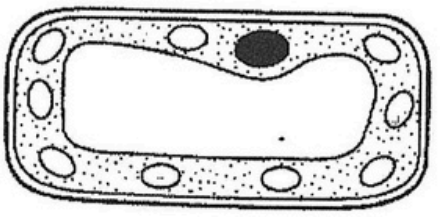
D $\frac{3000}{21}$ mm

8. The diagram shows two plant cells, **P** and **Q**.

cell **P**



cell **Q**



How does cell **P** differ from cell **Q**?

A Cell **P** has no cell wall.

B Cell **P** has no chloroplasts.

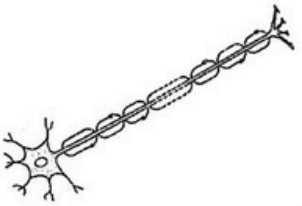
C Cell **P** has no nucleus.

D Cell **P** has no vacuole.

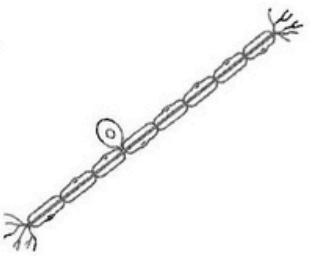
9. Which diagram shows a sensory neuron?

A

B

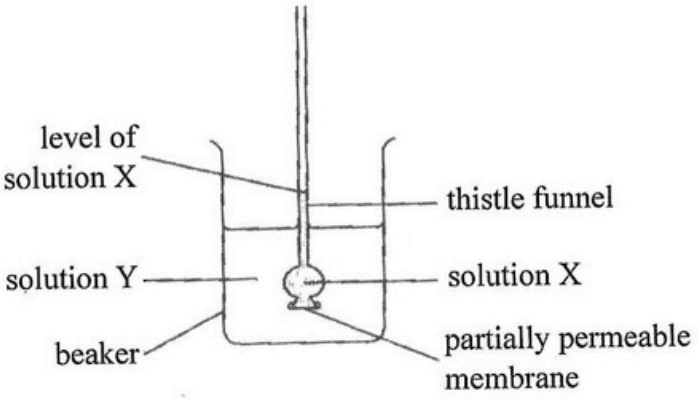


C



D

10. An experiment was set up to demonstrate a process which occurs in living organisms.



After 30 minutes the level in the thistle funnel was higher. What does this show?

A Solution **X** is more concentrated than solution **Y**.

B Solution **X** and solution **Y** are of equal concentrations.

C Solution **X** is a dilute solution and solution **Y** is a concentrated solution.

D The solute diffuses from solution **Y** to solution **X**.

11. Some plant cells are placed in a solution with a higher concentration than that of the cells. Which row is correct?

	movement of water by osmosis	**volume of vacuole**
A	enters cells	decreases
B	enters cells	increases
C	leaves cells	decreases
D	leaves cells	increases

12. Which enzyme breaks down starch?

A amylase

B lipase

C protease

D trypsin

13. What colour would be expected if two pieces of fish were tested separately using the Benedict's test and biuret test?

	Benedict's test	**biuret test**
A	blue	violet
B	blue-black	blue
C	blue-black	violet
D	orange-brown	violet

14. 1 g of carbohydrate provides 16 kJ of energy in the body.

1 g of protein provides 17 kJ of energy in the body.

100 g of a food contains 50 g of carbohydrate, 10 g of protein and no fat.

How much energy is provided by 100 g of this food?

A 33 kJ

B 60 kJ

C 800 kJ

D 970 KJ

15. Which row correctly matches parts of the digestive system and associated organs with their functions?

	digestion	**absorption**	**assimilation**
A	oesophagus	small intestine	liver
B	oesophagus	large intestine	liver
C	stomach	small intestine	liver
D	pancreas	large intestine	pancreas

16. Which substance is secreted into the small intestine?

A bile

B hydrochloric acid

C saliva

D pepsin

17. A woman selects a meal for lunch. Which selection, on its own, would provide the closest match to a balanced diet?

A chicken souse, Johnny cake and coffee

B turkey sandwich, chips and soda

C fried chicken, macaroni and water

D meatloaf, garden salad and milk

18. The word equation for photosynthesis is given below.

carbon dioxide + water ⟶ glucose + oxygen

What conditions are needed for photosynthesis to take place?

A chlorophyll and light

B chlorophyll and cytoplasm

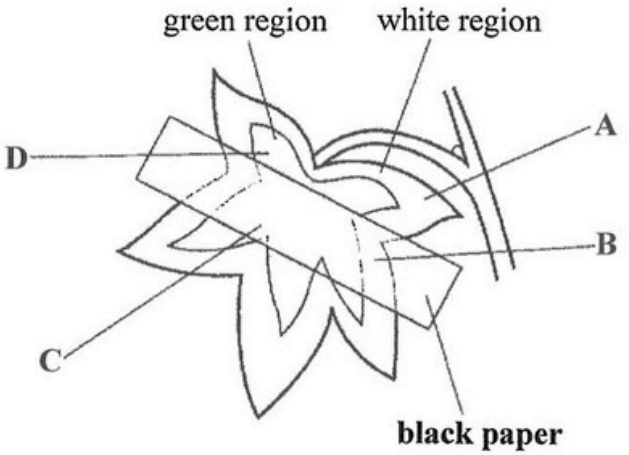
C cytoplasm and heat

D cytoplasm and light

19. A plant with variegated leaves has the starch removed from its leaves by placing it in a dark cupboard for 48 hours.

Black paper is then fixed on one leaf as shown and the plant is exposed to light.

After 24 hours, which part of the leaf contains starch?



20. Which substances are transported in the phloem?

A amino acids and starch

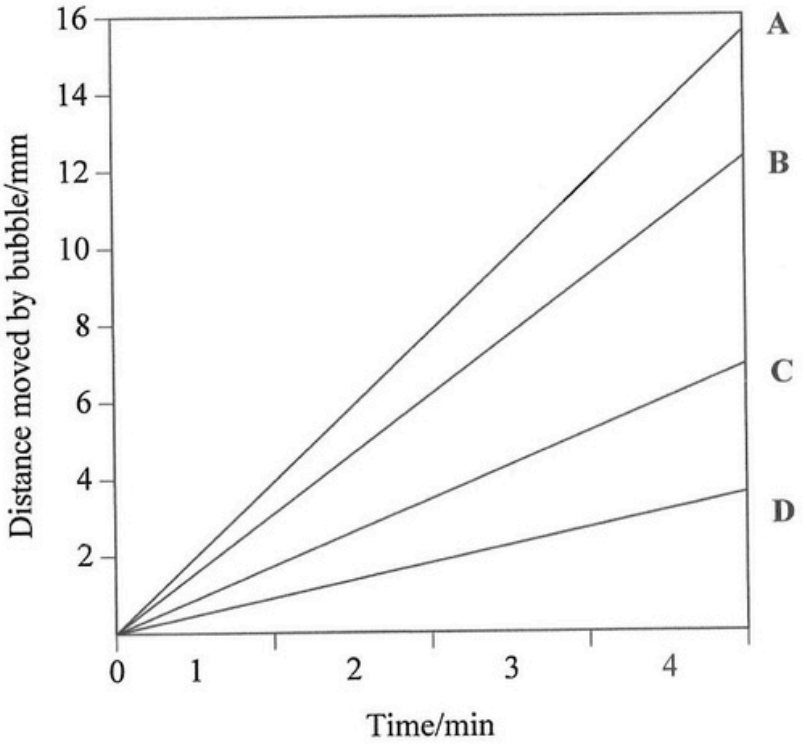
B amino acids and sucrose

C protein and starch

D starch and sucrose

21. Four plants were set up to investigate the rate of transpiration using a potometer.

In which plant did most transpiration occur?



22. Which process, inside cells, releases energy useful to the human body?

A digestion

B excretion

C ingestion

D respiration

23. What **two** features of an alveolus aid in gaseous exchange?

A dry surface and wall is one cell thick

B dry surface and associated with many capillaries

C moist surface and associated with few capillaries

D moist surface and wall is one cell thick

24. Which blood vessel, if it were to become blocked, could lead **directly** to a heart attack?

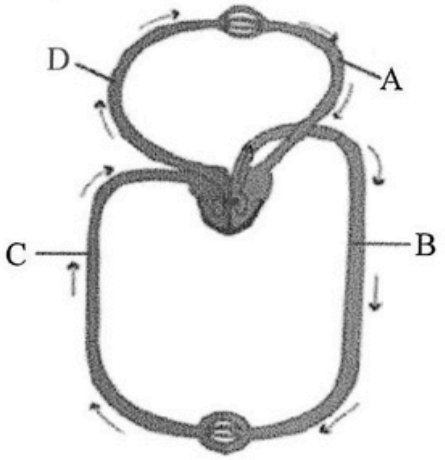
A coronary artery

B pulmonary artery

C pulmonary vein

D vena cava

25. The diagram shows a double circulatory system.



Which vessels carry oxygenated blood?

A A and B

B A and D

C B and C

D C and D

26. Which group contains substances that are **all** carried around the body dissolved in the plasma?

A amino acids, carbon dioxide and glycogen

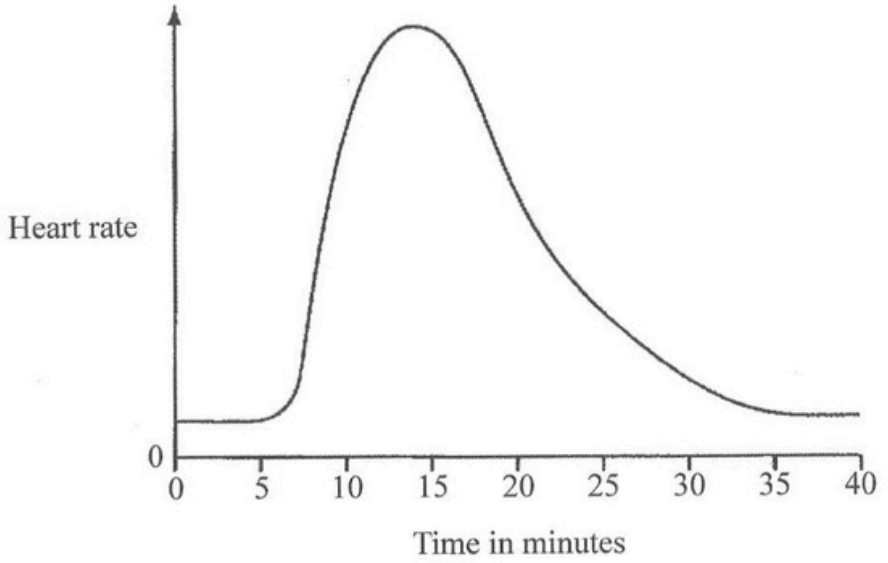
B glucose, glycogen and lactic acid

C oestrogen, oxygen and glycogen

D salts, insulin and urea

27. The graph shows the effect of several minutes of vigorous exercise on heart rate.

How long did it take the individual to recover from this vigorous exercise?



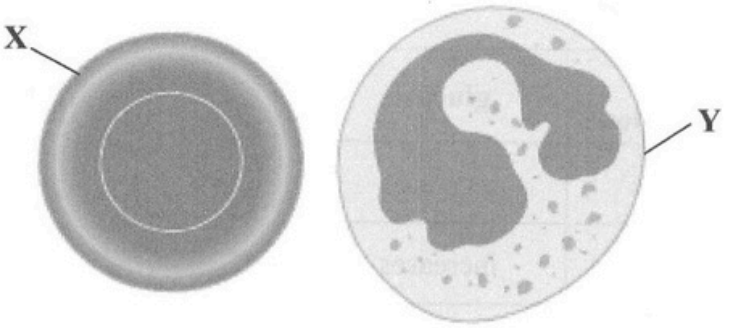
A 20 minutes

B 30 minutes

C 35 minutes

D 40 minutes

28. The diagram shows two blood cells, **X** and **Y**.



What are the functions of cell **X** and cell **Y**?

	cell X	**cell Y**
A	carries out phagocytosis	carries oxygen
B	carries oxygen	produces antibodies
C	carries oxygen	carries carbon dioxide
D	produces antibodies	carries oxygen

29. What is the main function of sweating in the human body?

A to clean the pores

B to cool the body

C to excrete urea

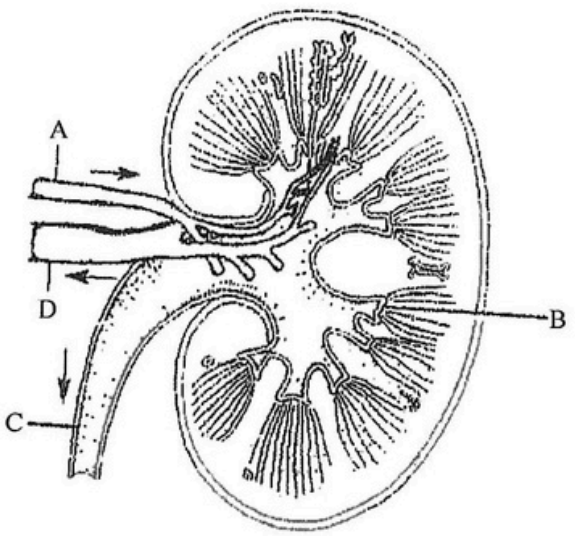
D to remove excess salts

30. Which row in the table shows the effects of eating a meal containing carbohydrates on the concentration of insulin and glucose in the blood?

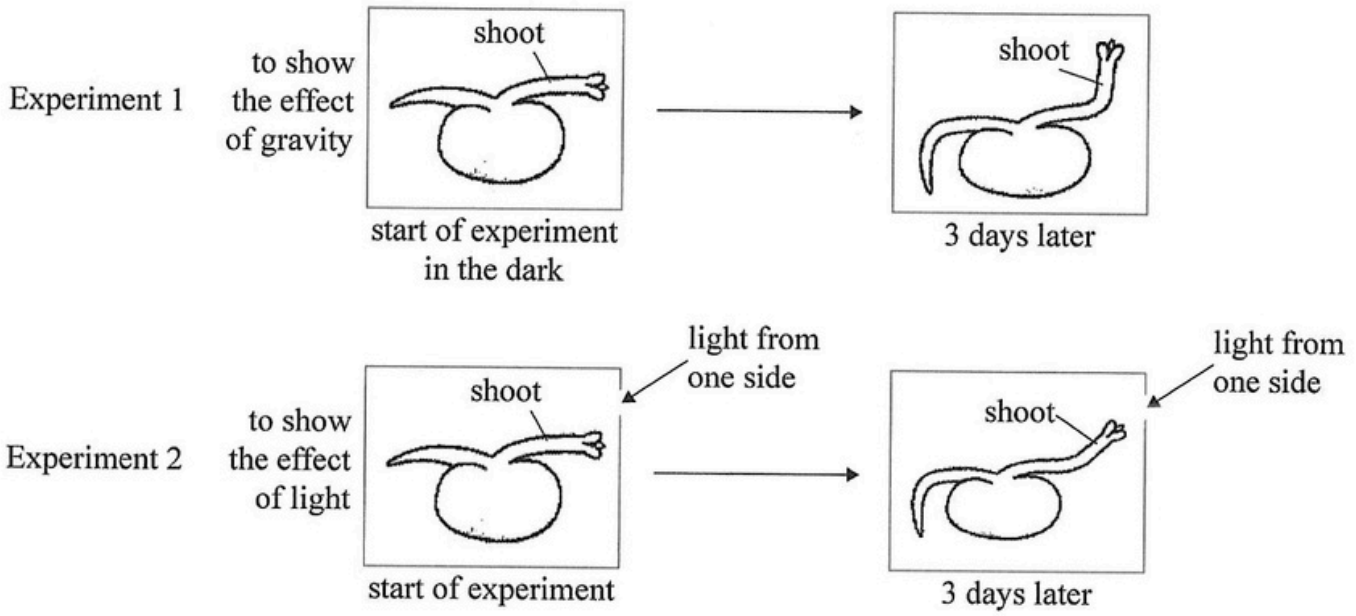
	insulin concentration	**glucose**
A	decreases	increases
B	increases	increases
C	decreases	decreases
D	increases	decreases

31. The diagram shows a section through a human kidney.

Which structure contains the lowest concentration of urea?



32. The diagram shows shoots in two experiments on the tropic response of a shoot to gravity and light.



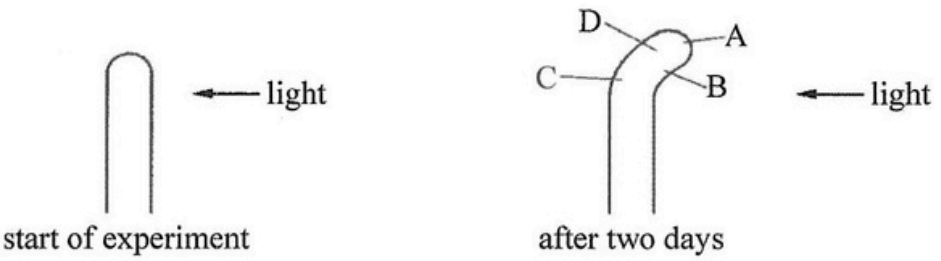
How have the seedlings responded?

KEY: ✓ = positive response; ✗ = negative response

	to gravity	to light
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

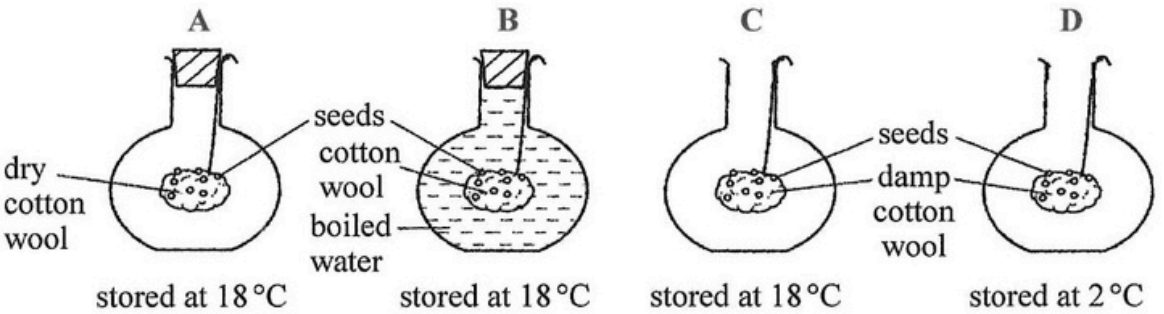
33. In an experiment to investigate phototropism, a plant shoot is grown with light coming from one side only.

After two days, in which region has the greatest rate of growth occurred?



34. The diagram shows four flasks which were set up to investigate the conditions needed for germination.

In which flask will the seeds germinate most quickly?



35. The table lists some processes which take place during reproduction in flowering plants and mammals.

Which row is correct?

	fertilisation needed	**implantation needed**	**pollination needed**
A	flowering plants and mammals	mammals only	flowering plants only
B	flowering plants and mammals	flowering plants and mammals	mammals only
C	mammals only	mammals only	flowering plants only
D	flowering plants and mammals	mammals only	flowering plants and mammals

36. Which hormone is responsible for ovulation?

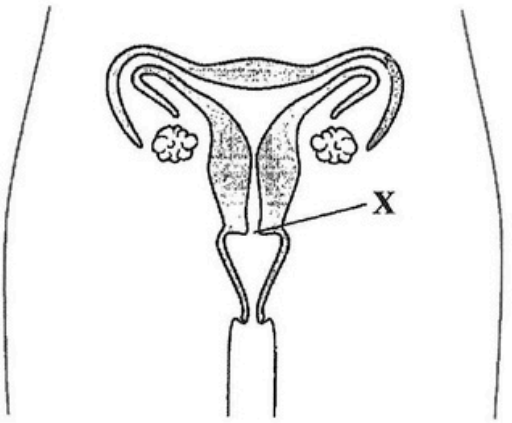
A oestrogen

B follicle stimulating hormone

C luteinizing hormone

D testosterone

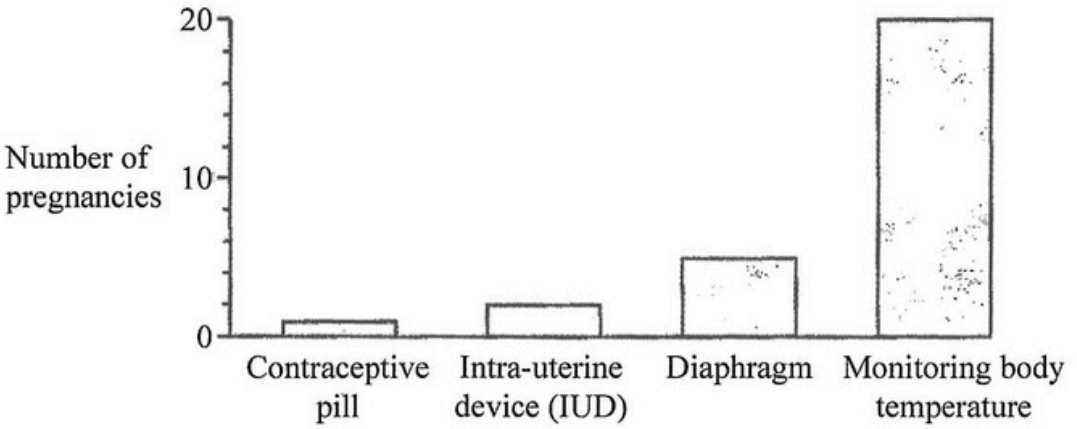
37. The diagram shows the female reproductive system of a human.



What is the name of structure **X**?

A cervix
B ovary
C uterus
D vagina

38. The bar chart shows the number of pregnancies in four groups of 100 women over the same period. Each group used a different type of birth control.



Which statement about the bar chart is correct?

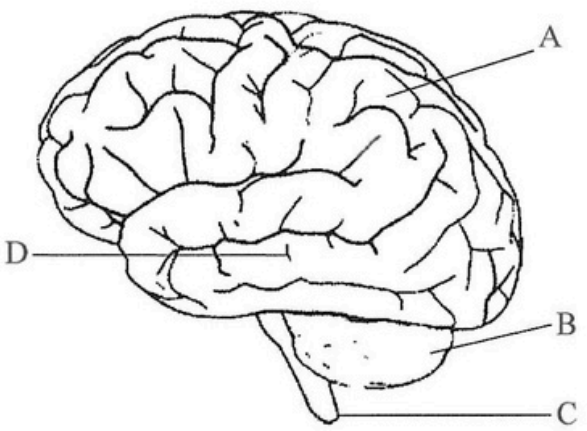
A The least effective of the four types of birth control is a chemical method.

B The least effective of the four types of birth control is a mechanical method.

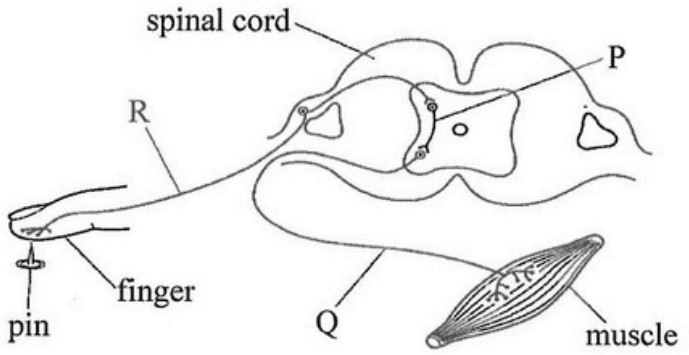
C The least effective of the four types of birth control is a natural method.

D The least effective of the four types of birth control is a surgical method.

39. The diagram shows the human brain. Which area is responsible for coordinating movement?



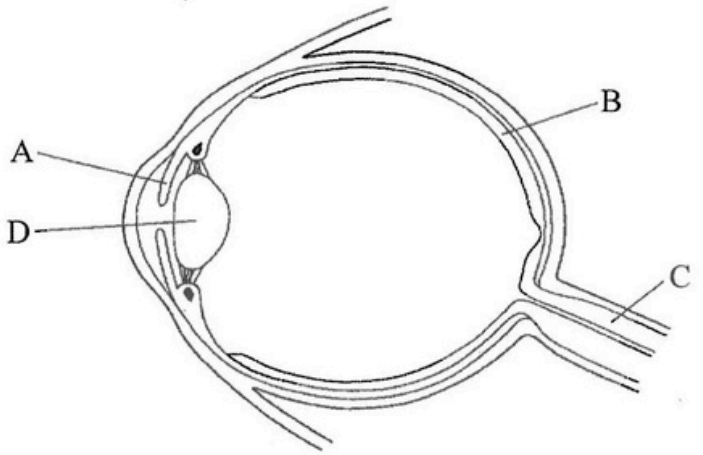
40. The diagram represents a simple reflex arc.



What sequence of neurons does a nerve impulse pass through during a reflex action?

	first ⟶ **last**		
A	R	Q	P
B	Q	R	P
C	Q	P	R
D	R	P	Q

Questions 41 and 42 refer to the diagram of the eye below.



41. Which labelled structure contains receptors that respond to light?

A structure A

B structure B

C structure C

D structure D

42. Which labelled structure is affected by the process of accommodation?

A structure A

B structure B

C structure C

D structure D

43. An animal has 36 chromosomes in each body cell. How many chromosomes in each body cell came from the male parent?

A 10

B 16

C 18

D 36

44. Which cell could be formed when a cell divides by meiosis?

A bone cell

B epithelial cell

C muscle cell

D sperm cell

45. Which term describes a length of DNA that controls a characteristic of an individual?

A gene

B mutation

C nucleic acid

D phosphate

46. What is expected to happen to the recessive trait when pure-breeding plants showing the dominant trait are crossed with pure-breeding plants showing the recessive trait?

A The recessive trait becomes dominant.

B The recessive trait is never expressed in subsequent generations.

C The recessive trait is expressed by some offspring in the first (filial) generation (F_1).

D The recessive trait is expressed by some offspring in the second (filial) generation (F_2).

47. The Punnett square shows the expected offspring genotypes from a cross between two parents.

BB	Bb
BB	Bb

What are the genotypes of the two parents?

A BB and BB

B BB and Bb

C Bb and Bb

D Bb and bb

48. What is one possible disadvantage of growing genetically modified crops compared to growing non-genetically modified crops?

A cheaper to produce

B greater nutritional value

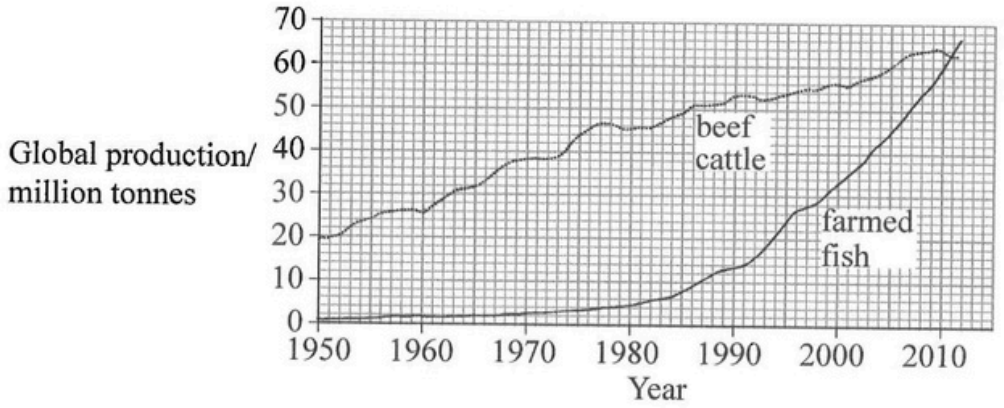
C greater risk of causing allergic reactions

D greater resistance to pests

Questions 49 and 50 refer to the information below.

Fish and beef cattle are farmed to provide a source of protein for humans.

The graph shows changes in the global production of farmed fish and beef cattle since 1950.



49. In 2012, some scientists predicted that the global production of farmed fish in 2020 would be six times greater than the global production of farmed fish in 1990.

What was the scientist's prediction for the global production of farmed fish in 2020?

A 80 million tonnes

B 82 million tonnes

C 84 million tonnes

D 86 million tonnes

50. What was the difference between the global production of beef cattle and the global production of farmed fish in the year 2000?

A 24 million tonnes

B 32 million tonnes

C 56 million tonnes

D 88 million tonnes

End]

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