EXAMINATIONS COUNCIL OF ZAMBIA

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

BIOLOGY 5090/1

PAPER 1 Multiple Choice

Wednesday **17 NOVEMBER 2004** **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.

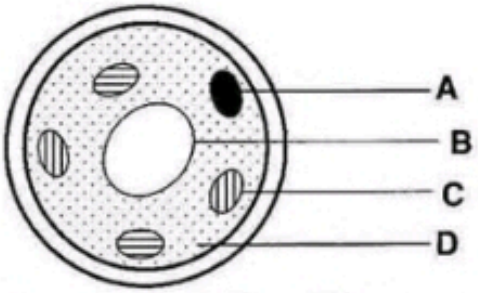
There are **forty** questions in this paper. Answer **all** questions. For each question there are four possible answers; **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the separate answer sheet.

Read very carefully the instructions on the answer sheet.

INFORMATION FOR CANDIDATES

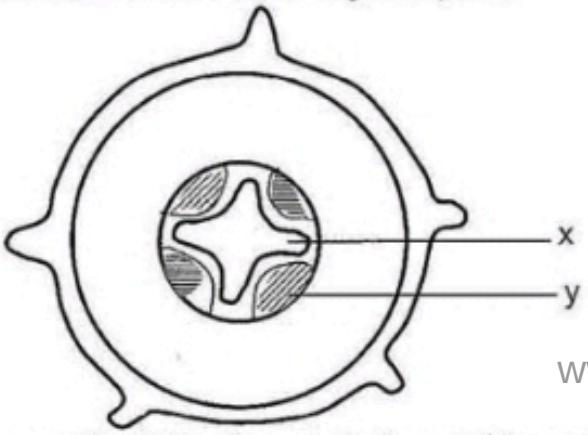
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.

1 The diagram shows a cell taken from a green healthy plant.



Which of the labelled structures A, B, C and D is responsible for glucose synthesis?

2 The diagram shows the tissues in the root of a green plant.



Which of the following correctly states the adaptation and hence function of either tissue x or tissue y?

	Adaptation	Function
A	x has sieve tubes and cytoplasm	Conducts food
B	x has lignified wall	Conducts water
C	y is hollow with no cytoplasm	Conducts water
D	y has sieve tubes	Conducts food

3 In preparing a microscopic slide of blood cells, a biologist added a few drops of water around. Under the microscope, the cells were observed to have burst. Which of these is the possible explanation of the observation?

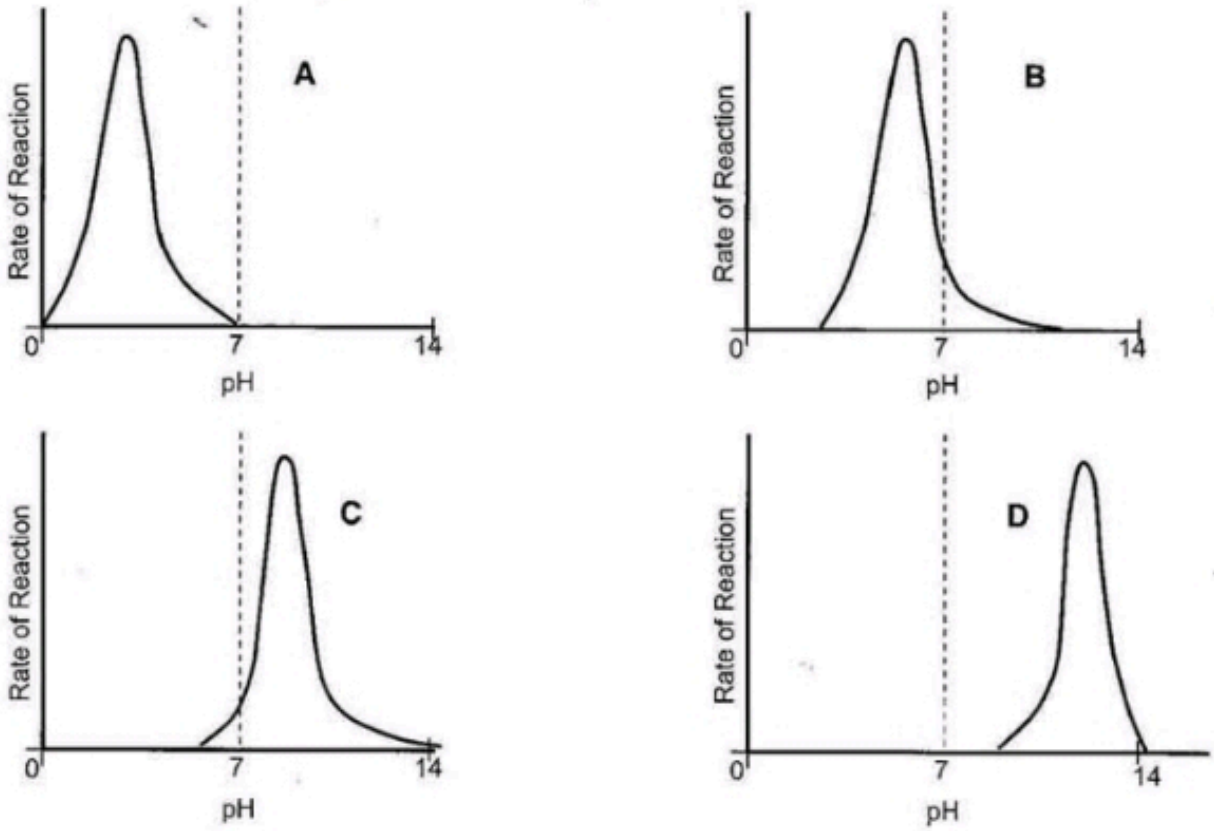
A Use of distilled water

B Use of concentrated water

C Addition of water too rapidly

D Use of dead cells.

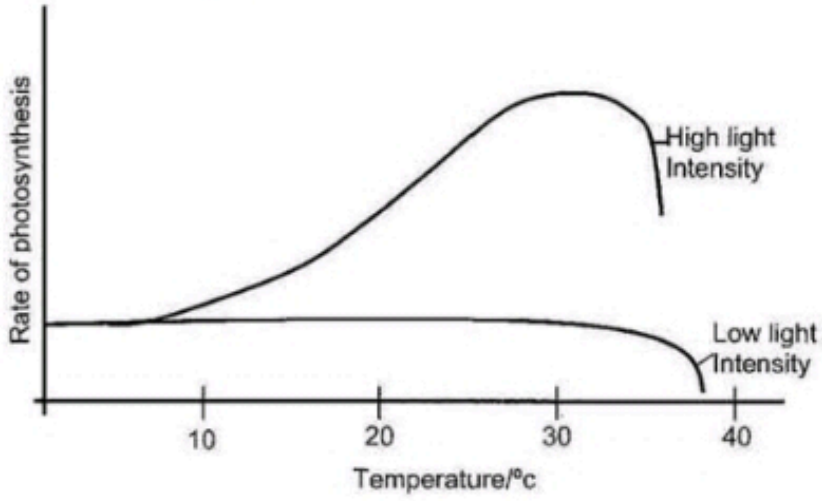
4 Which of these graphs show how pH affects the rate of protein digestion by pepsin?



5 Which of the following foods should be given to a person suffering from easily bruised skin?

A Oranges
B Milk
C Beans
D Bananas

6 The diagram below shows the effect of temperature on the rate of photosynthesis at low and high light intensities.



The graphs show that increasing temperature had little effect under low light intensity while increasing temperature under high light intensity increased the rate of photosynthesis. Which of the following could be the possible reasons for this?

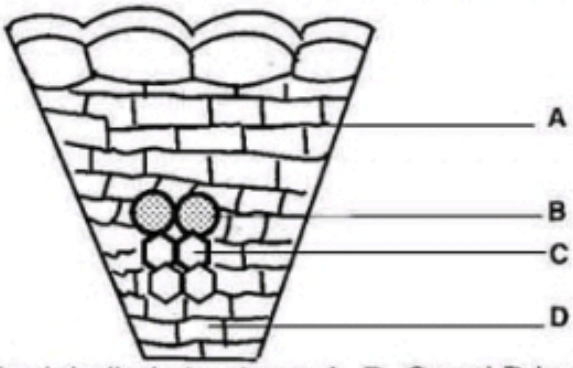
A Low light intensity is not able to stimulate enzymes.

B Low light intensity results in stomata closure.

C High light intensity provides less heat for the reaction.

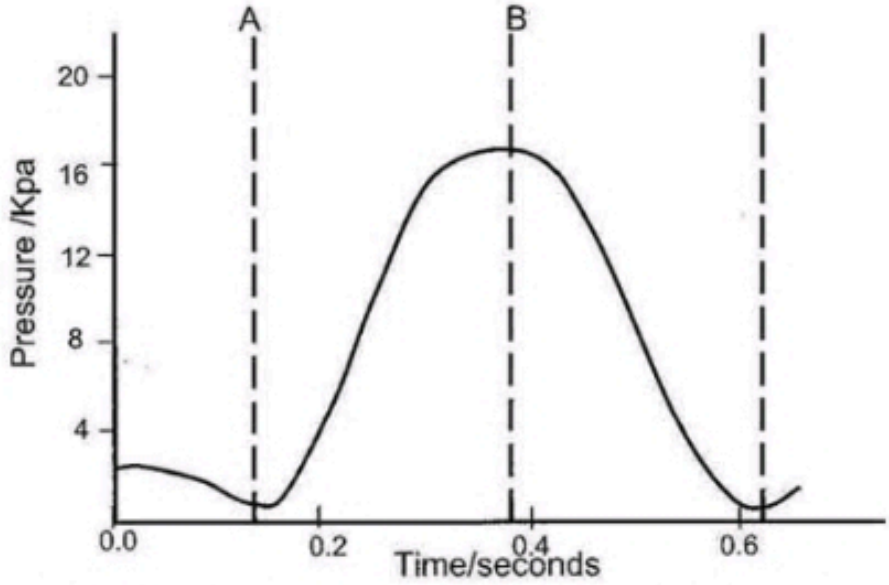
D High light intensity provides enough energy for splitting the water molecules.

7 The diagram below shows a section of a dicot stem.



Which of the labelled structures A, B, C and D is responsible in supporting the stem?

8 The graph below shows pressure changes in the ventricles of the heart during a single beat.



Which of the statements below correctly describes what happens to the valves during the period A – B?

A Pulmonary valves close.

B Aortic valve opens

C Semi-lunar valves close.

D Cuspid valves open

9 Which of the following blood vessels do not have valves?

A Aorta

B Pulmonary artery

C Renal artery

D Vena Cava

10 The table below shows the pH values surrounding the teeth of a person over a period of five hours.

	Time/h	pH
A	08:00 hrs	8.1
B	09:00 hrs	5.9
C	11:00 hrs	5.0
D	12:00 hrs	3.9

At what time did this person brush his/her teeth?

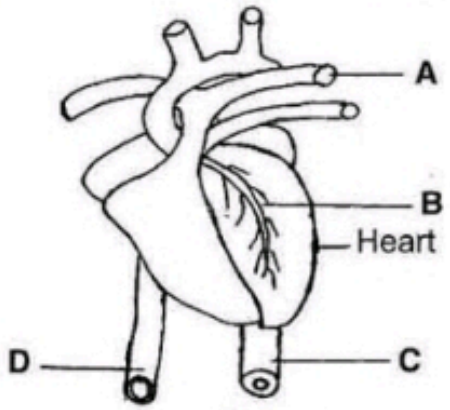
11 Which of the following digestive processes take(s) place in the stomach?

	Chemical Digestion	Physical Digestion
A	✓	✓
B	✓	x
C	x	✓
D	x	x

Key:

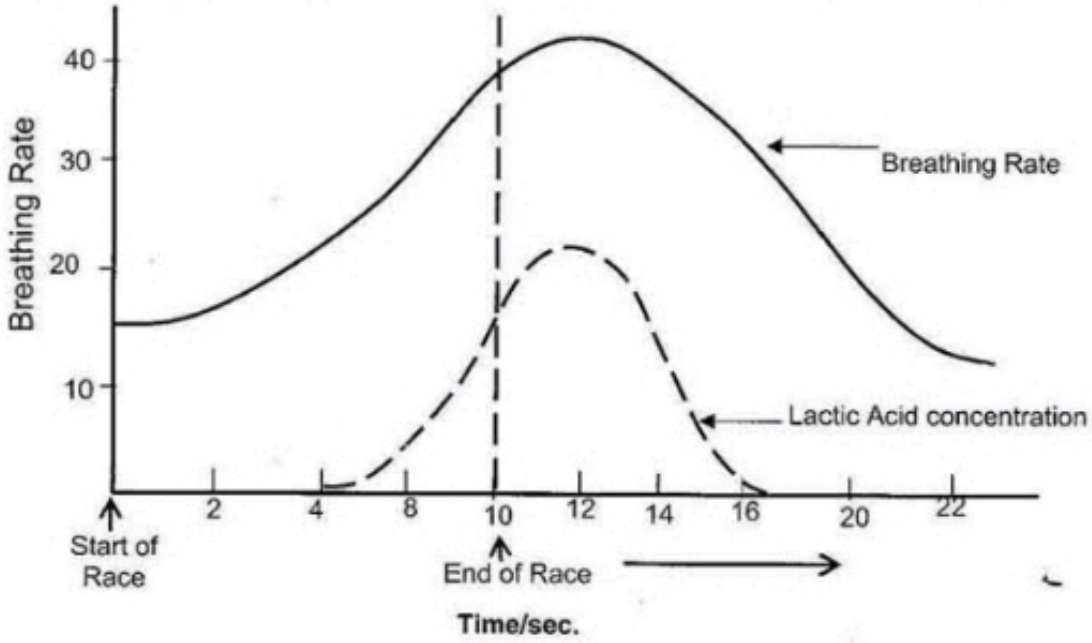
✓ = Present
x = Absent

12 The diagram below shows an external view of the heart.



Which of the labelled blood vessels contains blood with the least pressure?

13 The graph below shows the change in the breathing rate of a person running in a 100m race.



If the 100m race was completed after 10 seconds, which of the following explains why the breathing rate remained high for a good 3 seconds after the race?

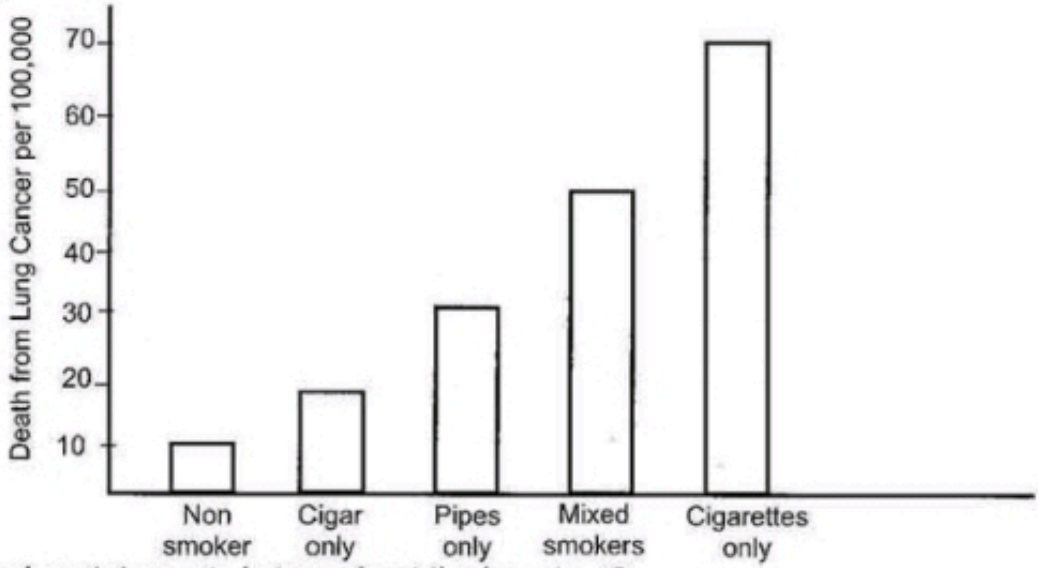
A Because of increased demand for oxygen.

B Because of increased production of carbon-dioxide.

C Because of increased usage of glucose.

D Because of increased production of lactic acid.

14 The bar chart shows the numbers of people aged between 40 and 49 years who die from lung cancer.



Which of the following statements is true about the bar chart?

A Non smokers are free from lung cancer.

B Only cigarette smoking can cause lung cancer.

C Smokers of cigars are at less risk of suffering from lung cancer than mixed smokers.

D Mixed smokers are at a higher risk of suffering from lung cancer than cigarette smokers.

15 Which of the following structures hold the humerus to the radius?

A Tendon
B Ligament
C Synovial membrane
D Cartilage

16 What is the fate of the excess amino acids which are assimilated by the alimentary canal?

A Excreted by the liver
B Used for body building
C Stored in the liver and muscles
D Deaminated in the liver

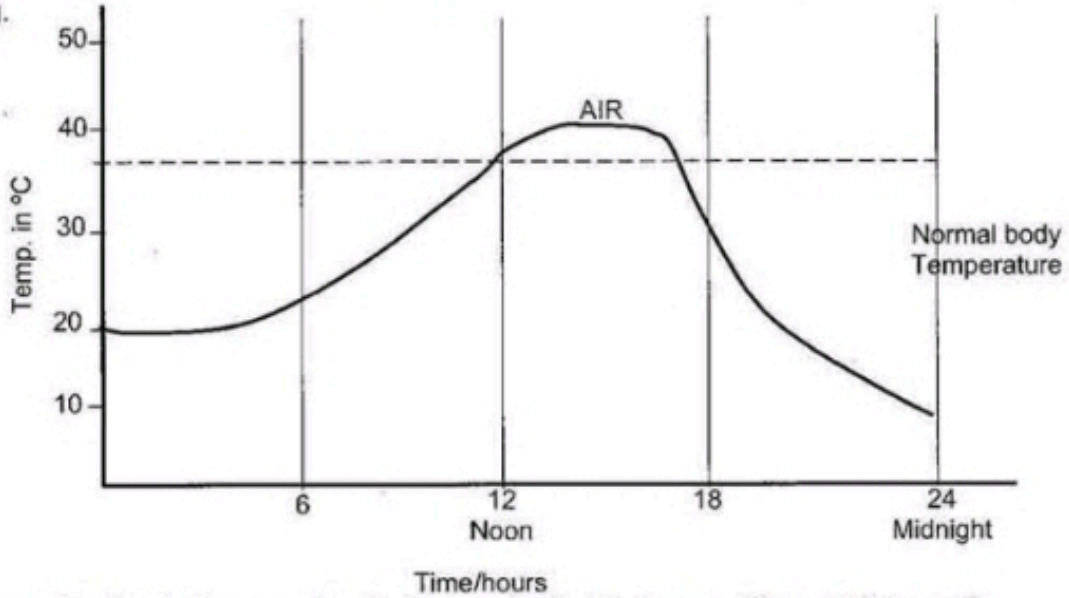
17 Which part of the brain helps to regulate the body temperature in mammals?

A Pituitary body
B Hypothalamus
C Medulla oblongata
D Cerebellum

18 Which of the following is likely to be one of the reasons for osmoregulation in man?

A It protects the cells from bursting.
B It controls osmosis in cells.
C It helps in absorption of digested food.
D It prevents loss of water.

19 The graphs below show the air temperature and the body temperature of a human being.



How was the body temperature being controlled between 12 and 18 hours?

A Through sweating
B Through vasoconstruction
C Through shivering
D Through hair standing on ends

20 Which of the following is a function of a relay neurone?

A Transmits impulses to the sensory neurone.

B Conducts impulses from the spinal cord to the brain.

C Conducts impulses from sensory neurone to motor neurone.

D Receives impulses from the motor neurone.

21 The table below shows the diameter of the lens for a person looking at a moving object.

	Diameter (arbitrary units)
Initial ↓ Final	20 14 9 5

Which of the following best describes why the diameter of the lens was changing?

A Ciliary muscles were contracting as the object moved away.

B Ciliary muscles were relaxing as the object moved away.

C Radial muscles were contracting as the object moved closer.

D Radial muscles were relaxing as the object moved closer.

22 A coleoptile exposed to light on one side only will be observed to be growing towards the light source after a few days.

Which of these best explains the observation?

	Auxin concentration	**Effect**
A	More on illuminated side	Cells elongate more rapidly
B	More on shaded side	Cells elongate more rapidly
C	Less on illuminated side	Promotes cell elongation
D	Less on shaded side	Retards cell elongation

23 The table below shows the different effects of drugs on the human body.

	Depressant	May cause Addiction	Damages Brain	Increase in Reaction time
A	x	✓	✓	✓
B	x	✓	x	x
C	✓	x	✓	✓
D	✓	✓	✓	✓

Which of these effects are caused by alcohol?

24 Which statements about virus and bacteria are **not** correct?

	Virus	Bacteria
A	Have a nucleus	Have a Nucleus
B	Not used in food production	Used in food production
C	Causes disease	Causes disease
D	Have D.N.A.	Have D.N.A.

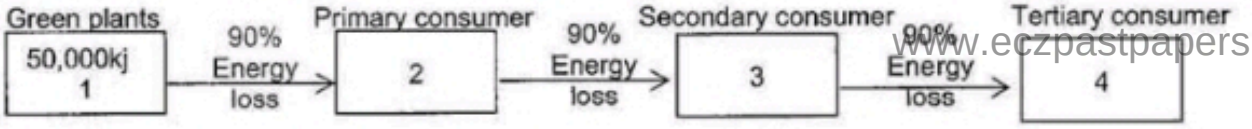
25 The diagram below shows a simple food chain commonly found in fresh water ponds.

Microscopic plants ⟶ Water fleas ⟶ Fish

Which of the following could represent correctly, the relative amounts of biomass present in the food chain?

	Microscopic plants	Water fleas	Fish
A	5g	15g	60g
B	30g	60g	15g
C	60g	5g	30g
D	60g	30g	5g

26 The diagram below shows the energy flow through a food chain.



What is the total energy in box number 4?

A 5000 kJ

B 500 kJ

C 50 kJ

D 5 kJ

27 Which of the following is the main reason for conserving plants?

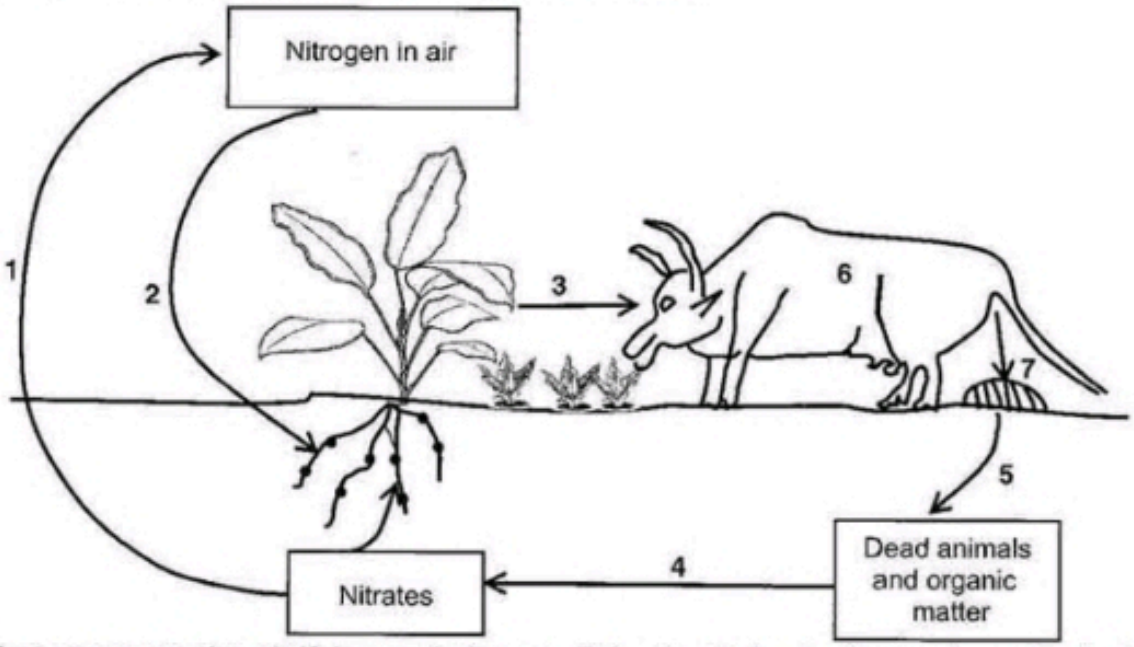
A Provision of drugs

B Balance of carbon dioxide

C Source of rubber

D Extraction of oils

28 The diagram below shows part of the Nitrogen cycle.



At what stage are the nitrifying and nitrogen fixing bacteria playing an important role?

	Nitrifying bacteria	Nitrogen fixing bacteria
A	Stage 1	Stage 3
B	Stage 7	Stage 4
C	Stage 4	Stage 2
D	Stage 5	Stage 2

29 Which of the following explains how spraying of oil and insecticides on stagnant water helps to reduce the spread of malaria?

A Suffocates the larvae and pupae.

B Kills the mosquito.

C Destroys the eggs.

D Suffocates the plasmodium.

30 Which of these pollutants are non-biodegradable?

A Detergents

B Faeces

C Plastics

D Dead plants

31 The table shows organisms in a food chain and the amount of its biomass.

	Organism	Amount of Biomass (Arbitrary)
A	w	880
B	x	720
C	y	1 020
D	z	650

If an insecticide was sprayed, in which of these organisms would it accumulate most?

32 Which of the following is an adaptation of self dispersal seeds?

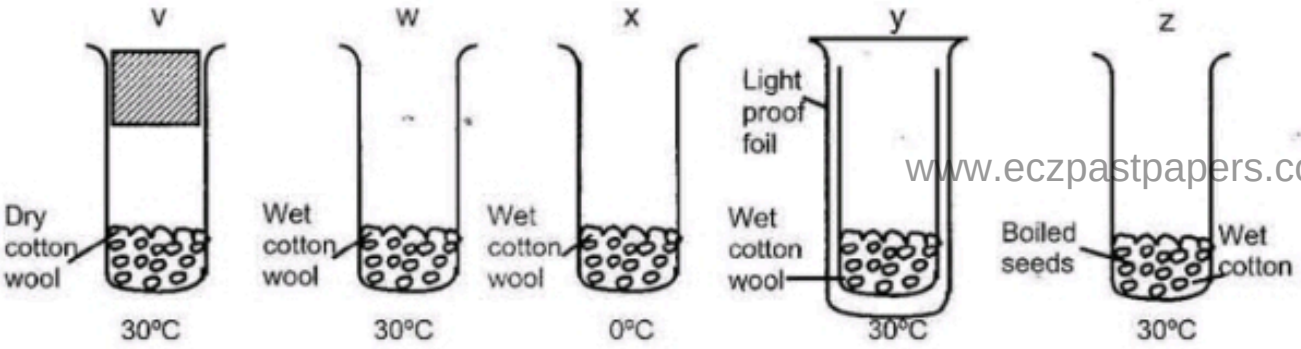
A Hooks present on pericap

B Large fleshy receptacle

C Parachute of hairs

D Fibres in fruit walls

33 An experiment was set up to investigate the germination of barley seeds as shown in the diagrams below.



In which two test tubes would the seeds germinate most rapidly?

A W and X

B V and Z

C Y and X

D W and Y

34 What will be the effect of removing the prostrate gland in man?

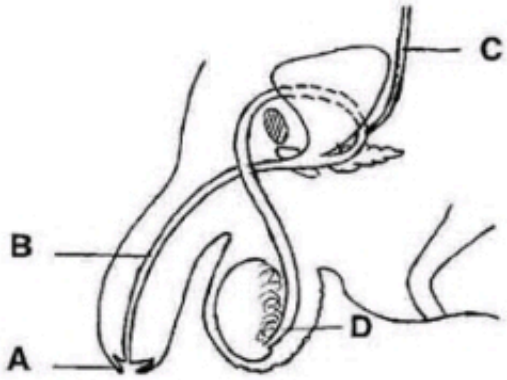
A Sperms will not be stored inside the body.

B Semen would have less nutrients and enzymes.

C Sperm production will be slowed down.

D Secretion of male hormones will be stopped.

35 The diagram below shows a side view of the male reproductive system.



Which part is severely affected resulting in sterility, when a person has contracted gonorrhoea?

36 In some females the uterus can be removed due to illness. Which of the following best explains why such females cannot become pregnant?

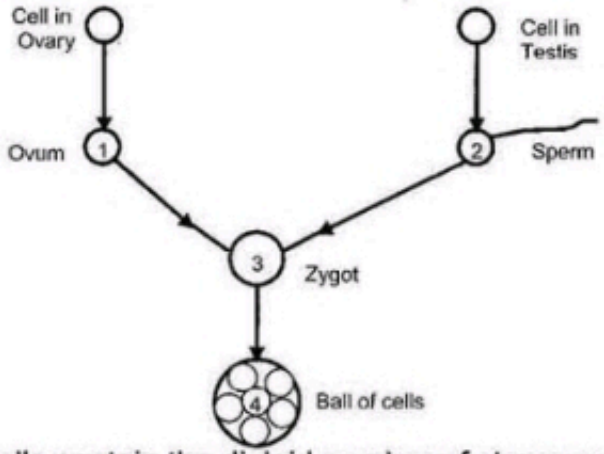
A Ovulation stops.

B Menstrual periods stop.

C Zygote cannot get implanted.

D Ovum cannot mature.

37 The diagram below shows the initial stages in reproduction.



Which cells contain the diploid number of chromosome?

A 1 and 2

B 2 and 3

C 1 and 3

D 3 and 4

38 A man and his wife, both of blood group A, had three sons, the two eldest sons were of blood group A and the youngest son was of blood group O. What were the genotypes of the man and his wife?

	Husband	Wife
A	AA	AB
B	AA	AO
C	AO	AO
D	AA	OO

39 A heterozygous tall plant is crossed with another heterozygous tall plant to produce 600 plants. How many of these plants were tall?

A 150

B 300

C 450

D 600

40 Which of the following is a cause of sickle cell anaemia?

A Change in chromosome number.

B Change in structure of the haemoglobin molecule.

C Lack of Oxygen in the red blood cell.

D Insufficient haemoglobin in the red blood cell.