



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 structures are found in a human sperm cell?

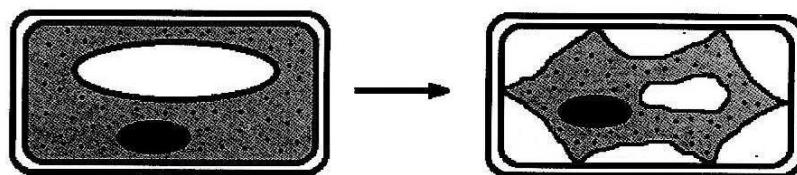
	Cell Membrane	Cell Wall	Haploid Nucleus
A	✓	X	X
B	✓	X	✓
C	✓	✓	✓
D	X	✓	✓

Key

✓ Present

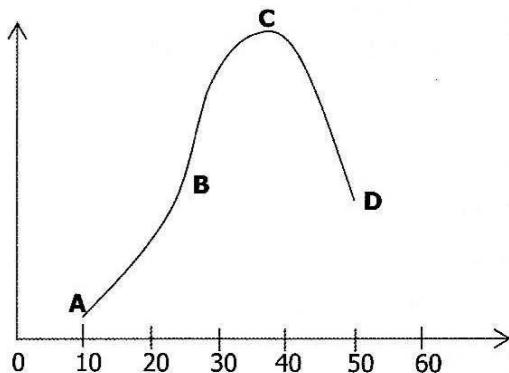
X Absent

- 2** The diagram illustrates the effect of osmosis on a plant cell that has been placed in liquid Q for several minutes.



What type of liquid is Q?

- A** Distilled water
B Hypertonic solution
C Hypotonic solution
D Isotonic solution
- 3** The graph shows the effect of temperature on a chemical reaction which was controlled by enzymes.



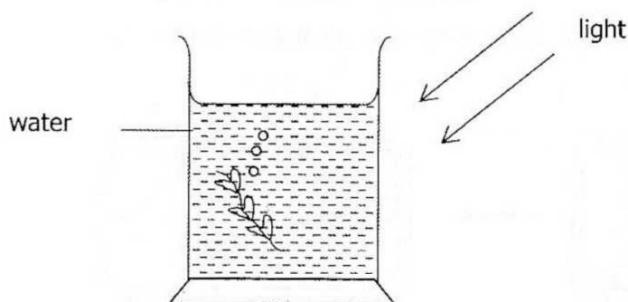
At which point are most product molecules formed?

- 4** An organism being examined under a microscope was found to have three body parts and three pairs of legs.

To which class of organisms does it belong?

- A** Arachnida
- B** Arthropoda
- C** Diplopoda
- D** Insecta

- 5** The diagram shows a photosynthesising water plant. The rate of photosynthesis is measured by bubbles of gas released.



Which factor in the water was limiting?

- A** Carbon dioxide
- B** Chlorophyll
- C** Light
- D** Water

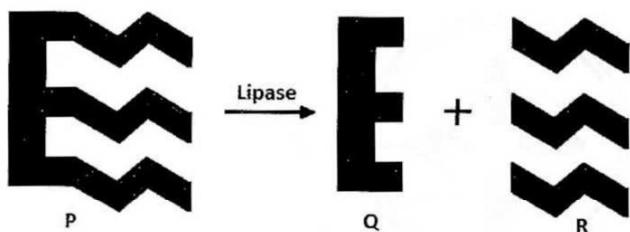
- 6** The table shows the results of two food samples that were tested.

Sample	Iodine Solution	Benedict's Solution	Biuret Reagent
1	Brown	Orange	Blue
2	Blue/black	Blue	Violet

What do these results show?

- A** Sample 1 contains starch and sugars
- B** Sample 1 contains starch only.
- C** Sample 2 contains starch and protein.
- D** Sample 2 contains protein only.

- 7 The following diagram shows the break down of a nutrient.



Which of the following identifies **P**, **Q** and **R**?

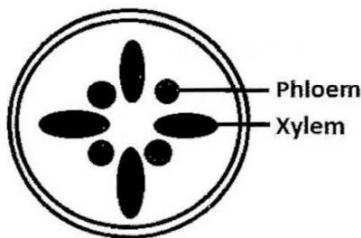
	P	Q	R
A	Carbohydrate	Glucose	Fructose
B	Protein	Amino acid	Urea
C	Lipid	Glycerol	Fatty acid
D	Fats	glucose	Glycerol

- 8 What is the total number of teeth on the upper jaw of a rat with the dental formula

$$i \frac{1}{1} =, c \frac{0}{0}, pm \frac{0}{0}, m \frac{3}{3}$$

- A** 4
B 8
C 16
D 32

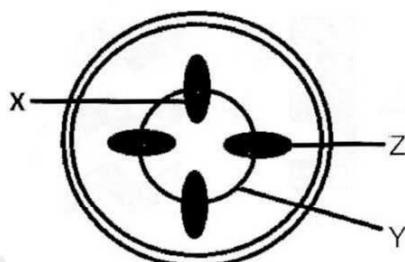
- 9 The diagram represents a cross section of a part of a plant.



From which part of the plant was this section cut?

- A** dicotyledonous root
B dicotyledonous stem
C monocotyledonous root
D monocotyledonous stem

- 10** The diagram below shows a section through a part of a plant.



Which part(s) are responsible for transport of amino acids and sucrose?

	Amino acids	Sucrose
A	X	X
B	X	Z
C	Z	Z
D	Z	X

- 11** A green plant starts to wilt. It is then watered, and after a short time it recovers.

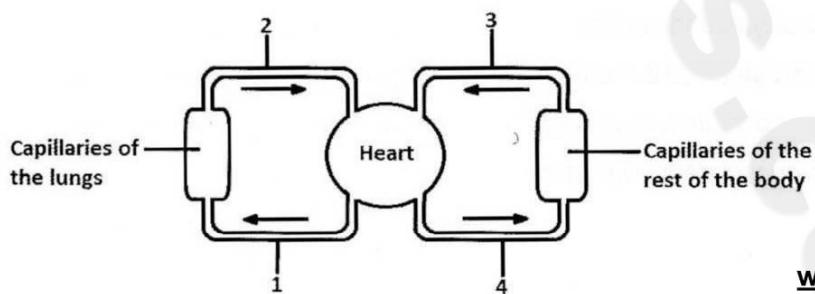
What process causes this recovery?

- A** Assimilation
- B** Active transport
- C** Respiration
- D** Transpiration

- 12** When the skin is cut, the blood clots. In which order would the components of blood become involved?

- A** Fibrin → platelets → red blood cells → fibrinogen
- B** fibrinogen → red blood cells → platelets → Fibrin
- C** platelets → Fibrin → fibrinogen → red blood cells
- D** platelets → fibrinogen → Fibrin → red blood cells

- 13** The diagram below shows a double circulatory system.



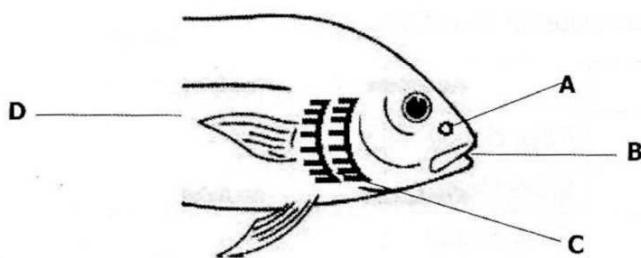
Which vessels carry oxygenated blood?

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

14 Which feature of the alveolus decreases the distance over which oxygen and carbon dioxide molecules diffuse?

- A** Each alveolus has a large blood supply.
- B** Each alveolus is only 0.2mm in diameter.
- C** There are numerous alveoli in the lungs.
- D** The walls of the alveoli are only one-cell thick.

15 The diagram below shows the respiratory organs in fish.



In which of the labelled parts does gaseous exchange take place?

16 The table below shows the aspects of respiration.

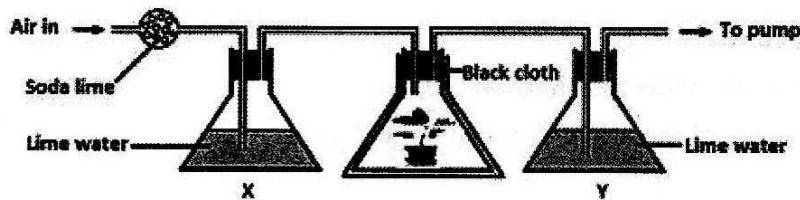
Which row is correct for anaerobic respiration in plants?

	Amount of energy released per glucose molecule	Alcohol	Carbon dioxide
A	High	Produced	Not produced
B	Low	Produced	Produced
C	High	Not produced	Produced
D	Low	Not produced	Not produced

- 17** Chemicals in tobacco smoke lead to the break down of the tissue of the alveoli walls. What name is given to this condition?

- A** Bronchitis
- B** Emphysema
- C** Heart disease
- D** Lung Cancer

- 18** The apparatus below demonstrates the process of respiration.



What happens to the lime water in X and Y?

	X	Y
A	Goes cloudy	Goes cloudy
B	Goes cloudy	Stays clear
C	Stays clear	Goes cloudy
D	Stays clear	Stays clear

- 19** Which conditions are necessary for the germination of most seeds?

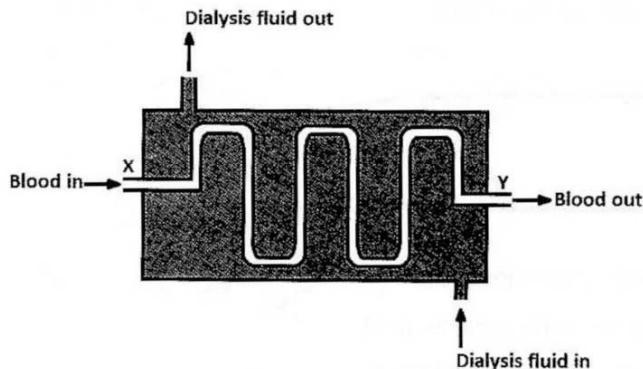
	Light	Oxygen	Water
A	✓	✓	X
B	X	✓	X
C	✓	✓	✓
D	X	✓	✓

Key

✓ = necessary

X = not necessary

- 20** The diagram shows a simple dialysis machine.

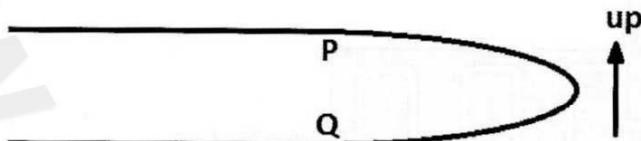


The substance in blood at **X** which should not be found in blood at **Y** is ...

- A** amino acids.
 - B** fatty acids.
 - C** glucose.
 - D** urea.
- 21** Which of the following is excreted by plants only?
- A** Alkaloids
 - B** Carbon dioxide
 - C** Excess salts
 - D** Urea
- 22** When a person is cold, nerve impulses from the hypothalamus cause the skin to reduce the rate of heat loss. What is the effect of these nerve impulses on the hair erector muscle and the arterioles near the skin surface?

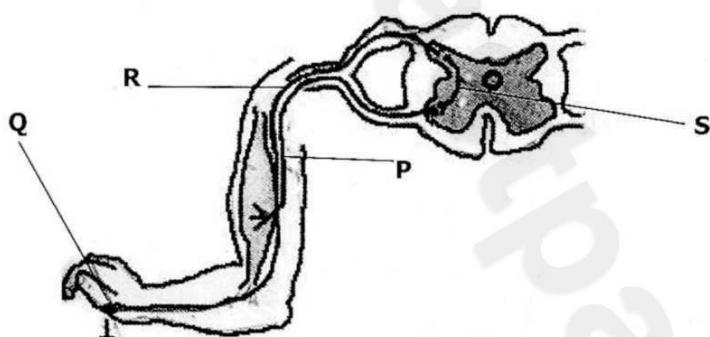
	Hair erector muscle	Arterioles near skin surface
A	Contract	Constrict
B	Contract	Dilate
C	Relax	Constrict
D	Relax	Dilate

- 23 The diagram shows a shoot which has been placed horizontally. The shoot begins to grow upwards.



What causes the shoot to grow upwards?

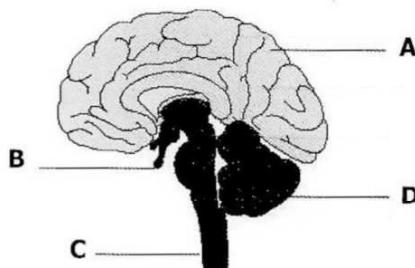
- A increased cell division by meiosis at **P**.
 - B Increased cell division by mitosis at **P**.
 - C More cell elongation at **P** than at **Q**.
 - D More cell elongation at **Q** than at **P**.
- 24 The diagram shows the structures involved in a reflex action.



The correct sequence of an impulse through these structures is

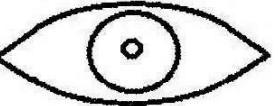
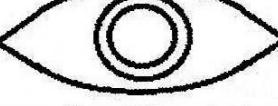
- A **P** → **Q** → **R** → **S**
- B **P** → **S** → **R** → **Q**
- C **Q** → **R** → **S** → **P**
- D **Q** → **S** → **P** → **R**

- 25 The diagram below shows a cross section through the brain.



Which part is the centre for processes such as thought, memory and judgement?

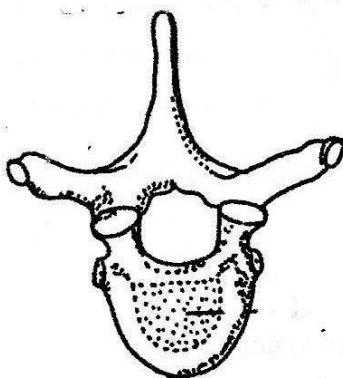
- 26 Which of the following shows the appearance of the iris and pupil of the eye when viewing an object in dim light?

	Front view of iris and pupil	Circular muscles in iris
A		Contracts
B		Relaxes
C		Relaxes
D		Contracts

- 27 Which **two** bones form the ball and socket joint of the shoulder?

- A Femur and pelvic girdle
- B Femur and Tibia
- C Humerus and Scapula
- D Ulna and Humerus

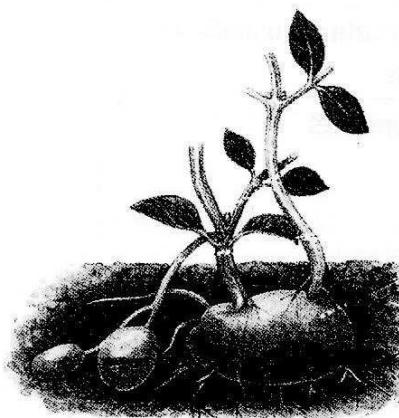
- 28 The diagram below shows a vertebra.



To which region of the vertebral column does it belong?

- A Cervical
- B Lumbar
- C Thoracic
- D Sacral

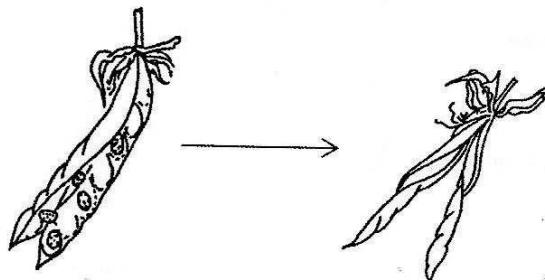
- 29** The diagram shows Irish potatoes in natural vegetative propagation.



What type of vegetative organ is shown.

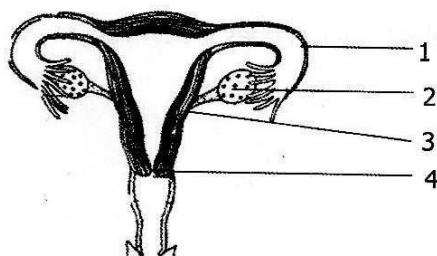
- A** Bulb
- B** Corm
- C** Root tuber
- D** Stem tuber

- 30** What type of seed dispersal is shown in the diagram?



- A** Animal dispersal
- B** Self dispersal
- C** Water dispersal
- D** Wind dispersal

- 31** The diagram shows the female reproductive system.



In which numbered parts does ovulation, fertilization and implantation occur?

	Ovulation	Fertilization	Implantation
A	1	2	3
B	2	1	3
C	2	1	4
D	3	2	4

- 32** Which one of the following is a hormonal and which one is a mechanical method of contraception?

	Hormonal	Mechanical
A	Condom	Spermicide
B	Condom	Intra Uterine Device
C	Pill	Spermicide
D	Pill	Intra Uterine Device

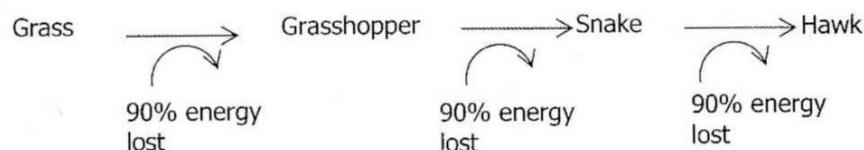
- 33** How is Bilharzia transmitted?

- A Inhaling contaminated air.
- B Shaking hands with an infected person.
- C Swimming in contaminated water.
- D Walking bare foot on the ground.

- 34** BCG vaccination against tuberculosis is an example of ...

- A artificial active immunity.
- B natural active immunity
- C natural immunity.
- D natural passive immunity.

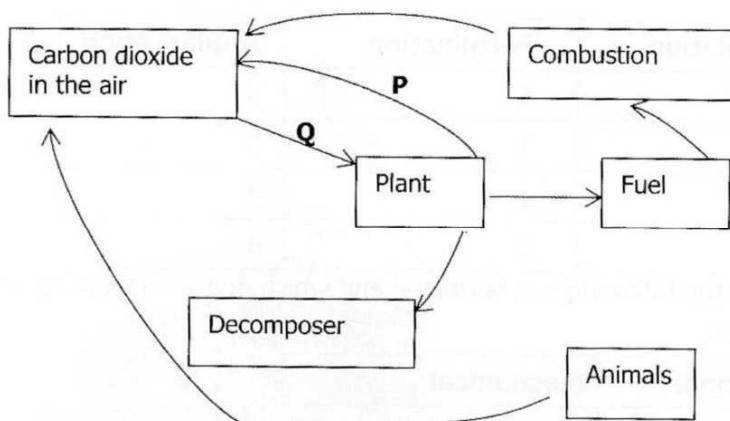
- 35** The diagram below shows a food chain. The grass receives 10 000KJ of energy from the sun.



How much energy would the Hawk receive after eating the snake?

- A 1KJ
- B 10KJ
- C 100KJ
- D 1000KJ

- 36** The diagram shows the carbon cycle.

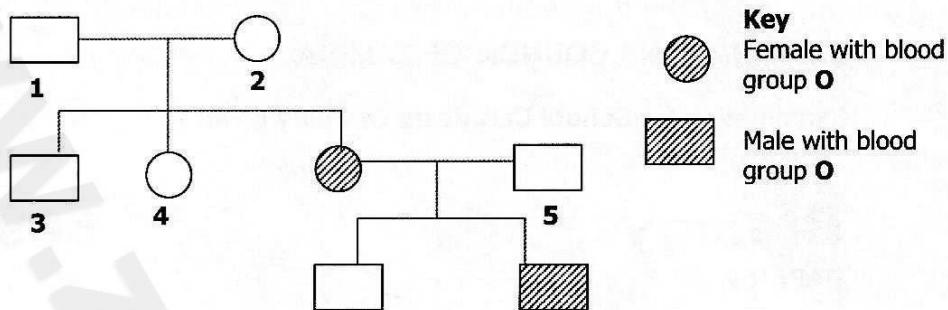


What processes are represented by **P** and **Q**?

P	Q
A Photosynthesis	Photosynthesis
B Photosynthesis	Respiration
C Respiration	Respiration
D Respiration	Photosynthesis

- 37** Which of the following effect of man on the ecosystem is reduced by proper treatment of sewage?
- A Acid rain
 - B Death of fish due to lack of oxygen
 - C Increase in Carbon dioxide in atmosphere
 - D Lack of soil nutrients
- 38** Which of the following human features is an example of continuous variation?
- A Blood group
 - B Foot size
 - C Sex
 - D Types of teeth

- 39** The diagram shows a family tree of two parents both of blood group A.



What are the genotypes of persons **1**, **2** and **5**?

	1	2	3
A	I ^A I ^A	I ^A I ^A	I ^A I ^A
B	I ^A I ^O	I ^A I ^A	I ^A I ^O
C	I ^A I ^O	I ^A I ^O	I ^A I ^O
D	I ^A I ^O	I ^A I ^O	I ^A I ^A

- 40** A person with Down's Syndrome is born with 47 chromosomes in each of his or her cells instead of 46. What could cause this?
- A** A mutation happened during the production of the ovum
 - B** More than one sperm fused with ovum at fertilization
 - C** Radiation caused a change in structure of gene in the father's sperm
 - D** The mother was exposed to harmful chemicals while she was pregnant.



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