EXAMINATIONS COUNCIL OF ZAMBIA

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

BIOLOGY 5090/1

PAPER 1 Multiple Choice

Monday **8 NOVEMBER 2010** **50 minutes**

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 booklet until you are told to do so.
Look at the left hand side of your answer sheet. Ensure that your name, the school/centre name and subject paper are **printed**. Also ensure that the subject code, paper number, centre code, your examination number and the year are **printed** and **shaded**. Do not change the already printed information.

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 best answewr and shade according to instructions on the answer sheet.

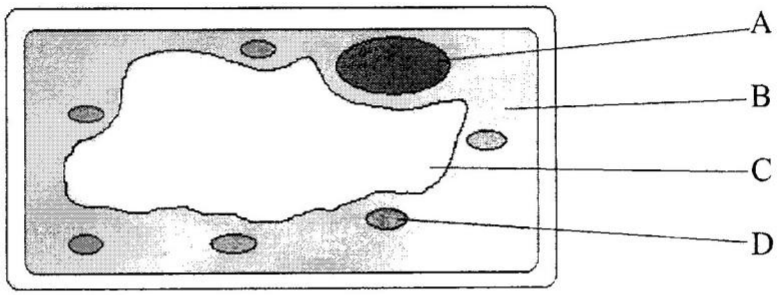
Read very carefully the instructions on the answer sheet.

INFORMATION FOR CANDIDATES

Each correct answer will score one mark.
Any rough working should be done in this booklet.

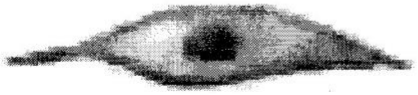
Cell phones are not allowed in the examination room.

1 The diagram below shows a cell from a leaf of a plant.

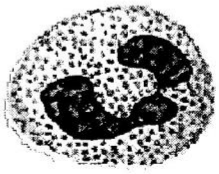


Which of the labelled parts stores salts?

2 The diagrams below show four different animal cells as seen through a microscope.



1



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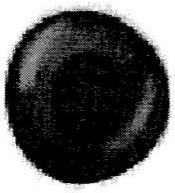
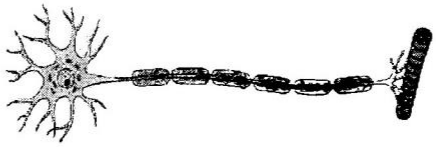


3



4

What are these cells called?

	1	2	3	4
A	Neuron	Red blood cell	White blood cell	Muscle cell
B	Muscle cell	White blood cell	Red blood cell	Neuron
C	Muscle cell	Neuron	Red blood cell	White blood cell
D	White blood cell	Muscle cell	Red blood cell	Neuron

3 The process that can reduce the rate of photosynthesis is ...

A respiration.

B pollution.

C germination.

D transpiration.

4 What is the total number of teeth in the mouth of a rabbit whose dental formula is $I\frac{1}{1}$, $C\frac{0}{0}$, $Pm\frac{0}{0}$, $M\frac{3}{3}$?

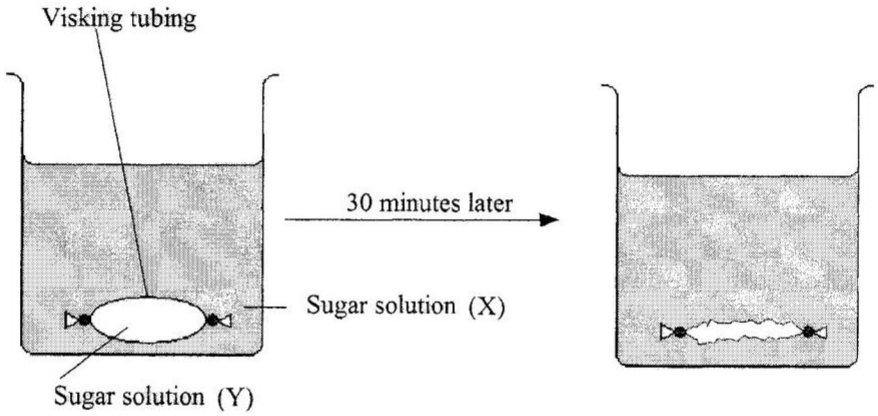
A 14

B 6

C 8

D 28

5 The diagram below shows an experiment to investigate osmosis.



Which of the following statements is correct about sugar solution **X** and sugar solution **Y**?

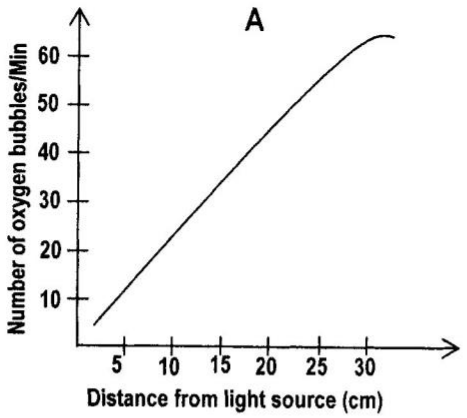
A Solution Y is more concentrated than Solution X.

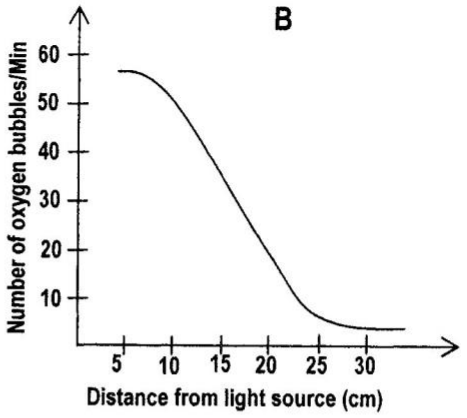
B Solution X is more concentrated than Solution Y.

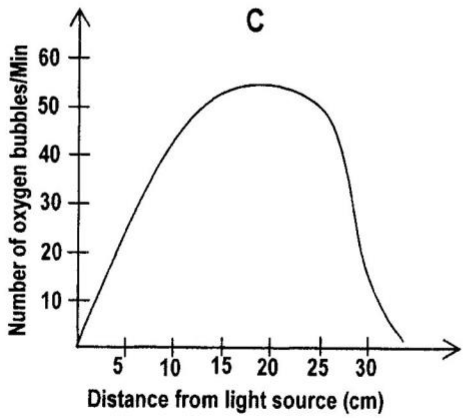
C Both soutions X and Y are of equal concentrations.

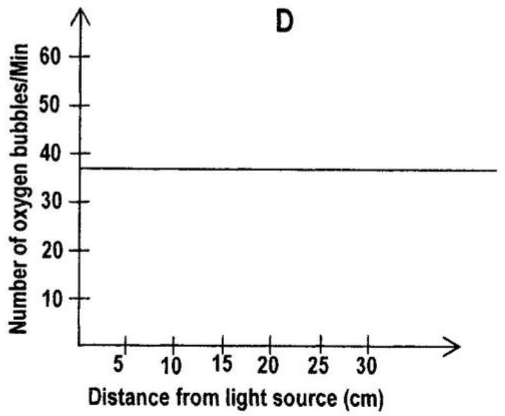
D Sugar molecules diffused out of Solution Y into Solution X.

6 Which of the following graphs shows the effect of light intensity on the rate of photosynthesis in a pond weed (*Elodea*)?

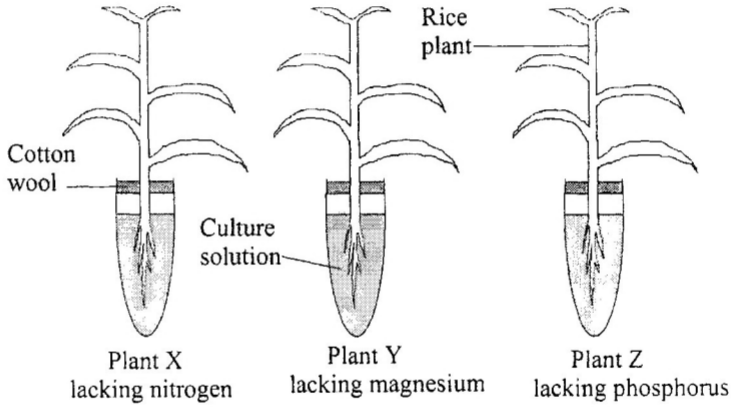








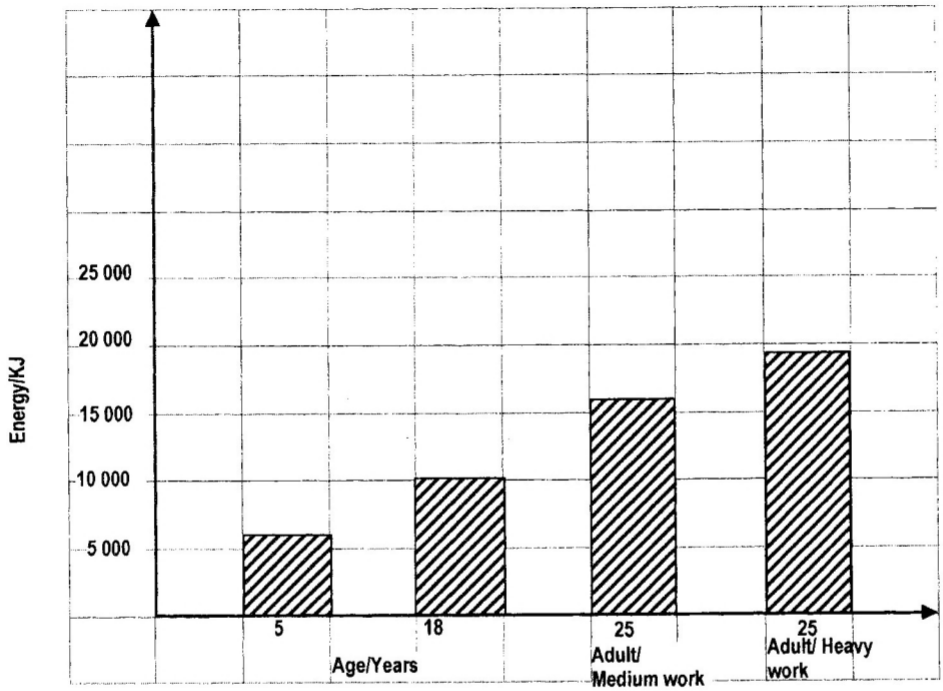
7 The following diagrams show an experimental procedure to investigate the mineral salt requirement of rice plants grown in different culture solutions.



What would be the defficiency symptoms observed in plants **X**, **Y** and **Z** after three weeks?

	Deficiency symptom in Plant X	Deficiency symptom in Plant Y	Deficiency symptom in Plant Z
A	Stunted growth	Poor root development	Yellowing of leaves
B	Stunted growth	Yellowing of leaves	Poor root development
C	Poor root development	Stunted growth	Yellowing of leaves
D	Poor root development	Yellowing of leaves	Stunted growth

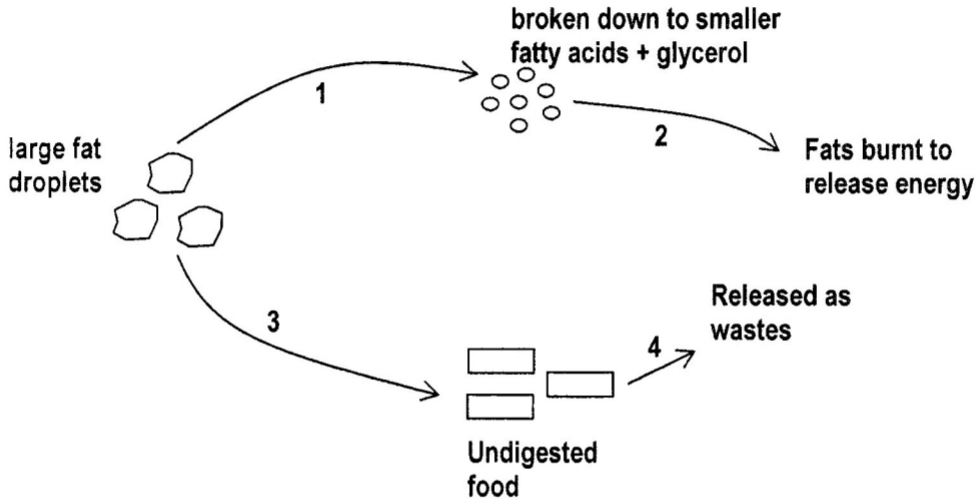
8 The figure below shows changing energy requirements with age and type of occupation.



What is the difference in energy requirement between a boy aged 5 years and a 25 year old adult doing heavy work?

A 8 000KJ
B 10 000KJ
C 12 000KJ
D 14 000KJ

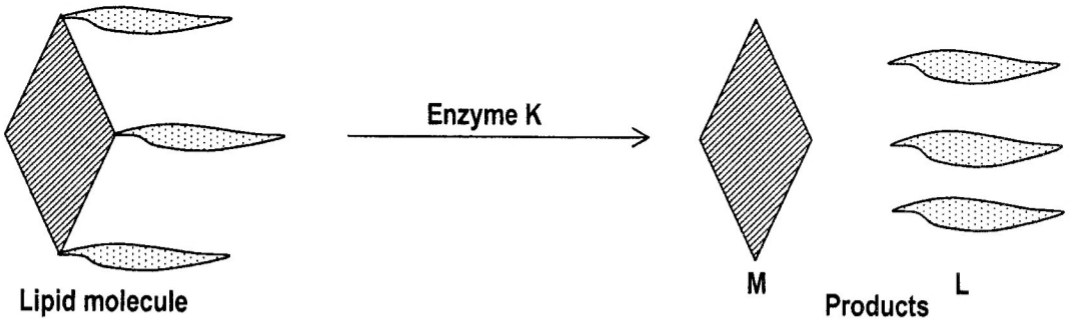
9 The diagram below shows processes taking place in an organism.



Which numbered part represents the process of respiration?

A 2 only
B 1 and 2
C 1 and 3
D 2 and 3

10 The diagram below shows chemical digestion of a nutrient in the human body.



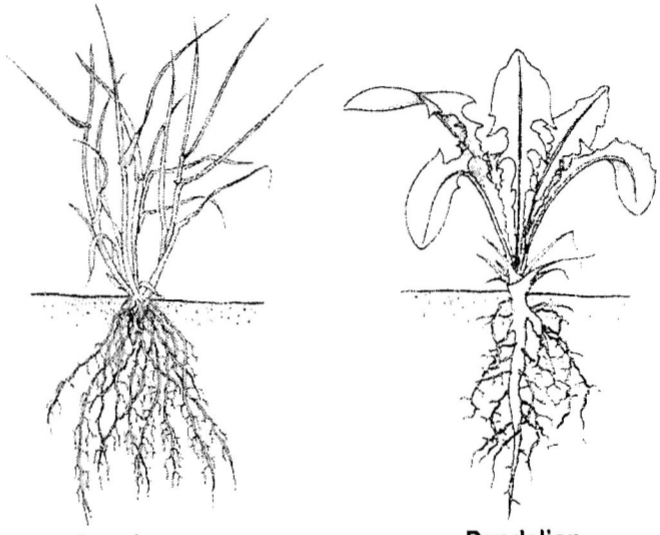
Identify enzyme **K** and products **M** and **L**.

	Enzyme K	**Product M**	**Product L**
A	Lipase	Fatty acid	Glycerol
B	Lipase	Glycerol	Fatty acids
C	Trypsin	Peptide	Amino acids
D	Maltase	Glucose	Fructose

11 Which of the following blood vessels will have the highest level of amino acids after a meal rich in proteins?

A Aorta
B Pulmonary vein
C Hepatic portal vein
D Renal vein

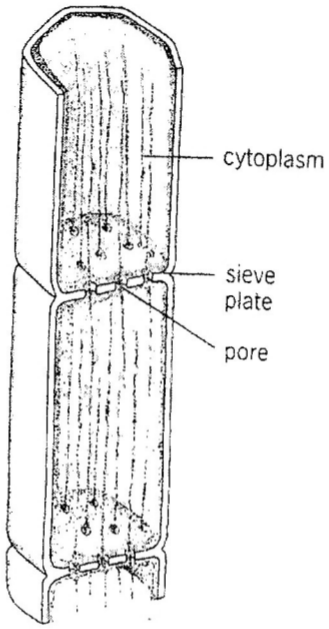
12 Which of the following correctly identifies the types of root system?



Couch grass Dandelion

	Couch grass	Dandelion
A	Tap root	Fibrous
B	Adventitious	Fibrous
C	Tap root	Adventitious
D	Fibrous	Tap root

13 The diagram below shows a longitudinal section through the phloem.



Name a substance that is conducted across the sieve plates.

A Glucose
B Starch
C Sucrose
D Proteins

14 The following events occur during blood clotting.

1. Fibrinogen changed to fibrin.
2. Platelets release thromboplastins.
3. Prothrombin converted to thrombin.
4. Fibrin forms a network of fibres that traps blood cells.

In which order do these events occur?

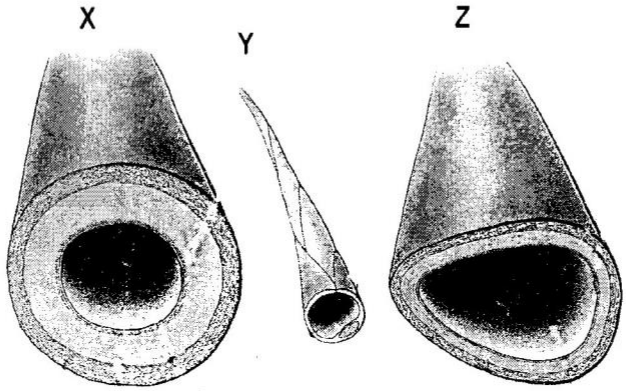
A $2 \rightarrow 3 \rightarrow 1 \rightarrow 4$

B $1 \rightarrow 2 \rightarrow 3 \rightarrow 4$

C $3 \rightarrow 4 \rightarrow 2 \rightarrow 1$

D $4 \rightarrow 1 \rightarrow 2 \rightarrow 3$

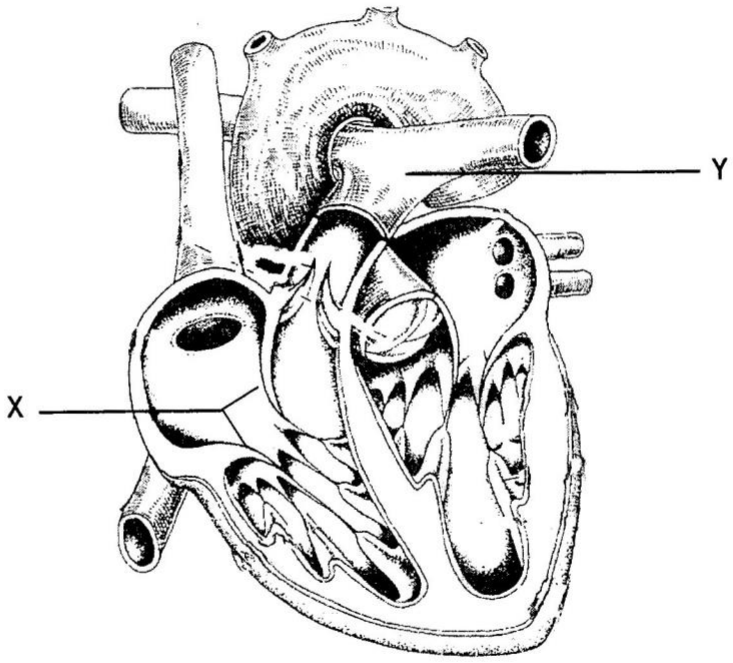
15 The diagrams below show a cross section of the three types of blood vessels drawn to scale.



What are these blood vessels called?

	X	Y	Z
A	Vein	Artery	Capillary
B	Capillary	Vein	Artery
C	Vein	Capillary	Artery
D	Artery	Capillary	Vein

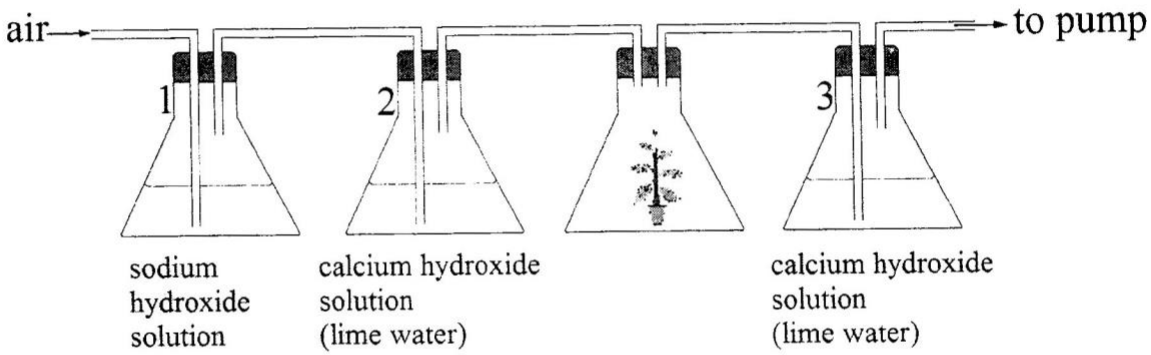
16 The diagram shows the internal structure of the heart.



Identify **Valve X** and **Vessel Y?**

	Valve X	**Vessel Y**
A	bicuspid	pulmonary vein
B	tricuspid	pulmonary artery
C	semi lunar	aorta
D	semi lunar	vena cava

17 The diagram below shows the apparatus that can be used to investigate whether carbon dioxide is given off by a potted plant during respiration.



Which one of the following would you expect to observe in the flasks labelled **1**, **2** and **3**

	FLASK 1	FLASK 2	FLASK 3
A	Cloudy	Clear	Cloudy
B	Cloudy	Cloudy	Clear
C	Clear	Clear	Cloudy
D	Clear	Cloudy	Cloudy

18 Which of the following reactions of tissue respiration occuring in a human being would yield the largest amount of energy?

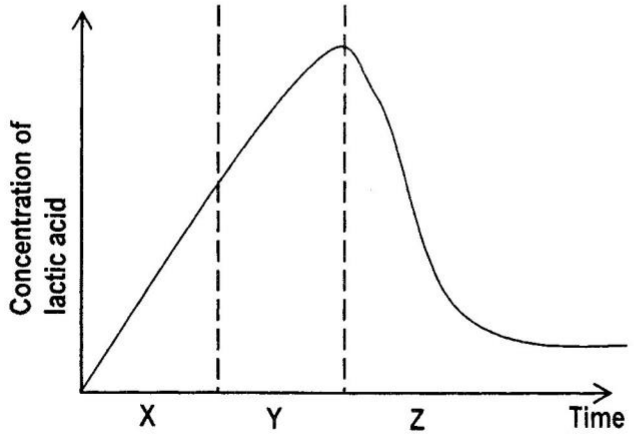
A Glucose (1g) + Oxygen → Carbon dioxide + water + Energy.

B Glucose (1g) → Lactic acid + Energy.

C Glucose (1g) → Ethanol + Carbon dioxide + Energy.

D Fatty acid (1g) + Oxygen → Carbon dioxide + water + Energy.

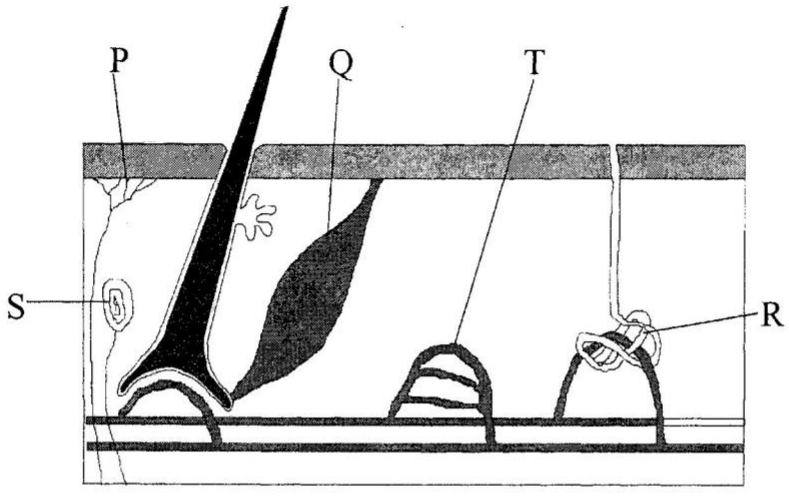
19 The graph shows the concentration of lactic acid in the blood of an athlete.



During which time(s) was the athlete exercising?

A Period X
B Period Y
C Period X and Y
D Period X and Z

20 The diagram below shows a vertical section through a mammalian skin.



To which of the structures labelled P, Q, R, S or T does blood supply increase when the body is too hot to help return the temperature to normal?

A P and Q

B P and R

C R and T

D S and T

21 Which of the following is a nitrogenous waste in plants?

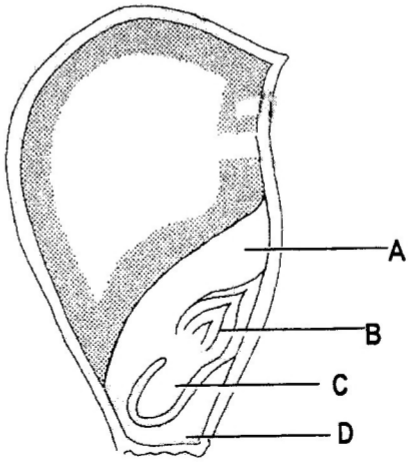
A Urea

B Cocaine

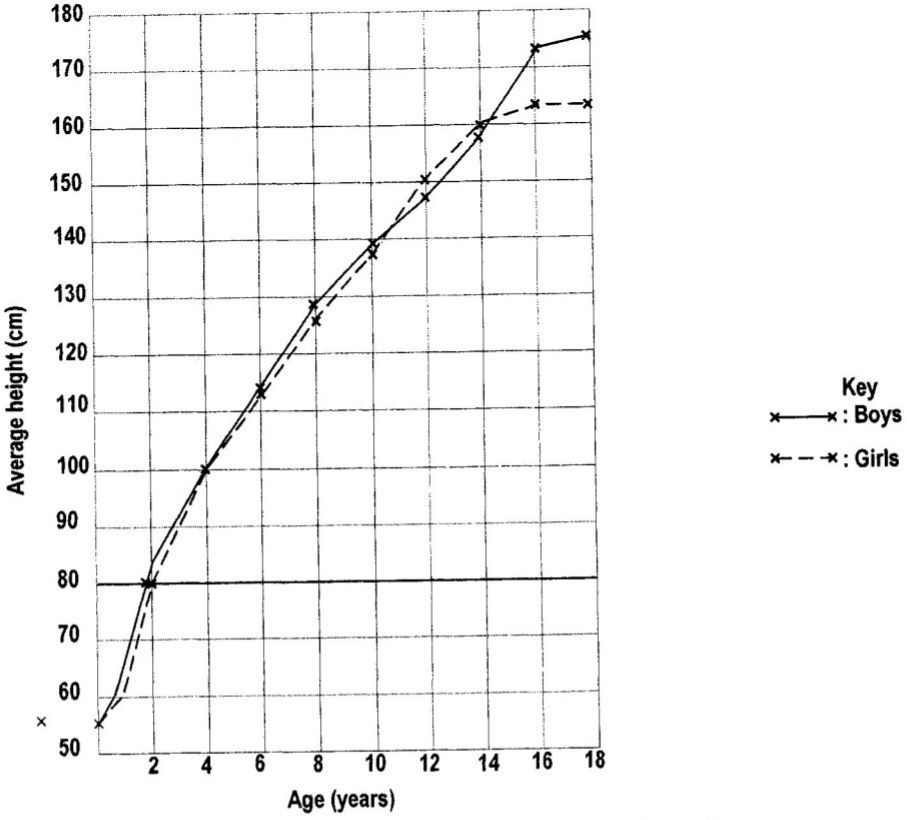
C Latex

D Oil

22 The figure below shows the longitudinal section of a maize seed.
Which of the labelled parts grow into roots?



23 The graph below shows the average height of boys and girls up to the age of 18 years.



At what age are girls generally taller than boys?

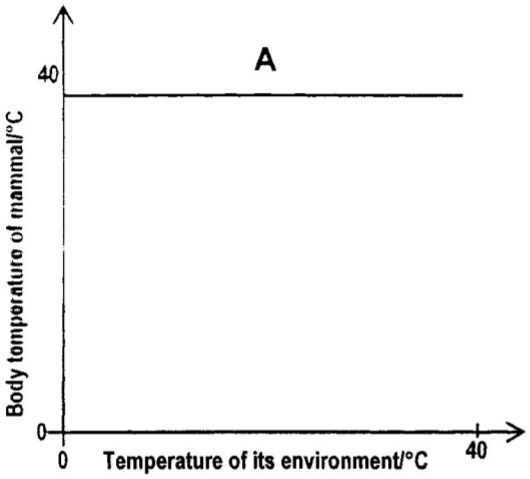
A 4 – 6 years

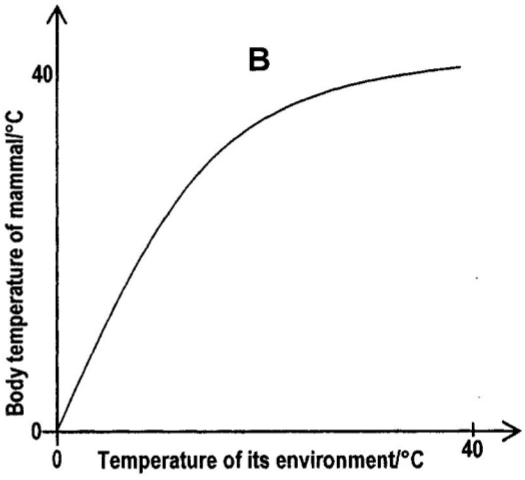
B 6 – 10 years

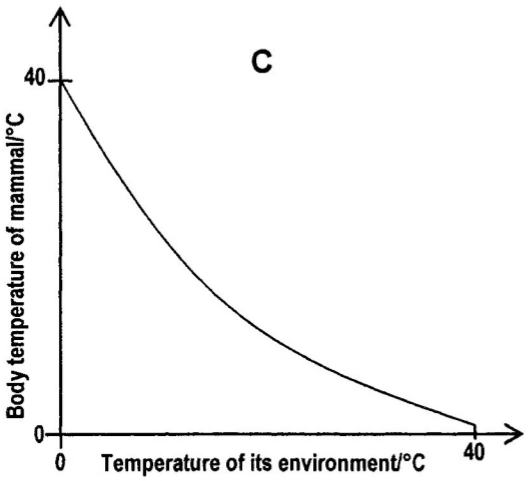
C 11 – 14 years

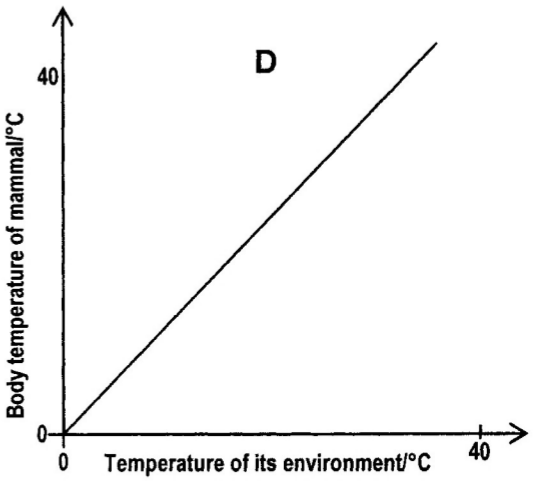
D 15 – 18 years

24 Which of the following graphs shows the correct relationship between a mammal's body temperature and the temperature of its environment?

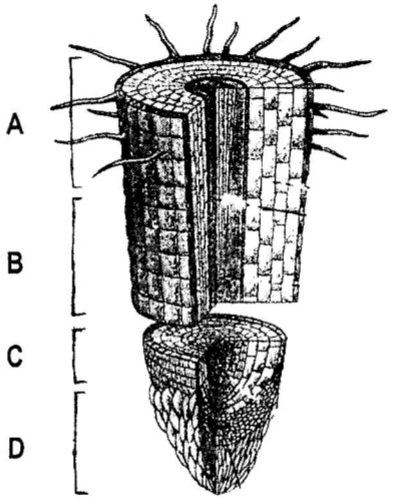






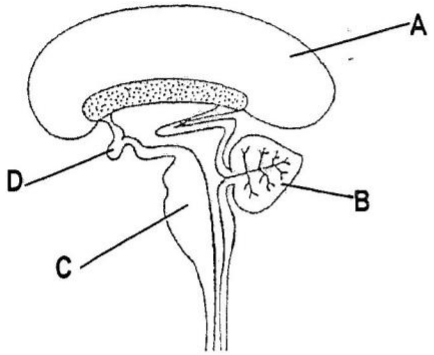


25 The diagram below shows part of a growing root.



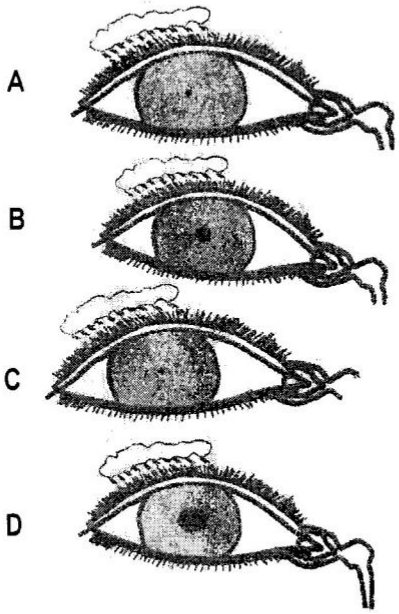
Identify the region of cell differentiation and specialisation.

26 The diagram below shows a section through the human brain.

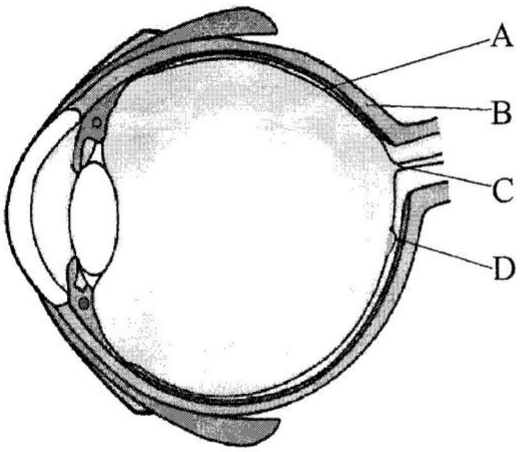


Which of the labelled structures is the centre for processes such as thought, memory and judgement?

27 Select the diagram that correctly shows the size of the pupil of the human eye when in the dark.

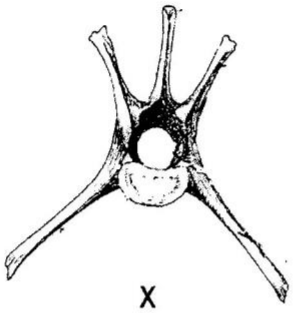


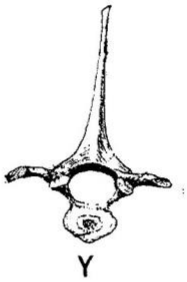
28 The diagram below shows a section of a mammalian eye.



In which of the labelled parts is there the greatest concentration of cone cells?

29 The diagrams below show anterior view of the two bones from the vertebral column.

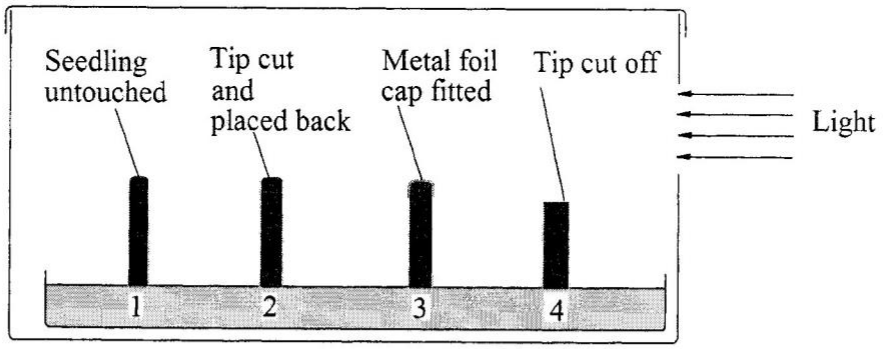

X


Y

From which regions of the vertebral column are the two bones found?

	X	Y
A	Thoracic	Cervical
B	Thoracic	Lumbar
C	Lumbar	Thoracic
D	Cervical	Sacral

30 The diagram below shows an experiment set up to demonstrate the response of maize seedlings to light. They are growing in a box with a hole cut at one end.



Which of the seedlings labelled **1**, **2**, **3** or **4** would grow towards light?

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

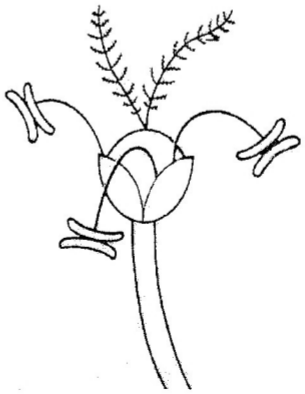
31 Which of the following pairs of stimuli can affect the distribution of auxins in plant roots and shoots?

A Light and water.
B Gravity and water.
C Gravity and light.
D Light and chemical.

32 Which of the following bones form a hinge joint?

A Humerus and ulna.
B Radius and scapula.
C Radius and ulna.
D Scapula and humerus.

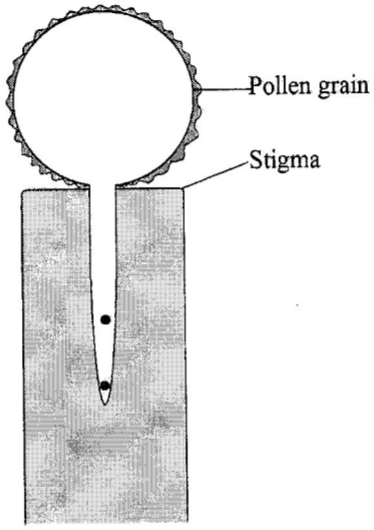
33 The diagram below shows a flower of a type of a wind-pollinated grass called *Ileucine indica.*



In the diagram, what feature shows that the flower is wind-pollinated?

A Club-shaped stigma
B Petals
C Nectar gland
D Feathery stigma

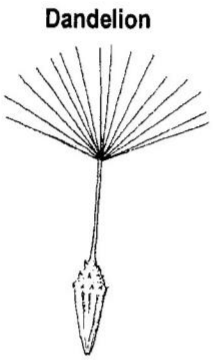
34 The diagram below shows a pollen grain soon after it landed on the stigma.

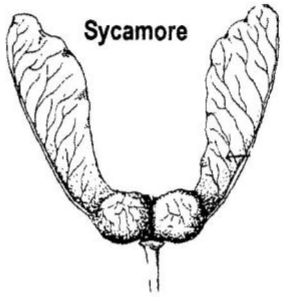


What process has the pollen grain undergone to appear as shown in the diagram?

A Pollination
B Fertilization
C Elongation
D Germination

35 The diagram below shows fruits of Dandelion and Sycamore.

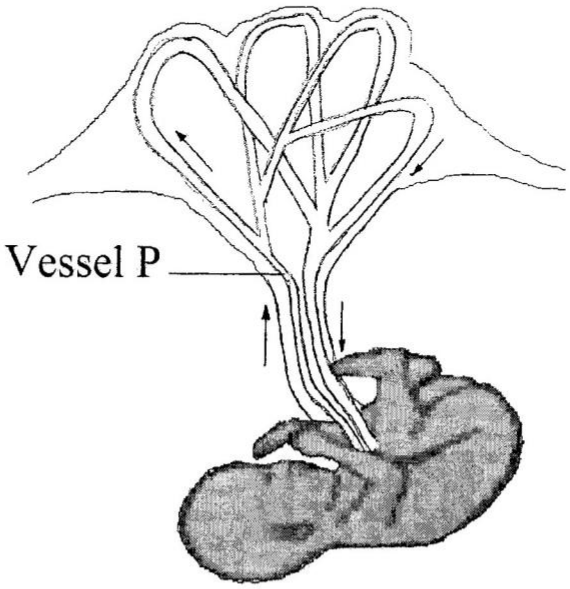




How is each of them dispersed?

	Dandelion	**Sycamore**
A	Animal	Water
B	Self	Wind
C	Wind	Wind
D	Wind	Animal

36 The following diagram shows a developing foetus in the uterus.



Which of the following shows the composition of blood in blood vessel P?

	Glucose Concentration	Oxygen Concentration	Carbon dioxide concentration
A	Low	High	Low
B	Low	Low	High
C	High	Low	Low
D	High	High	High

37 Which of the following is the most important advantage of sexual reproduction over asexual reproduction?

A It protects the embryo during its early growth.

B It ensures the survival and growth of the species.

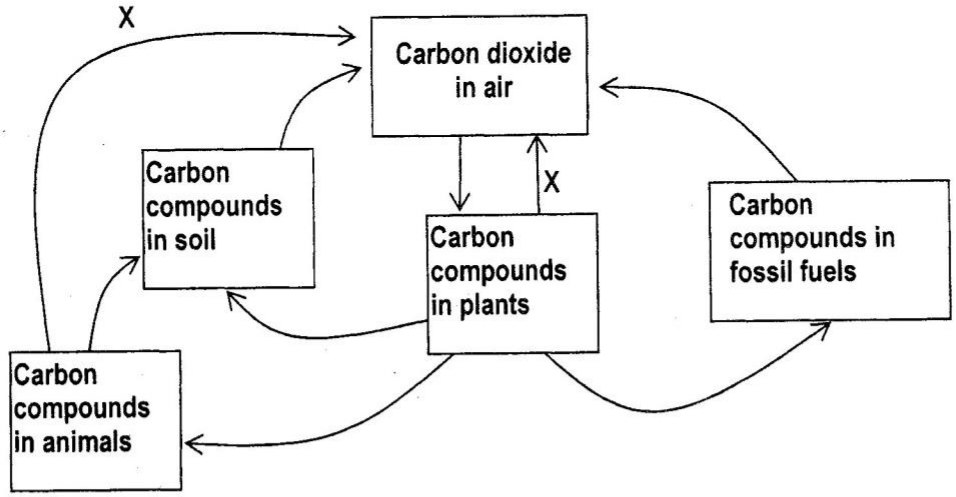
C It allows variation to arise in the offspring.

D It produces offsrping more quickly.

38 Match the following diseases with their causative agents.

	Influenza	**Tuberculosis**	**Malaria**
A	Virus	Bacterium	Protozoan
B	Protozoan	Virus	Bacterium
C	Protozoan	Bacterium	Virus
D	Virus	Protozoan	Bacterium

39 The diagram below shows the carbon cycle.



Identify the process represented by letter **X**.

A Photosynthesis

B Decomposition

C Combustion

D Respiration

40 Albinism in humans is a condition caused by a recessive gene. If two albinos marry, what is the chance of them having a normal child?

A 0%

B 50%

C 75%

D 100%