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 **8 OCTOBER 2013**

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.

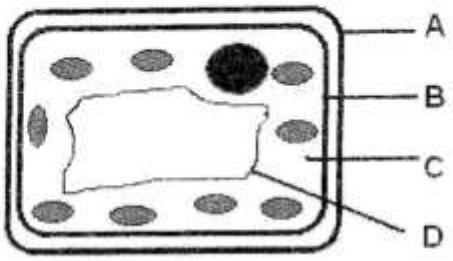
Read very carefully the instructions on the Answer Sheet.

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 The diagram below shows a plant cell.



Which labelled part controls the movement of substances into and out of the cell?

2 Enzymes ...

A work only inside living cells.

B are made of lipids.

C speed up chemical reactions.

D are not denatured by high temperatures.

3 Which of the following have cells with cell walls?

A Arthropoda

B Fungi

C Protista

D Viruses

4 Which of the following is the correct word equation for photosynthesis?

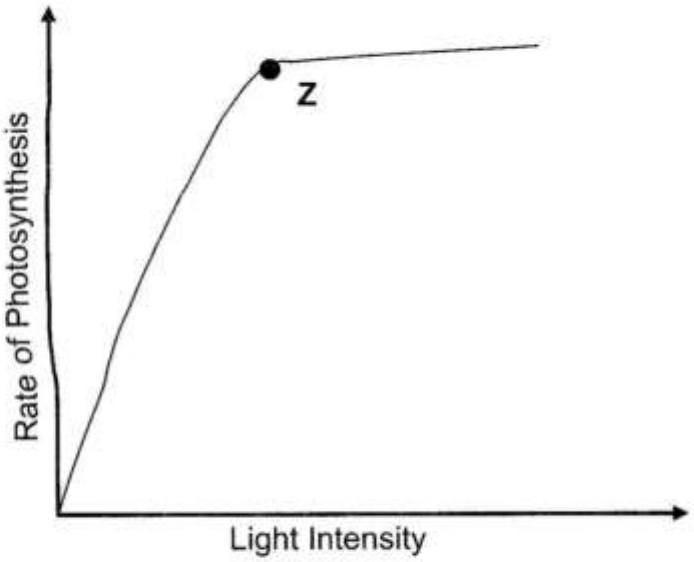
A $\text{Carbohydrate + oxygen} \xrightarrow[\text{chlorophyll}]{\text{light energy}} \text{water + carbon dioxide}$

B $\text{Carbohydrate + water} \xrightarrow[\text{chlorophyll}]{\text{light energy}} \text{oxygen + carbon dioxide}$

C $\text{Carbon dioxide + water} \xrightarrow[\text{chlorophyll}]{\text{light energy}} \text{carbohydrate + oxygen}$

D $\text{Carbon dioxide + oxygen} \xrightarrow[\text{chlorophyll}]{\text{light energy}} \text{carbohydrate + water}$

5 The graph below shows the results of an experiment measuring the rate of photosynthesis in a pond plant at different light intensities.



Which of the following are the limiting factors in this experiment at point **Z**?

A Carbon dioxide and temperature

B Light intensity and water

C Temperature and water

D Water and carbon dioxide

6 The table below shows four different diets.

Diets	Carbohydrates	Vitamin C	Proteins	Iron
A	✓	x	✓	x
B	x	✓	✓	x
C	✓	x	x	✓
D	✓	✓	x	✓

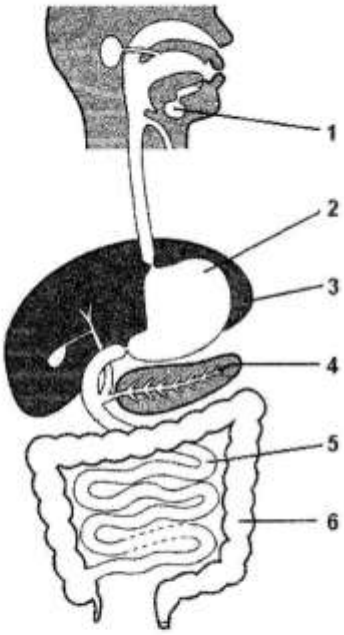
KEY

✓ Nutrient available in diet

x Nutrient not available in diet

Which diet would cause an individual to suffer from scurvy and anaemia?

7 The diagram below shows the alimentary canal and associated structures.



Which numbered structures produce digestive enzymes?

A 1, 2, 3, 6
B 1, 2, 4, 5
C 2, 3, 4, 5
D 2, 4, 5, 6

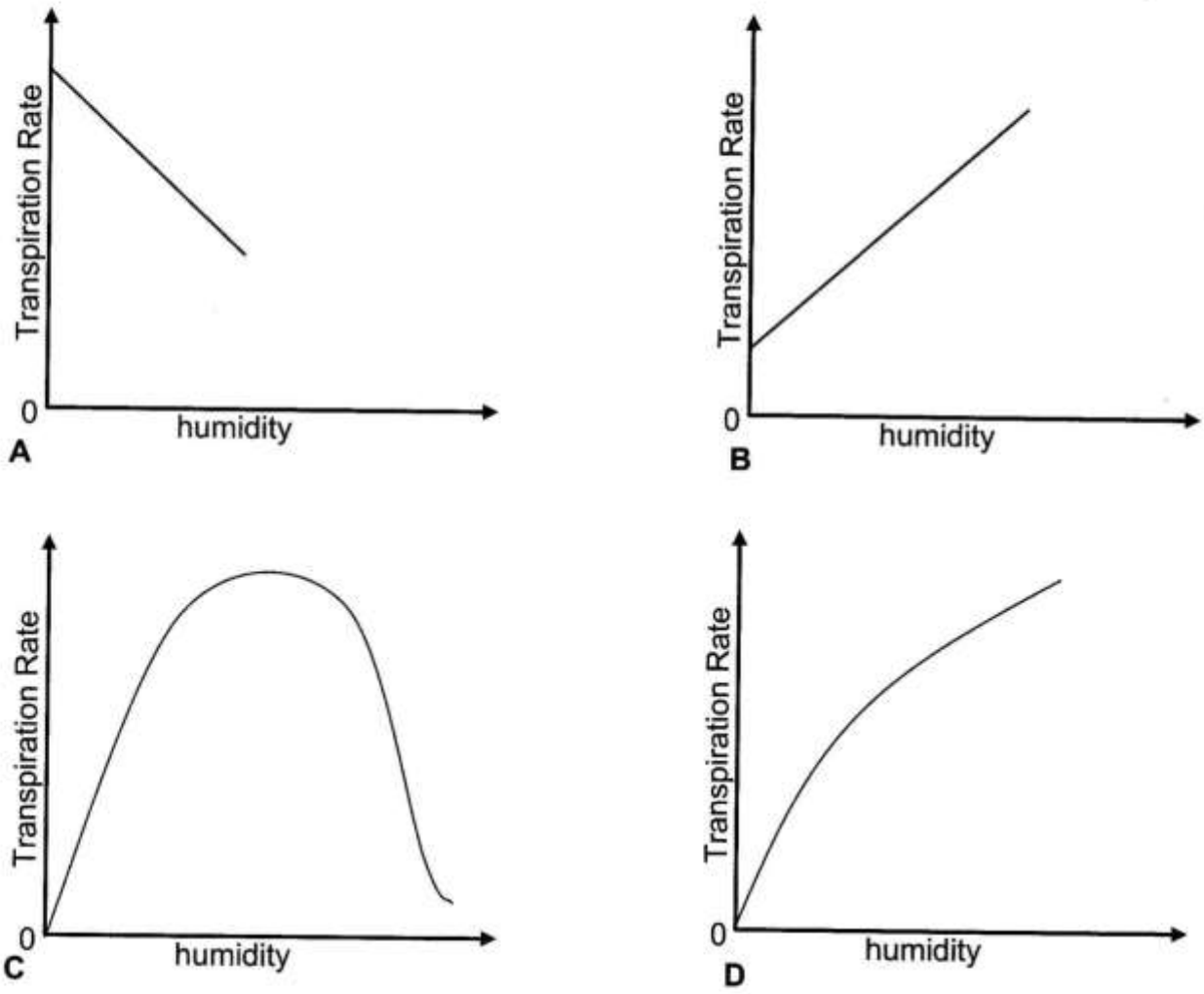
8 What is the name and function of the tooth illustrated below?

	Name	Function
A	Canines	Tearing off flesh
B	Canines	Biting and cutting of food
C	Incisors	Biting and cutting of food
D	Molar	Crushing and grinding food

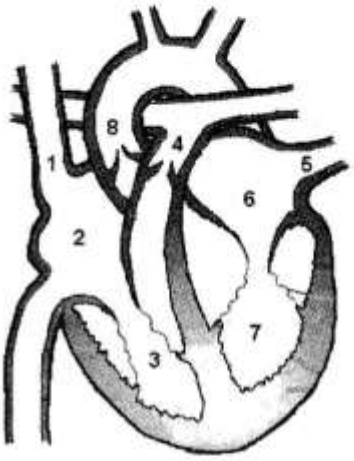
9 During translocation in plants, substance **X** is moved from organ **Y** to organ **Z**. What is **X**, **Y** and **Z**?

	X	Y	Z
A	Sucrose	Anther	Stigma
B	Sucrose	Leaf	Root
C	Water	Root	Leaf
D	Water	Soil	Hair

10 Which diagram below shows the effect of increasing humidity on the transpiration rate of a plant?



11 The diagram below shows a section through the human heart.



Which sequence shows the flow of deoxygenated blood through the heart?

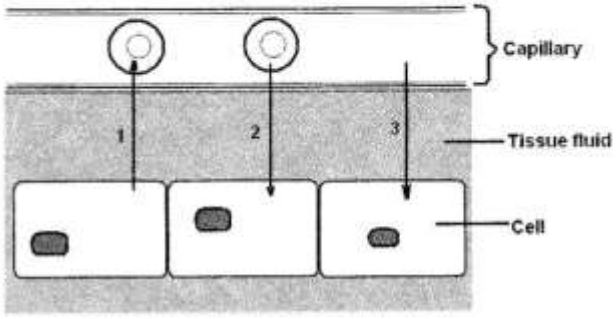
A 1 → 2 → 3 → 4

B 4 → 3 → 2 → 1

C 5 → 6 → 7 → 8

D 8 → 7 → 6 → 5

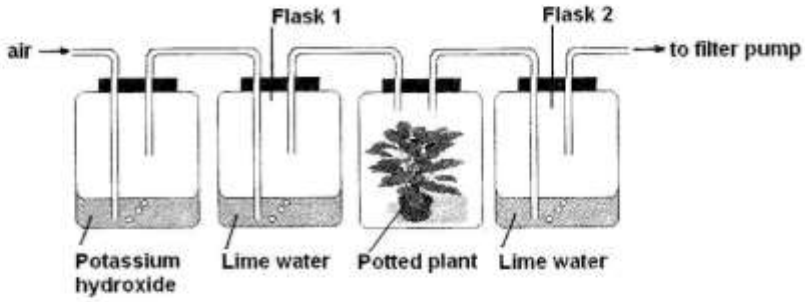
12 The diagram below represents a blood capillary in the leg with adjacent cells. Arrows represent movement of substances between blood and cells.



Which arrows represent glucose, carbon dioxide and oxygen?

	Carbon dioxide	Oxygen	Glucose
A	1	2	3
B	1	3	2
C	2	1	3
D	2	3	1

13 The diagram below was set up to demonstrate respiration in plants.



Which changes would occur to flask 1 and flask 2 after two hours of experiment?

	Flask 1	Flask 2
A	remained colourless	remained colourless
B	remained colourless	turned milky
C	turned milky	turned milky
D	turned milky	remained colourless

14 The table below shows the percentage of a gas in inspired and expired air in human beings.

Inspired air	Expired air
20%	16%

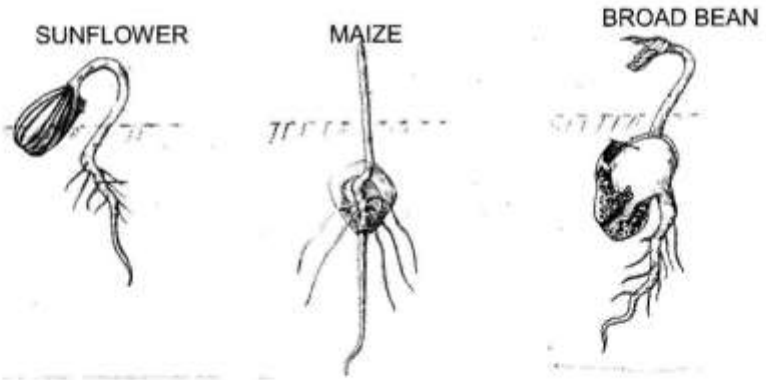
What gas is being referred to?

A Carbon dioxide
B Nitrogen
C Oxygen
D Water Vapour

15 Which of the events occur during inspiration in a fish?

	Floor of mouth	Operculum	Movement of water
A	lowered	closed	enters
B	lowered	opened	comes out
C	raised	closed	enters
D	raised	opened	comes out

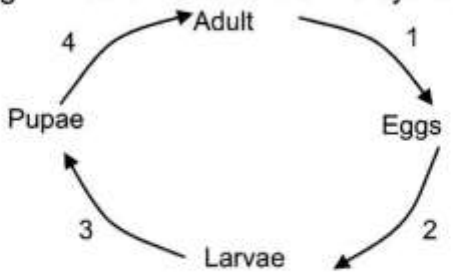
16 The diagrams below show germinating seedlings.



What types of germination are illustrated?

	Maize	Sunflower	Broad bean
A	Epigeal	Hypogeal	Epigeal
B	Epigeal	Epigeal	Hypogeal
C	Hypogeal	Epigeal	Hypogeal
D	Hypogeal	Hypogeal	Epigeal

17 The diagram below shows the life cycle of a mosquito.



Which stage transmits pathogens?

A Adult
B Eggs
C Larvae
D Pupa

18 During a long distance race the body temperature of an athlete begins to rise. Which of the following changes occur in the body to help return the body temperature to normal?

	Sweating	Blood vessels in the skin
A	Increases	Constrict
B	Increases	Dilate
C	Decreases	Dilate
D	Decreases	Constrict

19 What is the level of urea in blood leaving the liver and in urine leaving the kidneys after a person has had a high protein intake?

	Level of urea in blood leaving liver	**Level of urea in urine leaving kidneys**
A	high	low
B	high	high
C	low	high
D	low	low

20 Where in the plant is auxin made and what is its effect on the plant?

	Where made	**Effect**
A	Leaves	Promotes cell elongation
B	Root tip	Promotes cell elongation
C	Shoot tip	Promotes leaf enlargement
D	Stem	Promotes secondary growth

21 Which of these plant responses are phototropic?

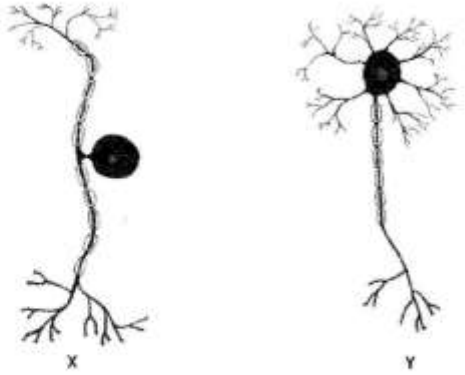
A A leaf of Venus fly-trap catches a fly that walks on it.

B Daisies open in the morning and close as the sun sets.

C The shoot of an indoor plant grows in the direction of the window.

D The tendril of a vine twists round a support.

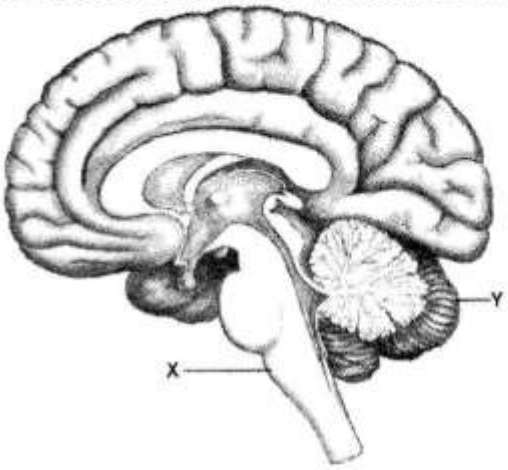
22 The diagrams below show two neurones.



What are the functions of these two neurones?

	Neurone X	**Neurone Y**
A	Transmits impulses away from the central nervous system.	Transmits impulses towards the central nervous system
B	Transmits impulses towards the central nervous system.	Transmits impulses away from the central nervous system.
C	Transmits impulses within the central nervous system	Transmits impulses away from the central nervous system
D	Transmits impulses away from the central nervous system	Transmits impulses within the central nervous system

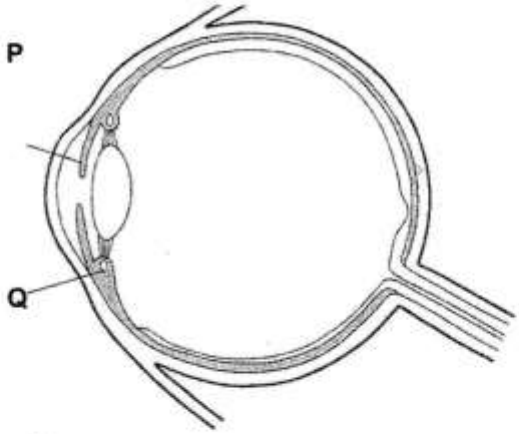
23 **The diagram below shows the human brain seen from the rear side.**



The parts labelled **X** and **Y** are ...

	X	Y
A	Cerebellum	Medulla oblangata
B	Hypothalamus	Cerebellum
C	Medulla Oblangata	Cerebellum
D	Pituitary gland	Hypothalamus

24 The diagram below shows a human eye in section.



What happens to the circular muscles at **P** and **Q** when the eye focuses a near object in dim light?

	P	Q
A	contract	relax
B	contract	contract
C	relax	contract
D	relax	relax

25 The bones of the arms and legs form the ...

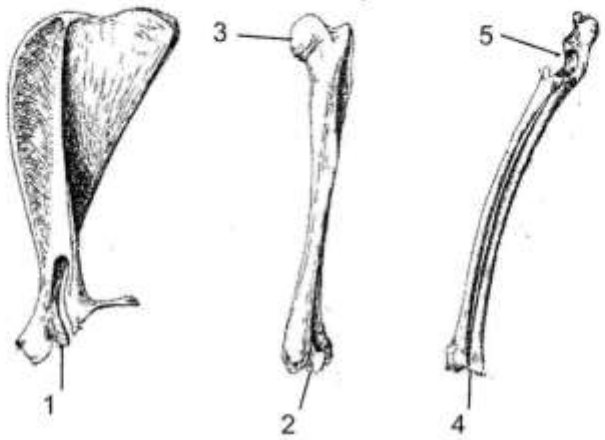
A appendicular skeleton.

B axial skeleton.

C compact bone system.

D spongy bone system.

26 The diagram below shows three bones from the arm of a human being.



Between which labelled parts is the ball and socket joint formed?

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

27 The diagram below shows two stages in weight lifting.


Stage 1


Stage 2

What happens to the structures of the arms in moving from Stage 1 to Stage 2?

	Biceps	Triceps	Elbow Joints
A	Contract	Relax	Move in one place
B	Contract	relax	Rotate
C	Relax	Contract	Move in one place
D	Relax	Contract	Rotate

28 The diagram below shows an underground stem.

What name is given to this underground stem?

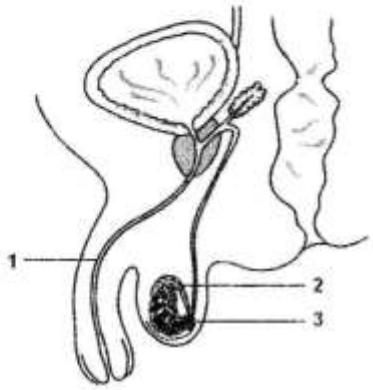
A Corm
B Tuber
C Rhizome
D Runner

29 The diagram below shows a flower of a grass species.

The flower is pollinated by • • •

A birds.
B insects.
C water.
D wind.

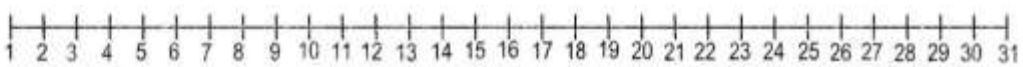
30 The diagram below shows the male reproductive system in humans.



Where are sperms produced and where are they stored?

	Produced	Stored
A	1	2
B	2	3
C	2	4
D	3	4

31 The diagram below represents the menstrual cycle of a human female during the month of July. Menstruation occurred from 4th – 9th July.



Days in the month of July

What was the likely day of ovulation?

A 4th July
B 9th July
C 18th July
D 28th July

32 Which of the following birth control method is hormonal?

A Condom
B Contraceptive Pill
C Intrauterine Device (IUD)
D Tubal ligation

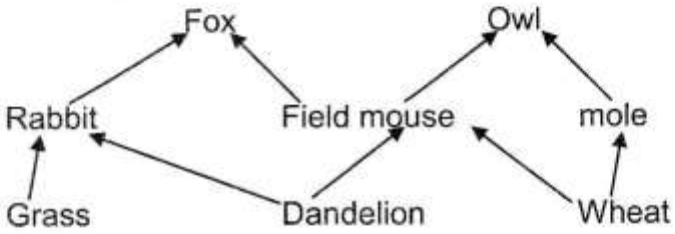
33 Which two diseases are transmitted through contaminated water?

A Malaria / Bilharzia
B Malaria / Tuberculosis
C Cholera / Tuberculosis
D Cholera / Bilharzia

34 What does the human body produce when live vaccines of measles are injected into it?

A Antigens
B Antibodies
C Antibiotics
D Antiseptics

35 The diagram below shows a food web.



Which organisms in the food web are autotrophic?

A Grass, wheat and dandelion
B Field mouse, dandelion and grass
C Rabbit, grass and field mouse
D Wheat, dandelion and field mouse

36 Which of the processes in the nitrogen cycle occurs in water-logged soil?

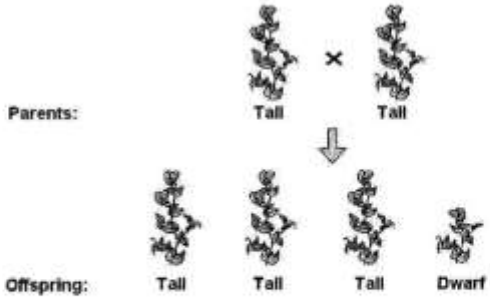
A Ammonification
B Denitrification
C Nitrification
D Nitrogen fixation

37 The table below shows the oxygen level, numbers of plants and of fish in rivers flowing *through four towns.*

Town	Oxygen Level	Plants	Fish
A	High	Few	Many
B	High	Many	Many
C	Low	Few	Few
D	Low	Many	Few

Which town is most likely to be discharging untreated sewage?

38 The diagram below shows a genetic cross between two plants.



Which of the following would be the genotypes of the parent plants?

A TT and TT

B TT and tt

C Tt and Tt

D TT and Tt

39 A pure breeding black male mouse is mated with a brown female mouse and they *produce 12 offspring. If the allele for black fur is dominant to the allele for brown fur,* what would be one possible distribution of fur colour?

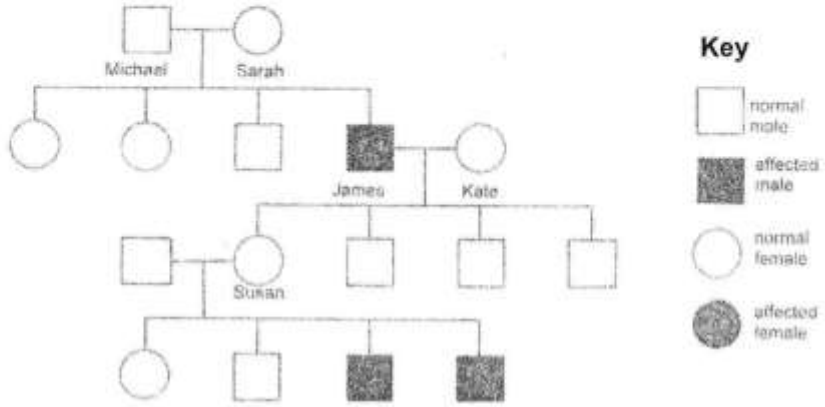
A 6 brown females and 6 black males

B 9 black and 3 brown, all males

C 12 brown all females

D 12 black all males

40 The family pedigree below shows the pattern of inheritance of a genetic disease caused by a sex-linked gene.



What conclusion can be drawn from the diagram?

A Both males and females are carriers

B Only females are carriers

C Only males are carriers

D There are no carriers in the pedigree