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 **9 NOVEMBER 2009** **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.
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.

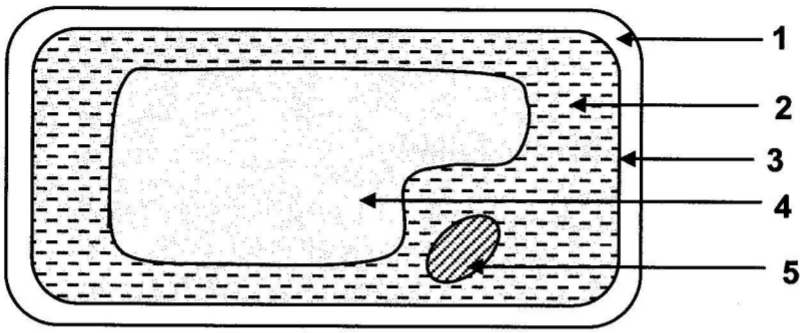
INFORMATION FOR CANDIDATES

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 booklet.

Cell phones are not allowed in the examination room.

[Turn over

1 The diagram below shows a plant cell.



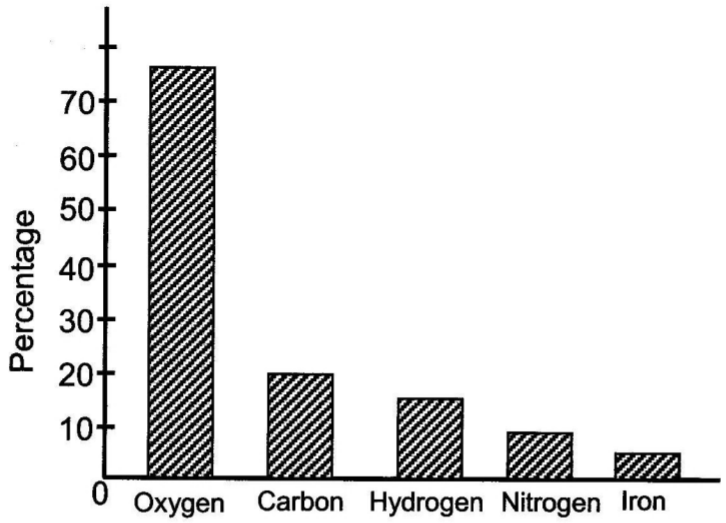
Which of the labelled parts make up the protoplasm?

A 1, 2, 3
B 2, 3, 5
C 3, 4, 5
D 1, 4, 5

2 Which of the following carbohydrate is found in most cell walls of fungi?

A Cellulose
B Chitin
C Sugar
D Keratin

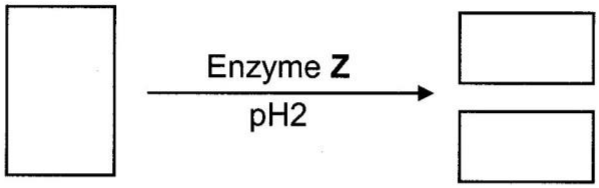
3 The bar chart below shows the percentage of some of the elements in the human body.



Which of the following compounds contain all these elements in the bar chart?

A Haemoglobin
B Amino acid
C Glucose
D Fatty acid

4 The diagram shows the breakdown of a food substance.



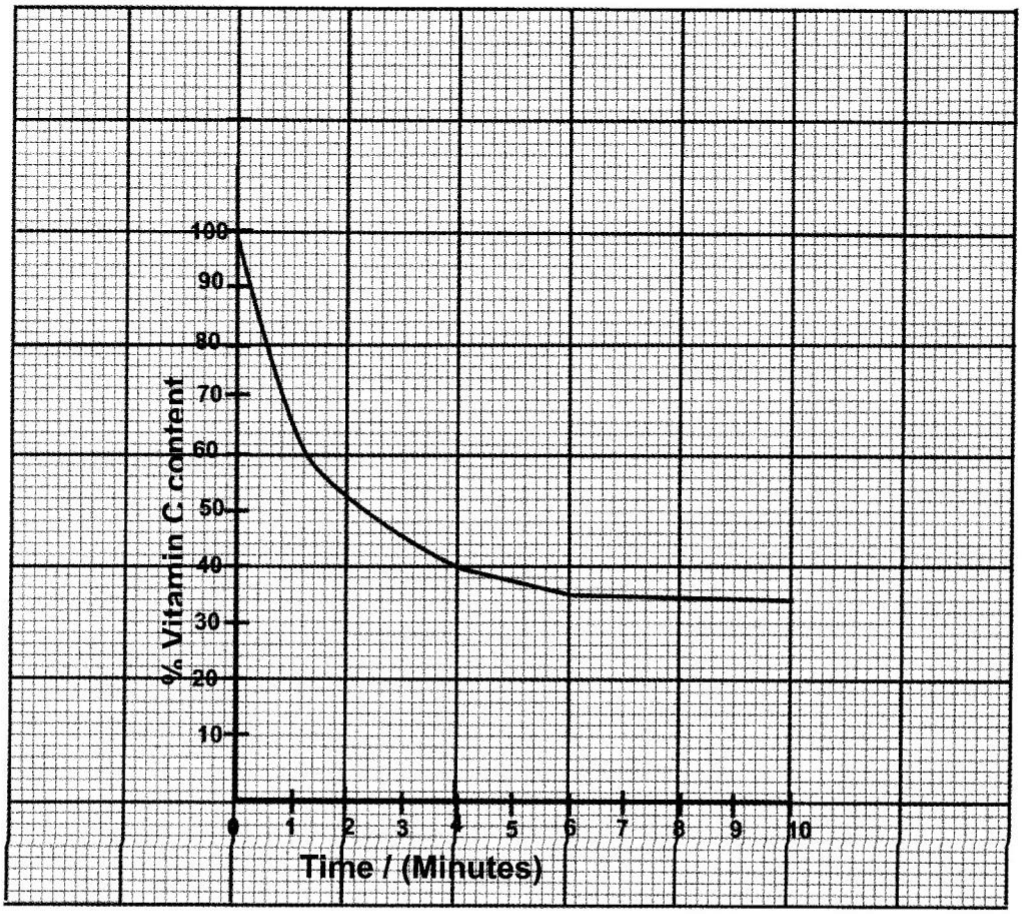
Substance **X** → Substance **Y**

What is substance **Y** and enzyme **Z**?

	Substance Y	**Enzyme Z**
A	Maltose	Amylase
B	Peptides	Pepsin
C	Maltose	Maltase
D	Peptides	Pepsinogen

5 A graph below shows the effect of boiling a finely shredded cabbage on the amount of vitamin C in the cabbage.

Percentage content of Vitamin C in the cabbage over a period of ten minutes



What conclusion can be drawn from the results shown in the graph?

A Boiling has no effect on the content of Vitamin C.
B Boiling adds vitamin C to the cabbage.
C Boiling reduces vitamin C content in cabbage.
D Boiling removes all the vitamin C.

6 Leaves of two different plants X and Y have blue cobalt chloride paper fixed on their lower surfaces. After a period of five minutes the paper on the leaf of plant X has turned pink, and the one on plant Y remains blue. What could have caused the colour change on plant X?

A Plant X has a greater rate of respiration.

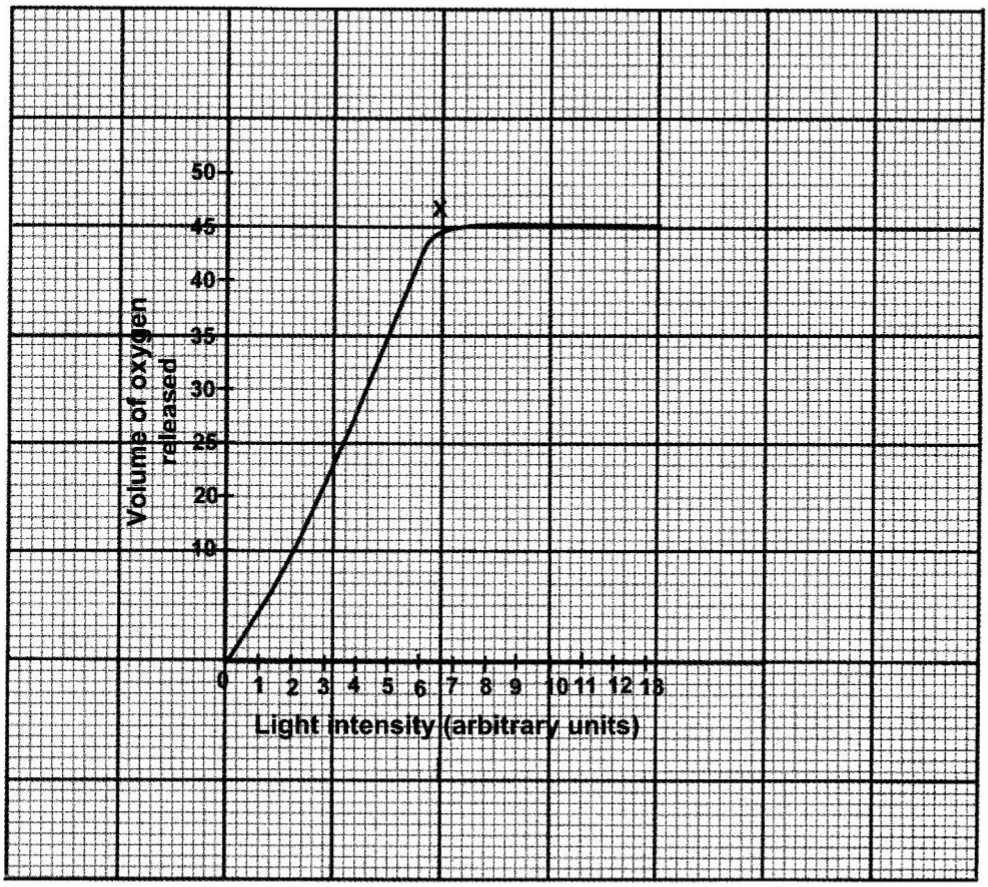
B Plant X has a greater rate of transpiration.

C Plant X has a greater rate of photosynthesis.

D Plant X has greater rate of tranlocation

7 The graph below shows the results obtained during an experiment to determine the rate of photosynthesis by measuring the volume of oxygen released by a pond weed at varying light intensities.

The effect of light intensity on the rate of photosynthesis.



Why does the graph become constant after point **X**?

A Factors other than light intensity became limiting.

B The release of oxygen became constant.

C The light intensity no longer had an effect.

D Oxygen was not being evolved anymore.

8 Which of the following best explains the significance of transpiration in plants?

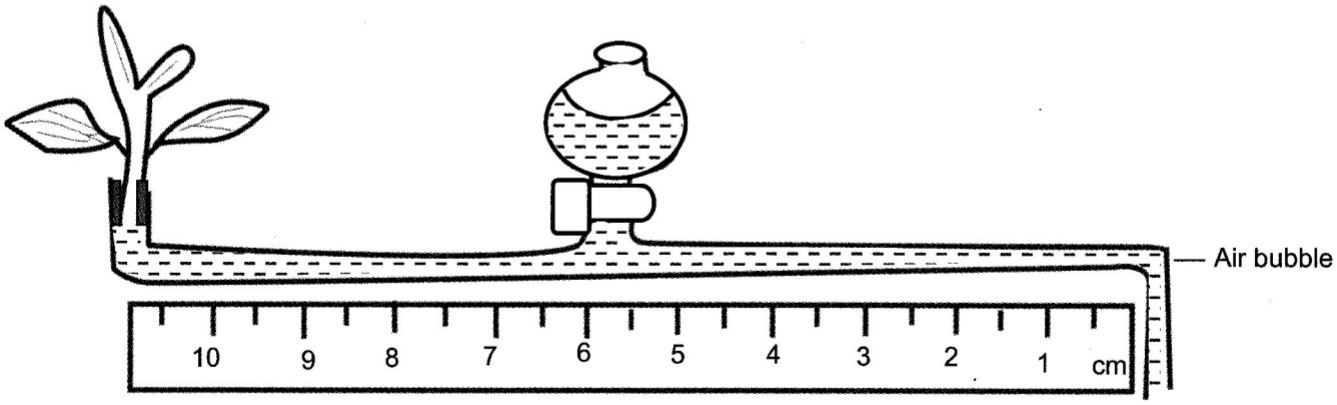
A It makes plant cells flacid.

B Promotes respiration in leaves.

C Causes carbon dioxide to be excreted.

D Enables water to move up the plant.

9 The diagram below shows a potometer used to measure the rate of transpiration in varying environmental conditions.



The table below also shows the results obtained during this experiment.

Results Obtained

Environmental Conditions	**1** High light intensity	**2** High humidity	**3** Windy (Electric fan) over plant surface	**4** Low humidity
Time taken for bubble to move 10 cm in 10 minutes	6	18	2	12

During which environmental condition was transpiration rate highest?

A 1

B 2

C 3

D 4

10 Why are blood group O people considered as universal donors of blood?

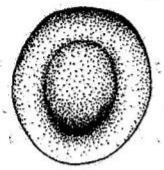
A Their blood has both A and B antigens.

B Their blood has neither anti A nor Anti B antibodies.

C Their blood has neither A nor B antigens.

D Their blood has both anti A and Anti B antibodies.

11 The diagrams below represent some component of blood.



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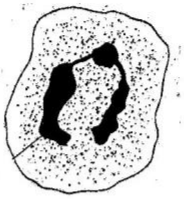


2

3

Which of the following correctly identifies the function of each component.

	1	2	3
A	carry oxygen	engulf bacteria	blood clotting
B	blood clotting	carry oxygen	engulf bacteria
C	engulf bacteria	blood clotting	carry oxygen
D	carry oxygen	blood clotting	engulf bacteria

12 The table lists the characteristics of one blood vessel in the circulatory system of a human being.

Oxygen Concentration	**Presence of Valves**	**Hydrostatic pressure**
Low	Has semilunar valve	High

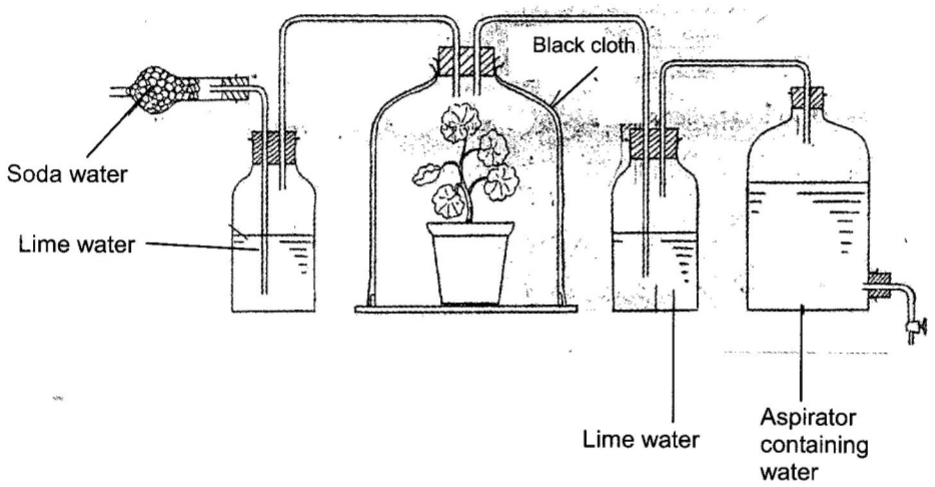
Which blood vessel A, B, C or D has these characteristics?

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

13 Between which of the following parts of an insect does gaseous exchange occur?

A Tissue and spiracles
B Blood and trachea
C Blood and spiracles
D Tissue and trachea.

14 The diagram below shows the experiment used to demonstrate that carbon dioxide is released during respiration.



What is the function of the aspirator in this experiment?

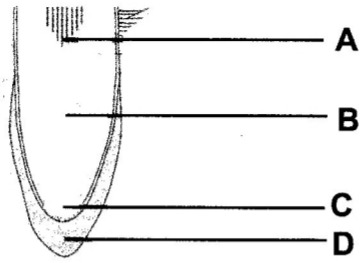
A To pump out air through soda lime

B To draw air in through the soda lime.

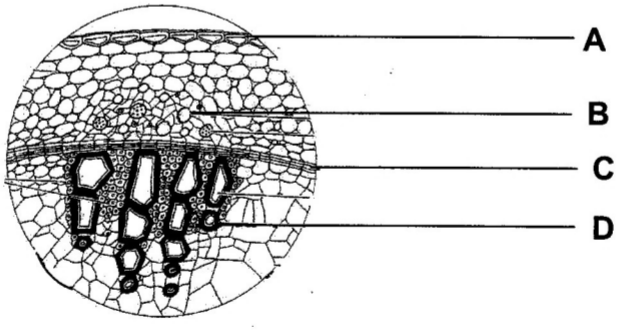
C To produce oxygen.

D To absorb carbon dioxide.

15 The diagram shows a longitudinal section through a dicotyledon root. Which of the labelled parts produce auxins?



16 The diagram shows part of a transverse section of a plant stem.

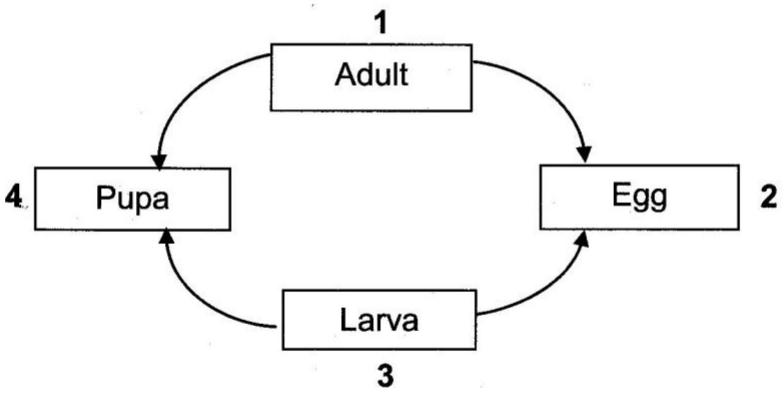


Which of the labelled parts produce additional xylem and phloem cells?

17 To which of the following phyla does a spider belong?

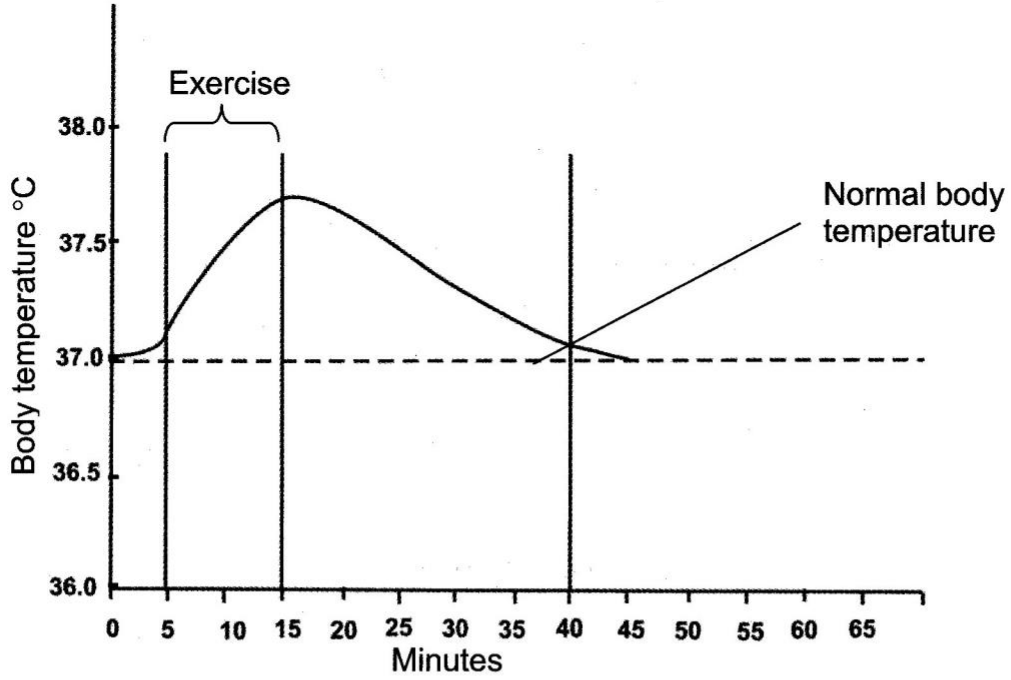
A Nematod
B Arthropod
C Annelida
D Animelia

18 At which stage(s) is a biological control most effective in the life cycle of a mosquito?



A 1 only.
B 4 only.
C 1 and 2.
D 2, 3 and 4.

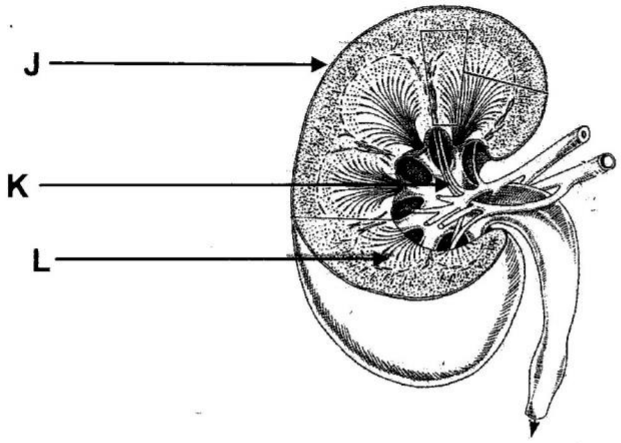
19 The graph below shows the effect of exercise on body temperature.



What is the explanation for change in the body temperature between the 15th and 40th minute?

A Heating causing sweating.
B Cooling causing shivering.
C Heating causing shivering.
D Cooling causing sweating.

20 The diagram below shows a cross section of a kidney identify the labelled structure.



Identify the labelled structures **J**, **K** and **L**.

	J	K	L
A	pelvis	medulla	cortex
B	pelvis	cortex	medulla
C	cortex	pelvis	medulla
D	cortex	medulla	pelvis

21 What is the shortest possible route which urea can take from blood in the lungs to the kidneys?

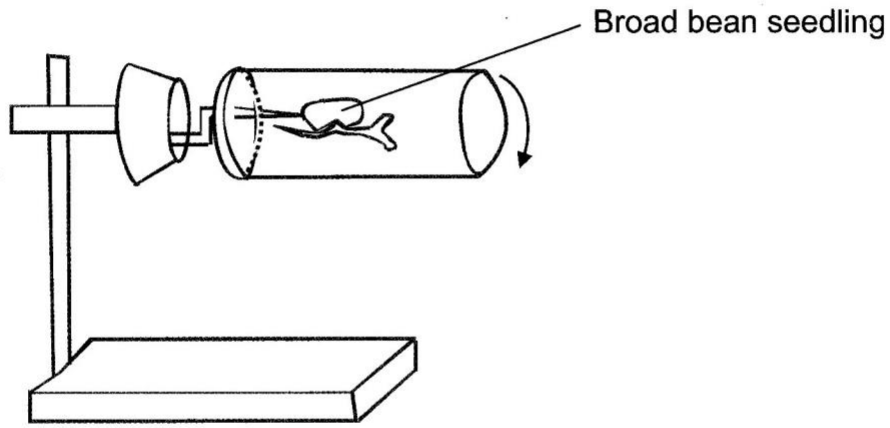
A Pulmonary artery, aorta, renal artery

B Pulmonary vein, aorta, hepatic artery

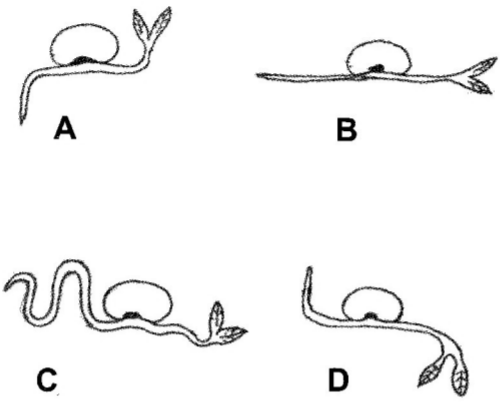
C Pulmonary vein, aorta, renal artery

D Pulmonary artery, aorta, hepatic vein

22 The diagram below represents a klinostat used to demonstrate the response of a seedling to stimuli. It is set at a rotation speed of one complete rotation per hour.



Which of the following shows the resultant growth of the seedling after five days.



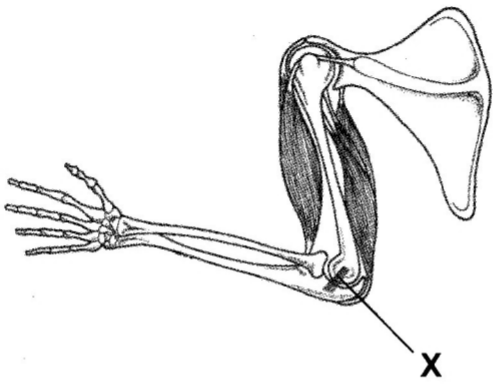
23 Which of the following is an effect of adrenaline?

A Promoting growth.
B Changing glucose into glycogen.
C Promoting deamination of proteins.
D Changing glycogen into glucose.

24 Hydrogen cyanide is a poison that destroys certain parts of the brain. A man who mistakenly took hydrogen cyanide discovered that he could no longer control his thirst, hunger and body temperature. Which part of the brain is most likely to have been affected by the hydrogen cyanide?

A Cerebellum
B Cerebrum
C Hypothalamus
D Pituitary body

25 The diagram shows bones and muscles of the arm.



What is the most important function of the structure labelled **X**?

A To lubricate the joint.
B To prevent dislocation of the joint.
C To transfer the pull of muscle to the bone.
D To act as a shock absorber.

26 Which of the following shows a correct arrangement of the ear ossicles as sound passes through the middle ear?

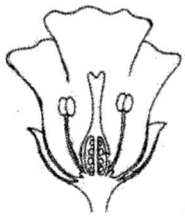
A Incus, stapes, malleus

B Malleus, incus, stapes

C Stapes, malleus, incus

D Incus, malleus, stapes

27 The diagram below shows the structure of an insect pollinated flower.



Which feature on the diagram shows that the flower can **not** self-pollinate?

A Presence of petals

B Presence of sepals

C Large anthers

D Short filament

28 What type of asexual reproduction occurs in yeast?

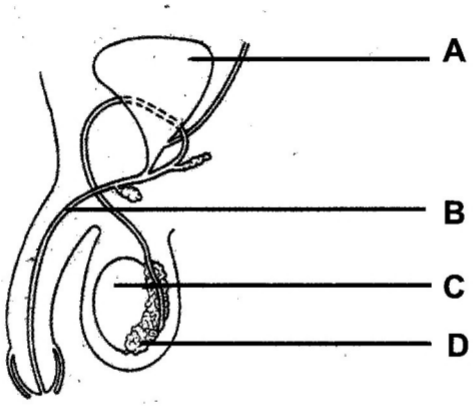
A Budding

B Binary fission

C Regeneration

D Grafting

29 The diagram below shows the male reproductive system.



Which labelled structure is responsible for storing male gametes.

30 Which of the following is responsible for the great increase in size of the uterus in the early part of pregnancy as a result of it's hormonal production.

A Placenta

B Uterus

C Ovary

D Thyroid gland

31 Which one of the following is the **least** effective family planning method?

A Contraceptive pill.

B Spermicide.

C Condom.

D Natural method.

32 Which of the following is an example of natural immunity?

A Production of antibodies after an infection.

B Antiseptic tear fluid spread on conjuctiva

C Vaccination against polio in children

D Taking antibiotic tablets after an infection

33 Which of the following diseases is caused by a virus?

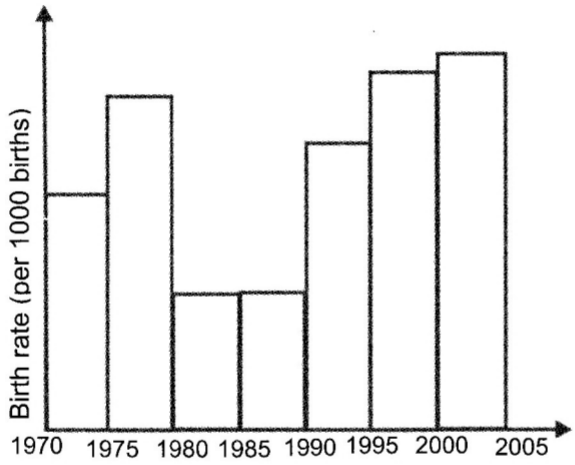
A Cholera

B AIDS

C Tuberculosis

D Bilharzia

34 The graph below shows the birth rate of human beings every five years.



Which of the following could be a factor which contributed to the drop in the birth rate between 1980 and 1990?

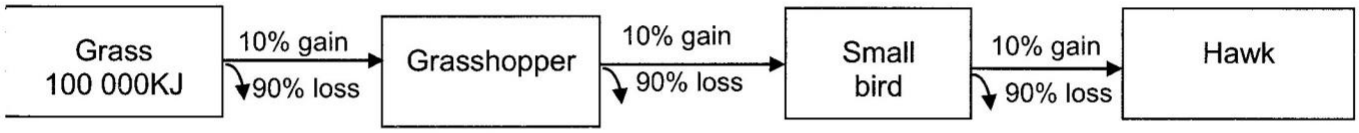
A Death rate of adults increased.

B Death rate of infants increased.

C Growth rate of adults increased.

D Growth rate of infants increased.

35 The figure below shows the flow of energy in a food chain.



What would be the total amount of energy available to the grasshopper?

A 10 000 KJ

B 80 000 KJ

C 90 000 KJ

D 110 000 KJ

36 Some bacteria in water logged soils break down nitrates to obtain oxygen for respiration and release nitrogen gas. What type of bacteria suits this description?

A Decomposition bacteria

B Nitrifying bacteria

C Denitrifying bacteria

D Nitrogen fixing bacteria

37 In fruit flies, red eye is dominant to white eye. If 15% of the population has white eyes, what percentage of the population has at least one dominant gene for red eye?

A 15%

B 30%

C 75%

D 85%

38 Which one of the following is as a result of gene mutation?

A Down's sydrome

B Sickle cell anaemia

C Klinefelter's syndrome

D Turner's syndrome

39 A female zebra with stripes of black and white coat colour was exposed to radiation in the zoo. A few years later it gave birth to an offspring with brown stripes. Which of the following could have been responsible for coat colour in the offspring?

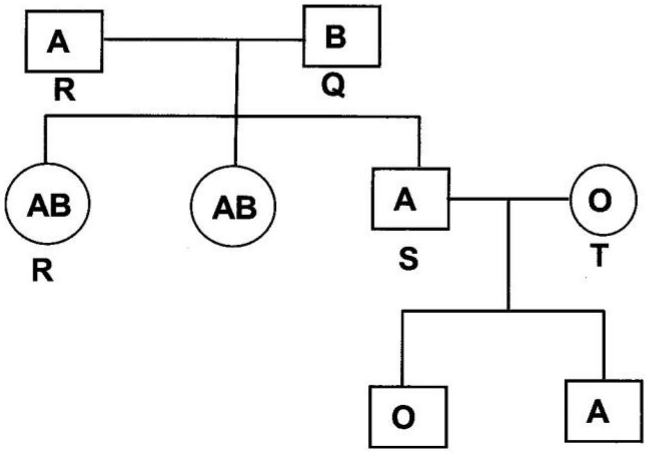
A Mutation had occurred in the parents.

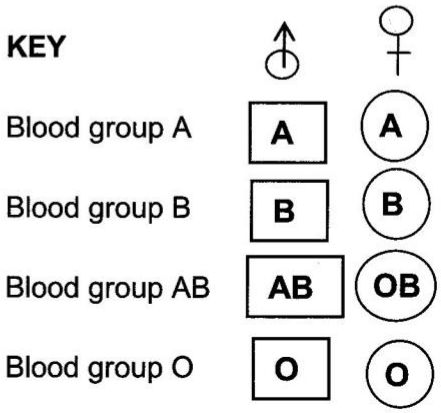
B The parent zebra was homozygous for coat colour.

C The parent zebra was heterozygous for coat colour.

D Inheritance of coat colour was sex-linked.

40 The diagram below shows three generations of a family tree, together with the blood groups of the family members.





What is the genotype of person **S**?

A $I^A\ I^A$

B $I^B\ I^O$

C $I^O\ I^O$

D $I^A\ I^O$