

EXAMINATIONS COUNCIL OF ZAMBIA

**Joint Examination for the School Certificate
and General Certificate of Education Ordinary Level**

BIOLOGY

5090/1

PAPER 1 Multiple Choice

Tuesday

7 OCTOBER 2014

Additional materials:

Multiple Choice answer sheet

Soft clean eraser

Soft pencil (type B or HB is recommended)

TIME: 50 Minutes

INSTRUCTIONS TO CANDIDATES

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

Write your name, centre number and candidate number on the Answer Sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer all questions. For each question there are four possible answers: **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

Read very carefully the instructions on the Answer Sheet.

INFORMATION FOR CANDIDATES

Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this Question Paper.

Cell phones are not allowed in the examination room.

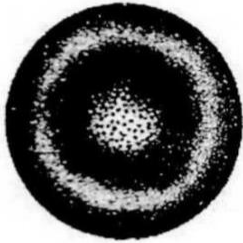
1 Which process is not carried out by all living organisms?

- A nutrition.
- B photosynthesis.
- C respiration.
- D reproduction.

2 The diagrams show four specialised cells, not drawn to scale.

Which of these cells can move on their own?

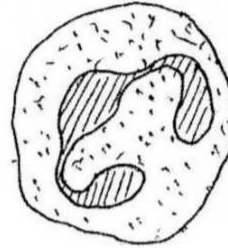
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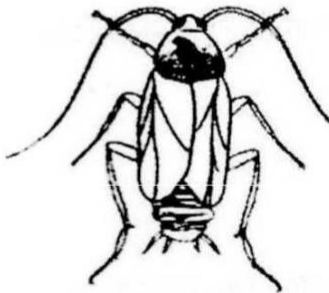
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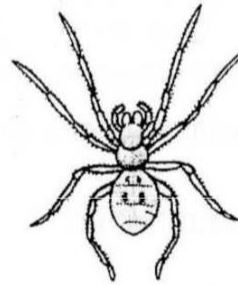
- A 1 and 2
- B 1 and 3
- C 2 and 3
- D 2 and 4

3 The diagrams below show two organisms belonging to the phylum Arthropoda.

X



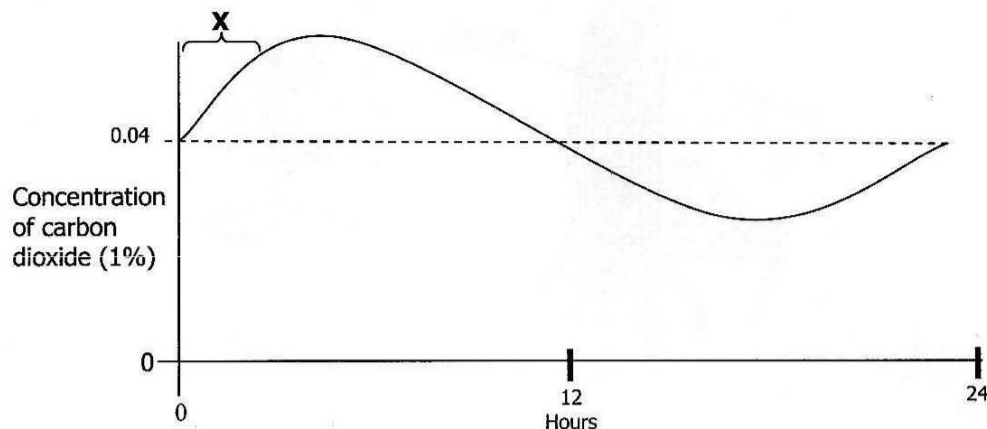
Y



To which classes do these organisms belong?

	Organism	Organism Y
A	Arachnida	Insectica
B	Arachnida	Anstacea
C	Insectica	Arachnida
D	Insectica	Crustacea

- 4 The graph shows the concentration of carbon dioxide in the air surrounding a plant measured over a period of 24 hours.



What explains the change in carbon dioxide concentration during the period marked X?

	Light intensity	Plant process
A	Darkness	Respiration
B	Darkness	Transportation
C	Daylight	Photosynthesis
D	Daylight	Respiration

- 5 What substances do plants make using nitrate ions?

KEY

- ✓ – nitrate used
X – nitrate not used

	Chlorophyll	Proteins	Glucose
A	✓	✓	X
B	✓	X	X
C	X	✓	✓
D	X	X	✓

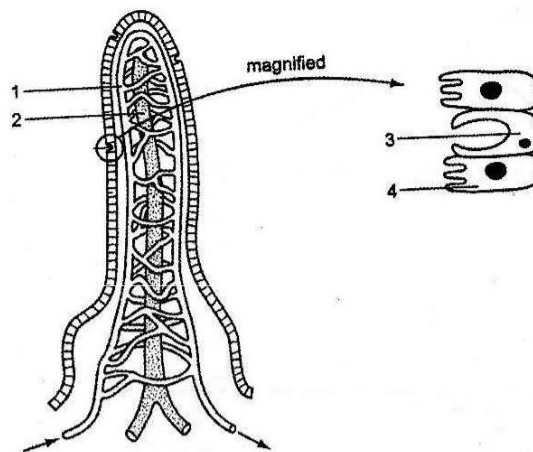
- 6 The table shows the results of testing foods. Which food is milk?

KEY

- ✓ – positive test
X – negative test

	Iodine test	Benedict's test	Buuret test
A	✓	X	✓
B	X	✓	X
C	✓	X	X
D	X	✓	✓

7 The diagram shows a section through a villus.



Which sequence correctly describes the functions of the numbered parts?

	1	2	3	4
A	Transports digested fats	Transports glucose	Absorbs digested food	Produces mucus
B	Transports digested fats	Transports glucose	Produces mucus	Absorbs digested food
C	Transports glucose	Transports digested fats	Absorbs digested food	Produces mucus
D	Transports glucose	Transports digested fats	Produces mucus	Absorbs digested food

8 The following is the dental formula of a carnivore $I \frac{3}{3}, C \frac{1}{1}, PM \frac{1}{2}, M \frac{1}{2}$

What is the total number of teeth in the mouth of this carnivore?

- A 7
- B 14
- C 28
- D 32

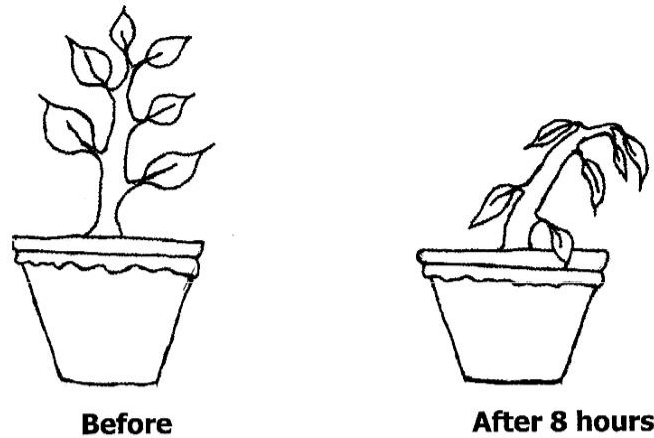
9 Which of the following are the functions of the xylem?

	Absorption	Conduction	Support
A	X	✓	✓
B	X	X	✓
C	✓	✓	X
D	✓	X	X

KEY

- ✓ – Correct function of xylem
- X – Not a function of xylem

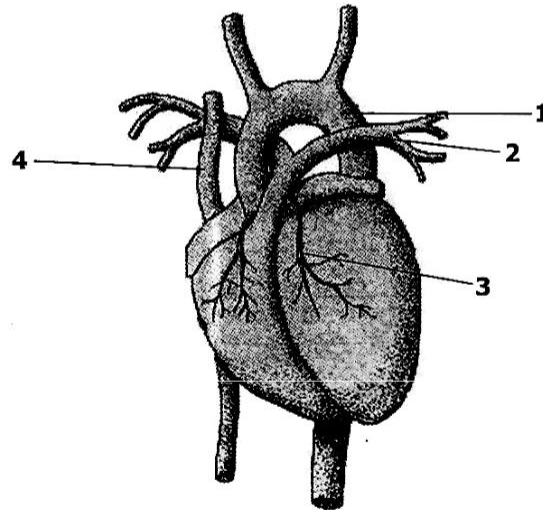
10 The diagram shows a potted plant which was left in open air for eight hours.



Which environmental conditions caused the change illustrated by the diagram?

	Temperature	Humidity	Light intensity
A	High	High	High
B	High	Low	High
C	Low	High	Low
D	Low	Low	Low

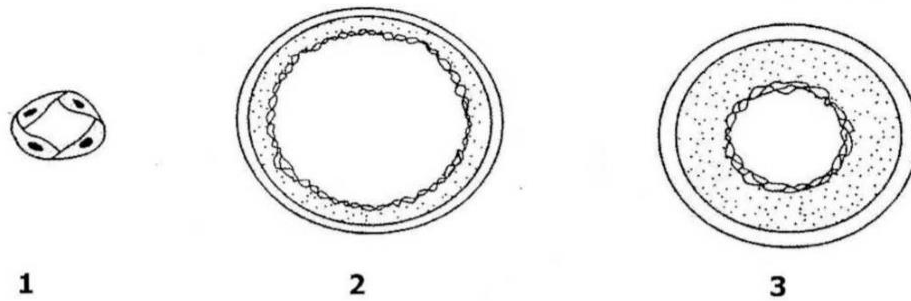
11 The diagram shows an external view of a mammalian heart.



What are the numbered structures?

	Aorta	Coronary artery	Pulmonary artery	Vena Cava
A	1	2	3	4
B	1	3	2	4
C	2	3	1	4
D	4	2	3	1

12 The diagrams show three blood vessels in transverse section.



In which order would blood flow through these vessels in passing from the heart through the lungs and back to the heart?

	From heart	Through lungs	To heart
A	1 →	2 →	3
B	2 →	3 →	1
C	3 →	1 →	2
D	3 →	2 →	1

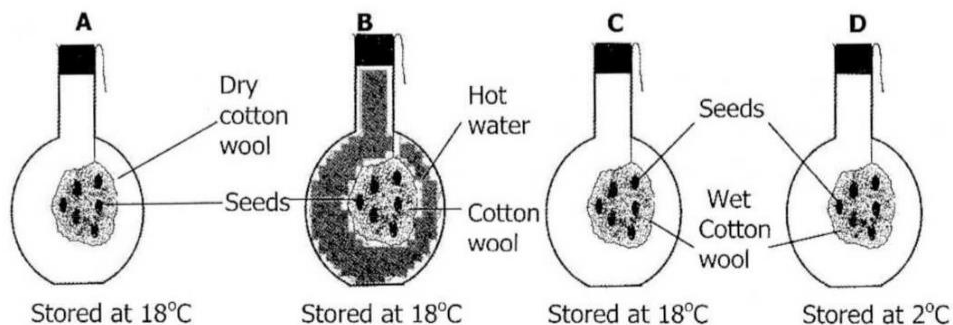
13 Which of the following processes do not use energy released by respiration?

- A Diffusion of carbon dioxide across alveolus wall.
- B Selective reabsorption of glucose from the glomerular filtrate.
- C Transmission of nerve impulses through neurones.
- D Uptake of potassium ions by root hair cells from the soil.

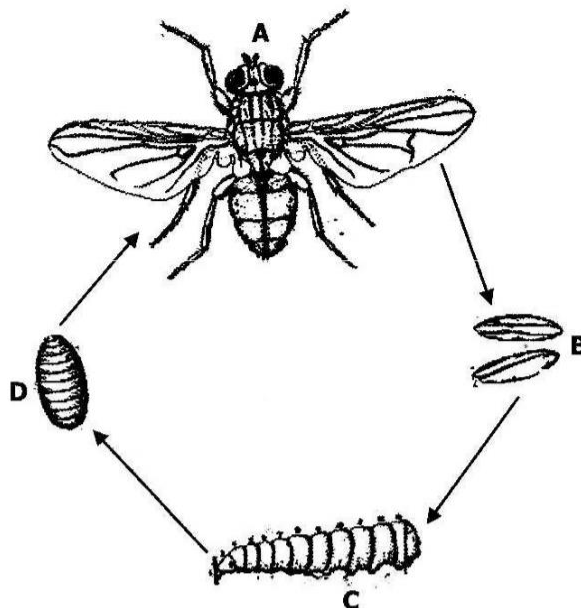
14 Three tests were carried out on expired and inspired air. Which results would occur for expired air?

	Air bubbled through lime water for 1 minute	Temperature of air in °C	Time seconds for a candle to be extinguished in the air
A	Becomes cloudy	35	3
B	Remains clear	35	20
C	Becomes cloudy	28	20
D	Remains clear	28	3

15 The diagram shows four flasks which were set up to investigate the conditions needed for germination. In which experiment will the seeds germinate most quickly?



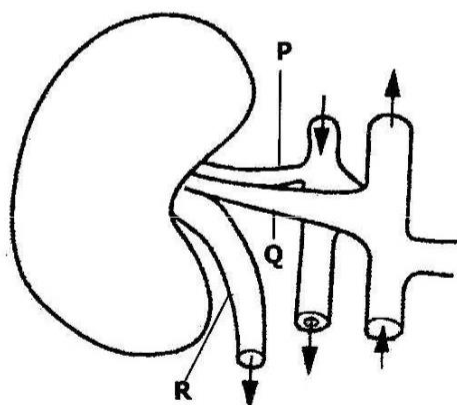
- 16 The diagram below shows the life cycle of a housefly. Which stage spreads the cholera pathogen?



- 17 What excretory products are eliminated through the seeds of groundnuts?

- A Anthocyanins.
- B Latex.
- C Lipids.
- D Resins

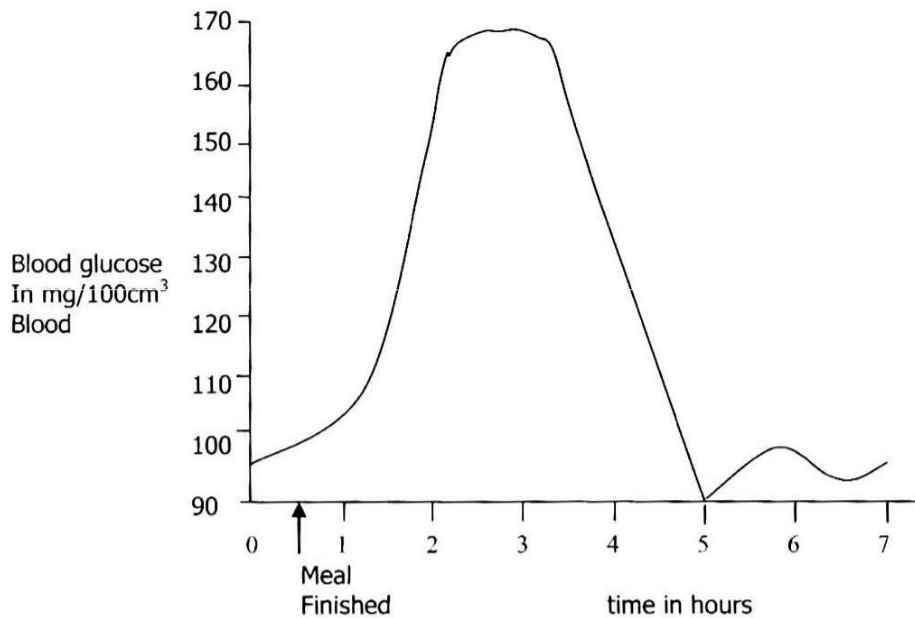
- 18 The diagram below shows the structures associated with a human kidney



What are the relative concentrations of urea in P, Q and R?

	P	Q	R
A	High	High	Low
B	High	Low	High
C	Low	Low	High
D	Low	High	Low

19 The graph shows the blood glucose concentration of a person after a meal rich in starch.

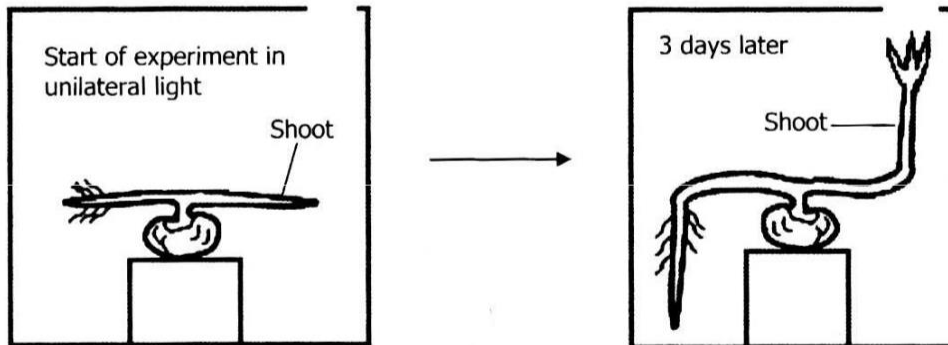


During which period after the meal would the secretion of glucagon begin to rise.

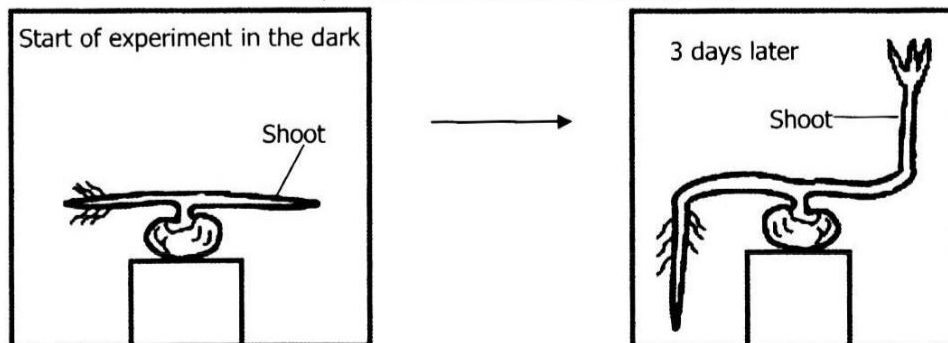
- A 1 - 2 hours
- B 2 - 3 hours
- C 3 - 4 hours
- D 5 - 6 hours

20 The diagrams show seedlings in an experiment on the tropic response of shoots to gravity and light.

Experiment to show the effect of light



Experiment to show the effect of gravity



How has the shoot responded?

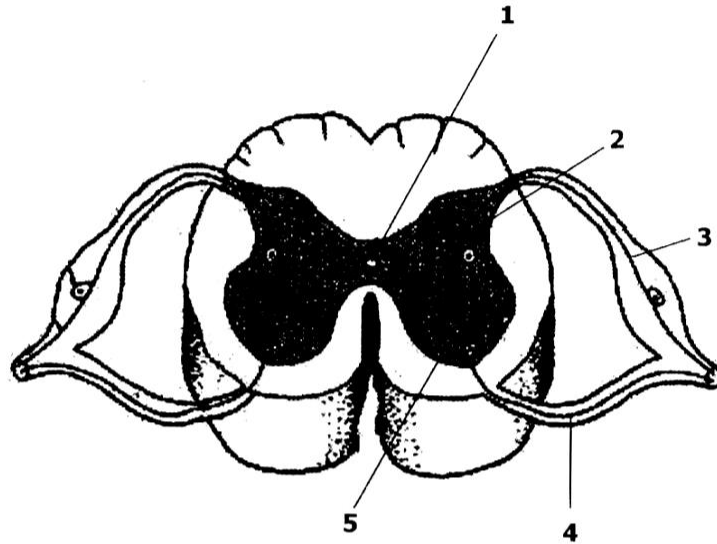
	To gravity	To light
A	✓	✓
B	✓	X
C	X	✓
D	X	X

Key:

✓ = Tropic response shown

X = no tropic response shown

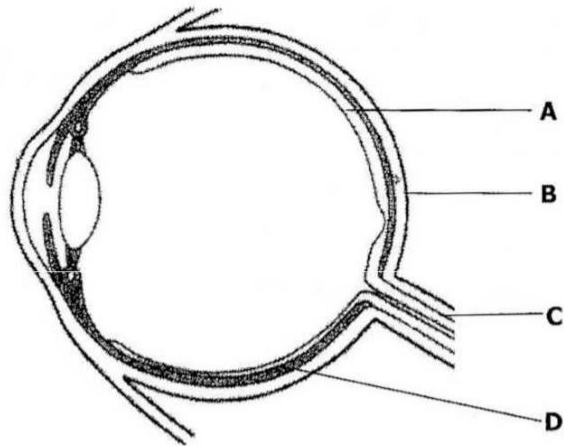
21 The diagram shows part of a spinal reflex arc.



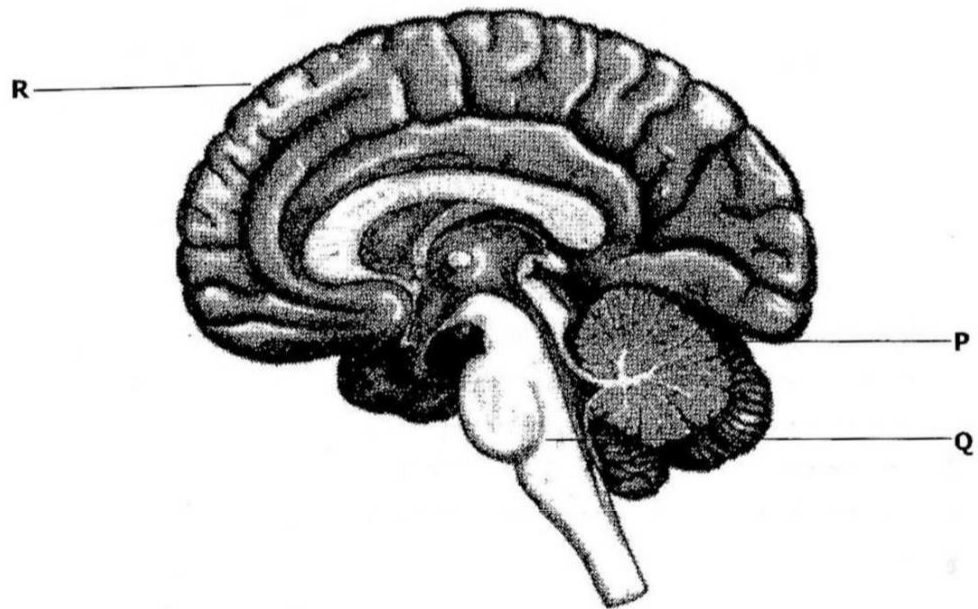
What path is taken by an impulse in the reflex arc?

- A** 1 → 2 → 3 → 4
- B** 1 → 2 → 5 → 4
- C** 3 → 2 → 5 → 4
- D** 4 → 5 → 2 → 3

22 The diagram shows a section through the human eye. Which part contains rods and cones?

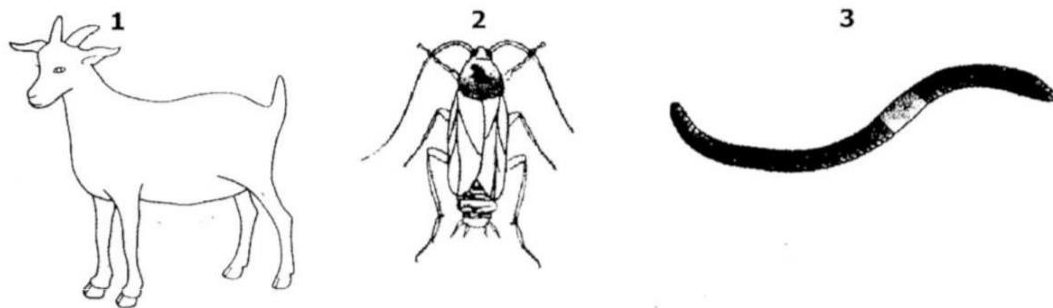


23 What are the functions of the structures labelled P, Q and R?



	P	Q	R
A	Control heart beat	Thinking	Control posture and balance
B	Control posture and balance	Control heart beat	Thinking
C	Thinking	Control heart beat	Control posture and balance
D	Thinking	Control posture and balance	Control heart beat

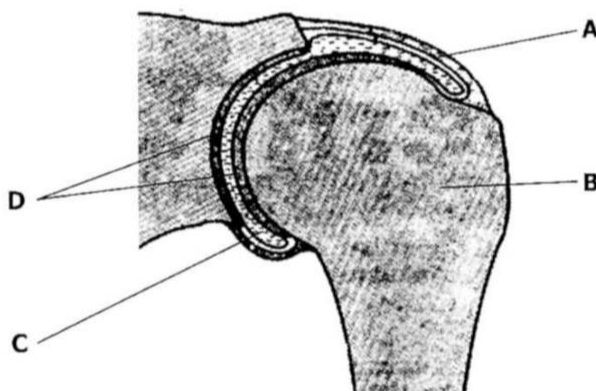
24 The diagrams below show three different organisms (not drawn to scale).



What type of skeleton is found in each of these organisms?

	1	2	3
A	Endoskeleton	Exoskeleton	Hydrostatic
B	Endoskeleton	Hydrostatic	Exoskeleton
C	Exoskeleton	Endoskeleton	Hydrostatic
D	Exoskeleton	Hydrostatic	Exoskeleton

25 The diagram shows a section through a joint.



Which labelled part prevents dislocation of the joint?

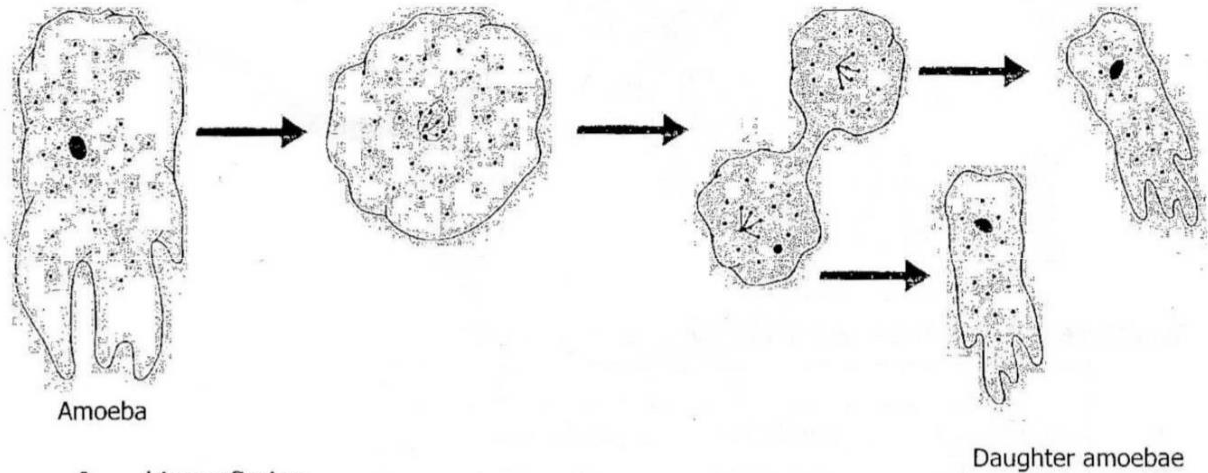
26 The following are events which occur during sexual reproduction in plants.

- 1 fusion of male and female nuclei
- 2 dispersal of seeds
- 3 germination of pollen grains
- 4 transfer of pollen grains from anthers to stigma
- 5 formation of seeds from ovules

In which order do these events occur?

- A 5 → 4 → 3 → 2 → 1
- B 4 → 3 → 1 → 5 → 2
- C 3 → 5 → 4 → 2 → 1
- D 2 → 1 → 4 → 5 → 3

27 What type of asexual reproduction is illustrated in the following diagram?



- A binary fission
- B budding
- C fragmentation
- D Spore formation

28 The diagram shows the female reproductive system.



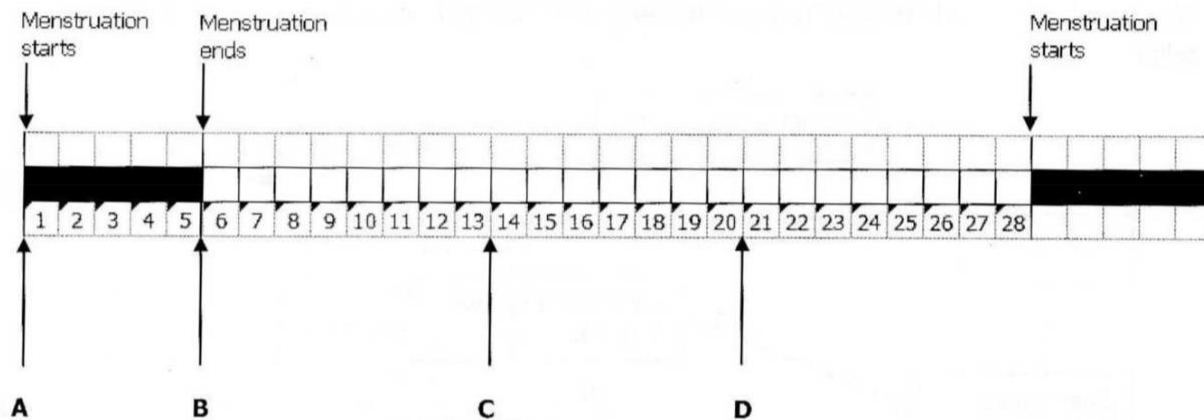
What is the function of the part labelled X?

- A Hormone secretion and implantation.
- B Production of gametes and hormone secretion.
- C Production of gametes and implantation.
- D Site for fertilization of ovum by sperm.

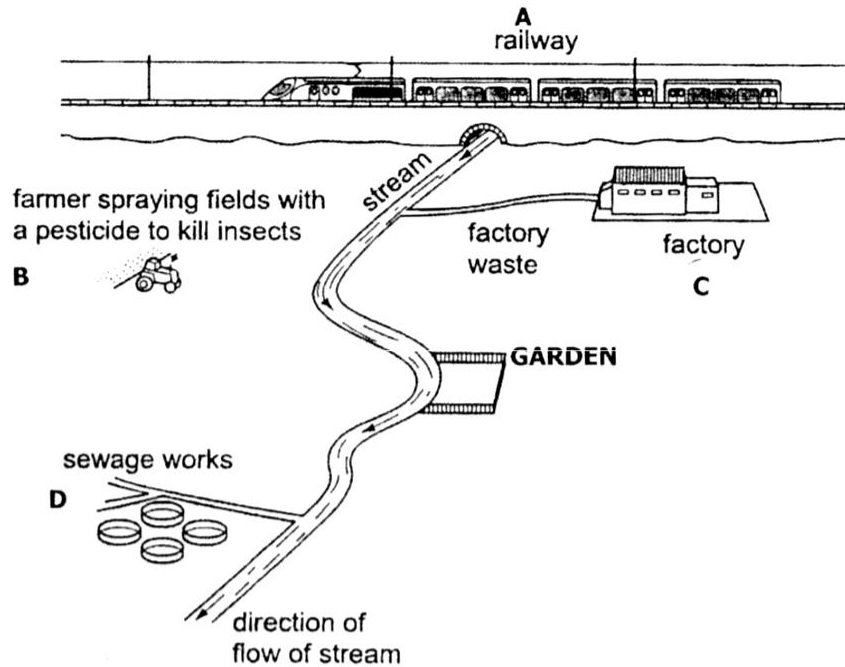
- 29 Which type of reproduction and which type of cell division produces nuclei with half the number of chromosomes?

	Type of reproduction	Type of cell division
A	Asexual	Meiosis
B	Asexual	Mitosis
C	Sexual	Meiosis
D	Sexual	Mitosis

- 30 The diagram shows a woman's menstrual cycle. On which day is intercourse most likely to result in the woman becoming pregnant?



- 31 What is the advantage of passive immunity?
- A** It gives immediate protection.
 - B** It lasts longer than active immunity.
 - C** It makes antibodies very quickly.
 - D** It makes the white blood cell produce antibodies.
- 32 Why is a cholera patient given oral rehydration salt?
- A** To help prevent dehydration of the body.
 - B** To increase antibodies and salts.
 - C** To prevent the cholera bacteria from multiplying.
 - D** To remove the cholera bacteria from the intestines.



- 36 Which of the following correctly identifies the distribution of earthworms in the given types of soils?

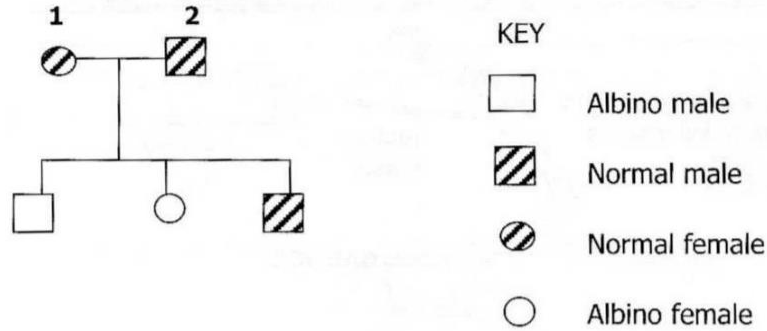
	Clay soil	Loam soil	Sandy soil
A	Few	Few	Many
B	Few	Many	Few
C	Many	Few	Many
D	Many	Many	Few

- 37 A pure breeding white mouse was crossed with a pure breeding black mouse. All their offspring were black. Then one of the offspring was bred with a pure breeding white mouse. They produced ten (10) baby mice.

What are the most likely colours of these mice?

- A 5 black and 5 white.
 B 8 white and 2 black.
 C 10 black.
 D 10 white.

- 38 The diagram below shows the inheritance of albinism in a family. Albinism is caused by a recessive allele.



What are the genotypes of parents 1 and 2?

- | | | |
|----------|----------|----------|
| | 1 | 2 |
| A | AA | AA |
| B | AA | Aa |
| C | Aa | Aa |
| D | aa | aa |
- 39 Which of the following genetic disorders is an example of chromosomal mutation?
- A** Albinism.
 - B** Colour blindness.
 - C** Down's syndrome.
 - D** Sickle cell anaemia.
- 40 The following are some of the details on John's medical records:-
1. Blood group: O
 2. Height: 1.68 metres
 3. Weight: 81kg
 4. Sex: Male

What types of variation match with these details?

	Continuous	Discontinuous
A	1 and 2	3 and 4
B	2 and 3	1 and 4
C	3 and 4	1 and 2
D	4 and 1	2 and 3