

- 1 The following statements are about an organelle of a cell.

- a pair of small cylindrical structures
- form spindle fibers during cell division

What is the organelle?

- A Lysosome
  - B Centrioles
  - C Microtubules
  - D Centromere
- 2 Diagram 1 shows the structure of an animal tissue.

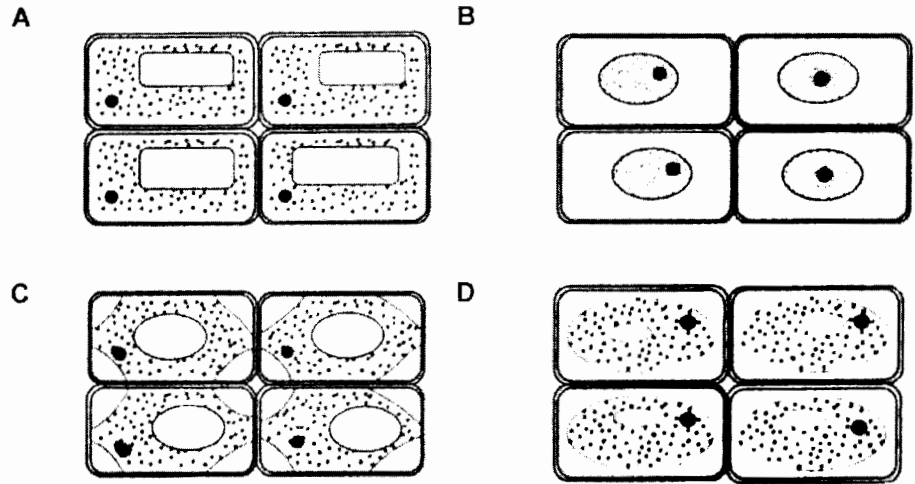


DIAGRAM 1

What is P?

- A Connective tissue
  - B Cardiac muscle
  - C Smooth muscle
  - D Skeletal muscle
- 3 Which type of carbohydrate can be found abundantly in liver cells?
- A Starch
  - B Maltose
  - C Glucose
  - D Glycogen

4 Which of the following potato cells were immersed in a hypotonic solution?



5 Diagram 2 shows the primary structure of a protein.



DIAGRAM 2

Q represents

- A Amino acid
- B Peptide bond
- C Hydrogen bond
- D Polypeptide chain

6 The following reaction represents the breakdown of ozone in the stratosphere

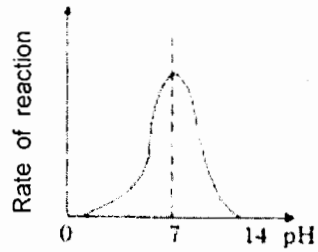


What is represented by R?

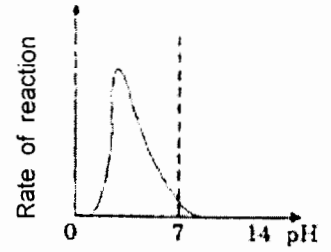
- A Chlorine
- B Fluorine
- C Carbon dioxide
- D Sulphur dioxide

- 7 Which of the following graphs best represents the effect of pH on the rate of reaction of enzymes secreted by the stomach?

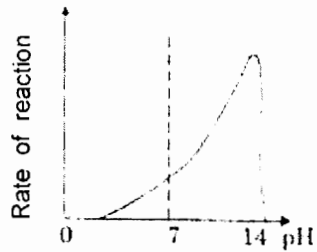
A



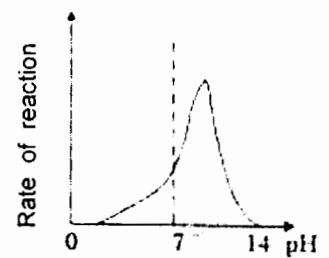
B



C



D



- 8 Diagram 3 shows a stage during meiosis in an animal cell.

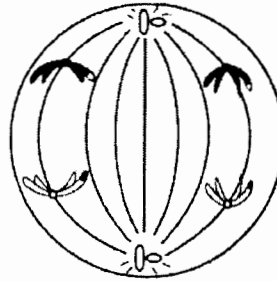


DIAGRAM 3

Which of the statements about the cell is **true**?

- A The cell produces diploid daughter cells
- B The cell is found in the liver
- C The cell has four chromosomes at interphase
- D The cell is at the equator plane

- 9 Diagram 4 shows **1 g** of burning peanut which is placed beneath the boiling tube to heat up 20ml of distilled water.

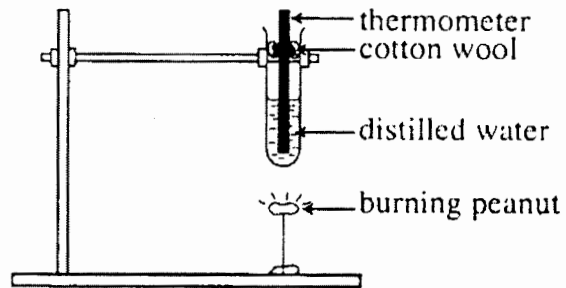


DIAGRAM 4

What is the energy value of the peanut if the initial temperature of the distilled water is  $28^{\circ}\text{C}$  and the final temperature of the distilled water after burning is  $65^{\circ}\text{C}$ . (assuming that 1ml of distilled water weighs 1g)

- A  $6.2 \text{ kJg}^{-1}$   
 B  $3.1 \text{ kJg}^{-1}$   
 C  $7.4 \text{ kJg}^{-1}$   
 D  $0.74 \text{ kJg}^{-1}$
- 10 Diagram 5 shows a circulatory system of an organism.

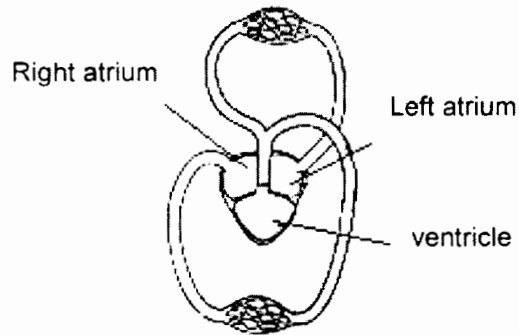


DIAGRAM 5

Which of the following organisms has this type of circulatory system?

- A Man  
 B Frog  
 C Fish  
 D Grasshopper

11 Diagram 6 shows a longitudinal section of a human villus.

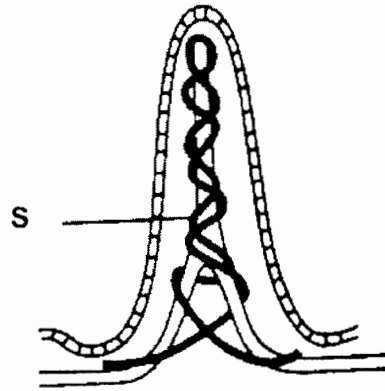


DIAGRAM 6

Which of these compounds can be found in S?

- I Amino acids
- II Vitamin A
- III Iron
- IV Vitamin B

- A IV
- B I, II, IV
- C I, III, IV
- D I, II, III, IV

12 Diagram 7 shows a typical cervical vertebra.

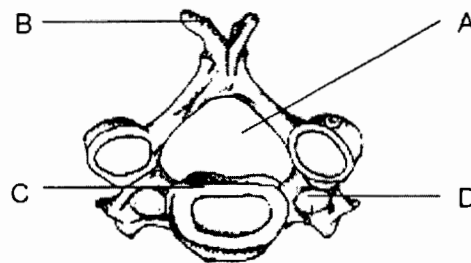


DIAGRAM 7

Which part labelled A, B, C or D allow blood vessels to pass through?

- 13 Diagram 8 shows the structures involved in the inhalation process in the breathing mechanism of a man.

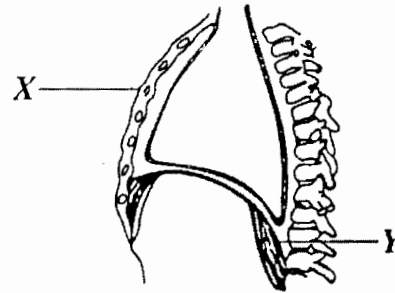


DIAGRAM 8

Which of the following changes that involves the external intercostals muscle (X) and the diaphragm muscle (Y) are correct?

	X	Y
A	Contracts	Contracts
B	Relaxes	Relaxes
C	Contracts	Relaxes
D	Relaxes	Contracts

- 14 Diagram 9 shows the types of roots of species T, U and V in a mangrove swamp.

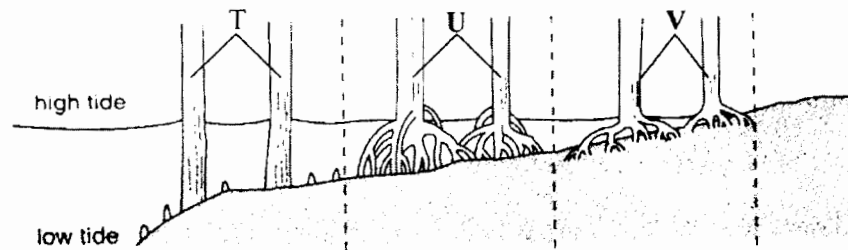


DIAGRAM 9

Which of the following mangrove species represent T, U and V?

	T	U	V
A	<i>Avicennia sp.</i>	<i>Bruguiera sp.</i>	<i>Rhizophora sp.</i>
B	<i>Avicennia sp.</i>	<i>Rhizophora sp.</i>	<i>Bruguiera sp.</i>
C	<i>Rhizophora sp.</i>	<i>Bruguiera sp.</i>	<i>Avicennia sp.</i>
D	<i>Bruguiera sp.</i>	<i>Avicennia sp.</i>	<i>Rhizophora sp.</i>

- 15 Diagram 10 is a graph which shows the number of industrial areas, glass building and agriculture areas in three cities: W, X and Y.

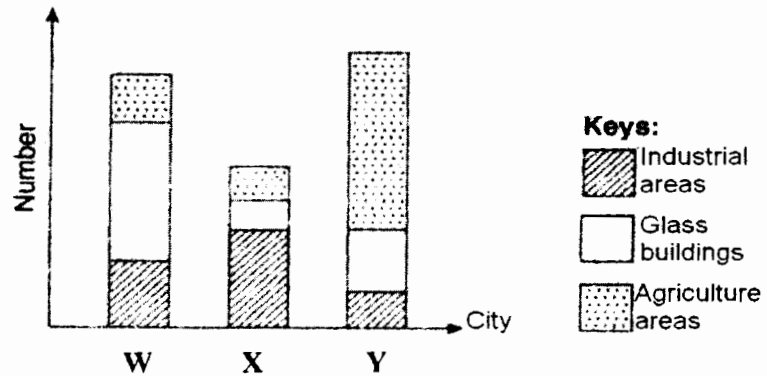


DIAGRAM 10

Which of the following is true of the main pollution in W, X and Y?

	W	X	Y
A	Water	Noise	Air
B	Noise	Thermal	Water
C	Thermal	Air	Water
D	Air	Water	Noise

- 16 Diagram 11 shows the arch of the aorta and carotid arteries in a mammalian heart.

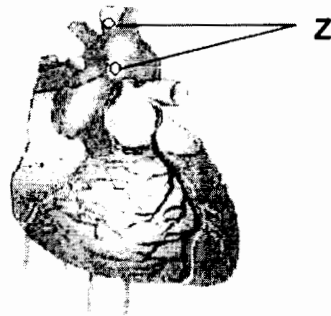


DIAGRAM 11

What is Z?

- A Sinoatrial node
- B Atrioventricular node
- C Baroreceptor
- D Semilunar valve

17 Diagram 12 shows the cross sections of the stem and root of a balsam plant.

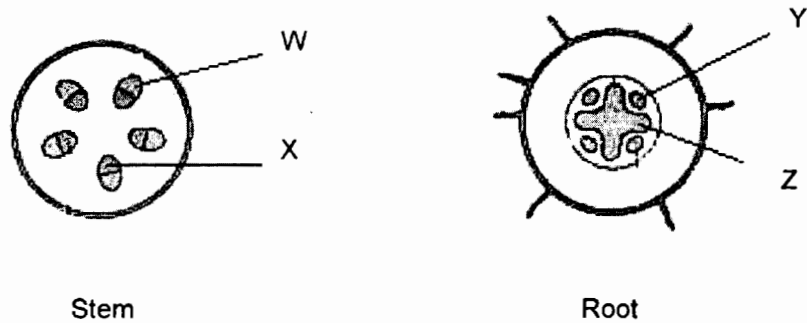


DIAGRAM 12

Which of the following tissues transport water and dissolved mineral salt in the vascular tissue?

- A W and Y
  - B Y and Z
  - C W and X
  - D X and Z
- 18 Which of the following allow fish and grasshopper to move?
- I Have antagonistic muscles
  - II Have a skeleton with joints
  - III Have a fluid-filled cavity
  - IV Have muscles attached to the bones act as a lever
- A I and II.
  - B II and III.
  - C I, II and IV.
  - D I, III and IV.



- 19 Diagram 13 shows a cross section of the spinal cord.

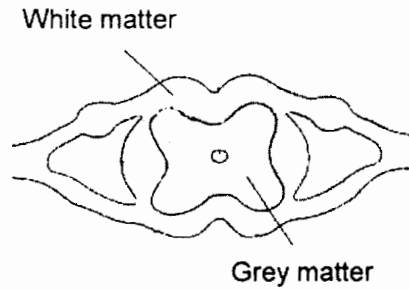


DIAGRAM 13

Where is the cell body of the interneurone and efferent neurone located?

- A dorsal root
  - B ventral root
  - C white matter
  - D grey matter
- 20 Diagram 14 shows ultrafiltration in the Bowman's capsule.

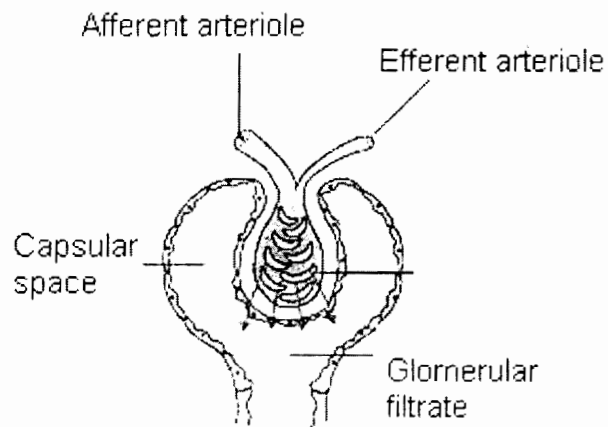


DIAGRAM 14

Which of the following substances enter into the capsular space?

- A water, glucose, amino acids, urea, minerals salts and red blood cell.
- B water, glucose, amino acids, urea and mineral salts.
- C water, glucose, amino acids, urea and plasma proteins.
- D water, glucose, amino acids, glycerol and mineral salts.

21 Diagram 15 shows the changes in the thickness of the endometrium in a menstruation cycle.

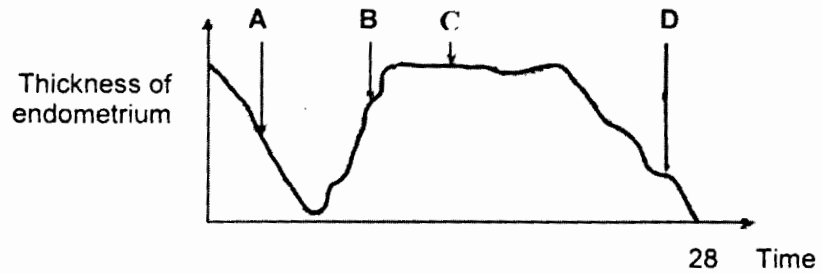


DIAGRAM 15

At which stage will implantation takes place if fertilisation occurs?

22 Diagram 16 shows the structures of a flower.

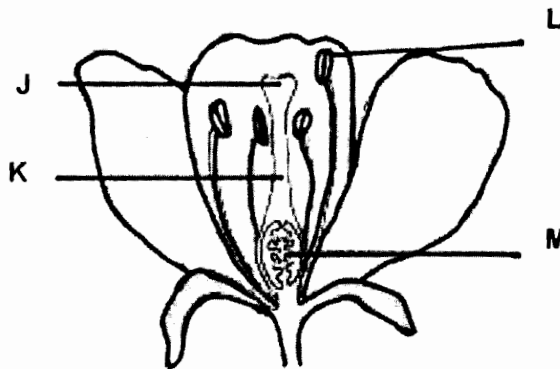


DIAGRAM 16

Where are the male and female gametes produced?

	Male gametes	Female gametes
A	J	K
B	L	M
C	L	J
D	M	L

23 Diagram 17 below shows albinism in the pedigree of a family.

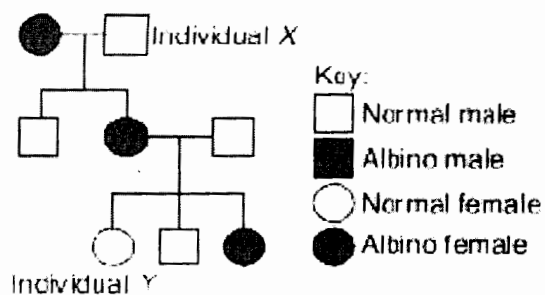


DIAGRAM 17

Albinism is controlled by a recessive allele,  $q$ . What are the genotypes of individuals X and Y?

	Individual X	Individual Y
A	QQ	qq
B	QQ	Qq
C	Qq	qq
D	Qq	Qq

- 24 Which of the following contain similar genotypes?
- A Two seeds from a mangosteen.
  - B Two branches from the same plant.
  - C Two children of the same parents.
  - D Two kittens of the same mother.
- 25 Which of the following is an example of discrete variation in humans?
- A Height
  - B Weight
  - C Skin colour
  - D Blood groups

- 26 Diagram 18 shows a unicellular organism.

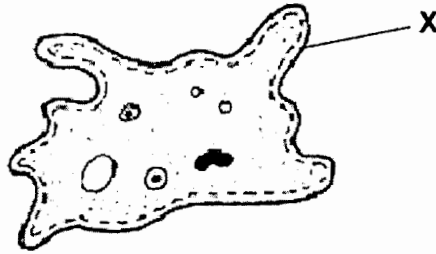


DIAGRAM 18

The structure X is involved in which of the following processes?

- A Nutrition and locomotion
  - B Nutrition and excretion
  - C Locomotion and diffusion
  - D Locomotion and osmoregulation
- 27 Diagram 19 shows a non-woody plant.



DIAGRAM 19

Which of the following tissues support this plant?

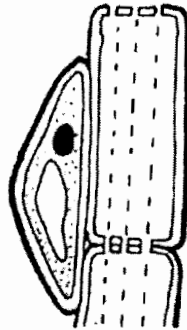
- A parenchyma tissue
- B sclerenchyma tissue
- C aerenchyma tissue
- D meristematic tissue

- 28 Mango slices are immersed in 15% salt solution. After 5 hours, the slices are found to be flaccid and wilted.

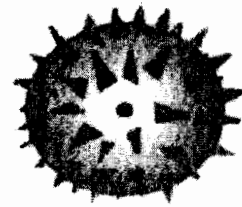
Which of the following statements explains this phenomenon?

- A The low concentration of the cell sap in the vacuole causes water to diffuse out
  - B The mango cell wall allows the salt molecules to diffuse into the cell
  - C The cell sap is hypertonic towards the salt solution
  - D The mango cell membrane allows the water molecules to diffuse into the cell sap due to different concentration gradient
- 29 The diagram shows several plant cells.  
Which of the following cells is the product of a meiosis cell division?

A



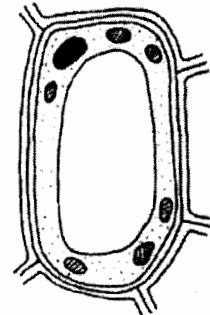
B



C



D



- 30 Diagram 20 shows the structure of the tracheal system in the cockroach.

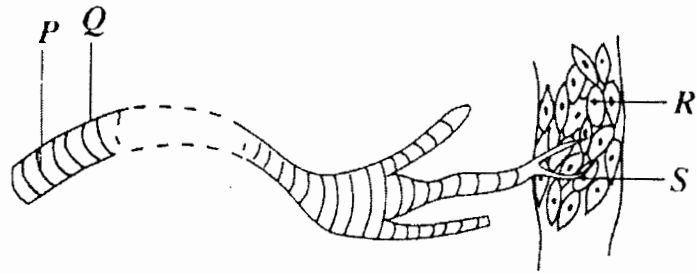


DIAGRAM 20

The following is an explanation about each of the labelled parts.

P - Opening controlled by the cuticle

Q - Presence of chitin thickening on the trachea prevents it from collapsing

R - Gaseous exchange occurs by diffusion

S - Gas dissolve in a thin film of fluid in the tracheole

Which of the above explanation is not true about the labelled parts?

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

- 31 Diagram 21 shows the parts of human digestive system.

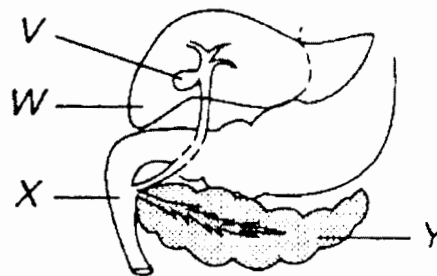


DIAGRAM 21

Which labelled parts secrete juices for fat digestion?

- A V and Y
- B W and Y
- C X and V
- D X and Y

32 Diagram 22 shows oxygen release and intake of a plant in 24 hours.

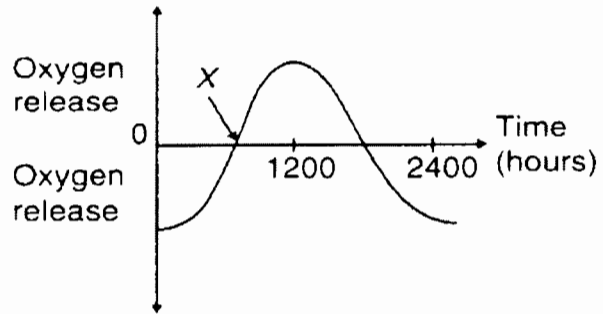


DIAGRAM 22

Which is true about X?

- A Respiration starts
- B Photosynthesis stops
- C Both respiration and photosynthesis do not occur
- D Photosynthesis and respiration rate is equal

33 Diagram 23 shows locomotion in an earthworm.

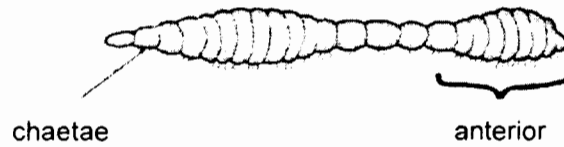


DIAGRAM 23

What will happen to the circular muscles and longitudinal muscles when the earthworm segment becomes shorter and thicker in a forward movement?

	Circular muscle	Longitudinal muscle
A	Relax	Contract
B	Contract	Contract
C	Relax	Relax
D	Contract	Relax

- 34 Diagram 24 shows the cross section of an alveolus and the surrounding blood capillary.

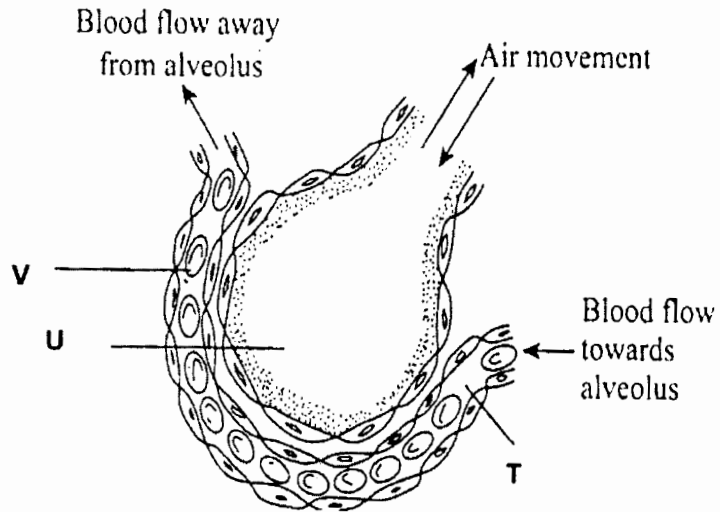


DIAGRAM 24

What is the concentration of oxygen at T, U and V?

	T	U	V
A	Low	High	Low
B	Low	High	High
C	High	Low	Low
D	High	Low	High

- 35 What is the function of neurotransmitter in the nervous system?
- A speed up the transmission of the nerve impulses
  - B receive information from other neurones
  - C transmit impulses from the cell body of the neurone
  - D facilitating the transmission of nerve impulses in one direction



- 36 Which of the following hormones stimulates ovulation?
- A Oestrogen
  - B Follicle-stimulating hormone
  - C Progesterone
  - D Luteinising hormone
- 37 Diagrams 25 shows the growth curve of an organism.

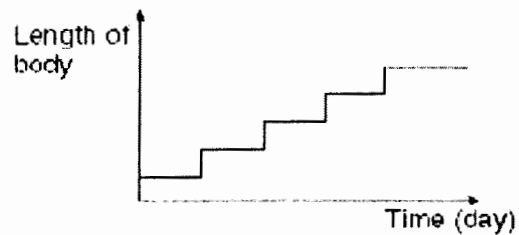


DIAGRAM 25

Which organism has such the growth curve?

- A Rat
  - B Earthworm
  - C Maize
  - D Beetle
- 38 Diagram 26 shows a change in the chromosome structure caused by mutation.

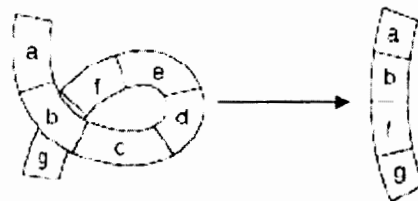


DIAGRAM 26

This type of mutation is called

- A deletion
- B duplication
- C inversion
- D translocation

39 If a woman who is Rhesus negative marries a man who is heterozygous for Rhesus factor, what is the probability that their child will be Rhesus positive?

- A 0
- B 0.25
- C 0.5
- D 0.75

40 Diagram 27 shows the karyotype of an individual.

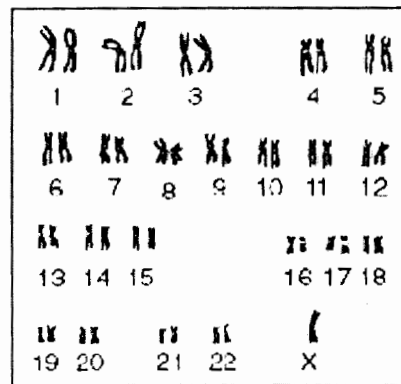


DIAGRAM 27

The individual is a

- A male with Klinefelter's syndrome
  - B female with Klinefelter's syndrome
  - C male with Turner's syndrome
  - D female with Turner's syndrome
- 41 In an experiment to estimate the population of snails in a habitat, the number of snails caught and marked is 120. The snails were then released. After three days, another snails were caught and it was found that 40 of them were marked. What is the estimated population of the snails in the habitat?
- A 200
  - B 300
  - C 600
  - D 1200

42 Table 1 shows changes in a cell during mitosis.

Stage \ Structure in cell	P	Q	R	S
Cytoplasm	Does not divide	Divides	Does not divide	Does not divide
Chromosome	Move towards Cell poles	At cell poles	Randomly distributed in cell	At the equator of cell
Nucleus membrane	Nil	Present	Nil	Nil
Spindle fibre	Present	Nil	Present	Present

TABLE 1

What are P, Q, R and S?

	P	Q	R	S
A	Metaphase	Prophase	Telophase	Anaphase
B	Telophase	Metaphase	Anaphase	Prophase
C	Prophase	Anaphase	Metaphase	Telophase
D	Anaphase	Telophase	Prophase	Metaphase

43 Table 2 shows the average volume of solutions W, X, Y and Z needed to decolourise 1 ml of DCPIP solution.

Solution	Volume of solution to decolourise 1 ml of DCPIP (ml)
W	4.7
X	2.3
Y	3.8
Z	6.5

TABLE 2

Which of the solution contains the highest ascorbic acid content?

- A W
- B X
- C Y
- D Z

- 44 Diagram 28 shows a set up of apparatus to investigate the movement of food substances across the visking tubing containing the mixture of starch and glucose solution.

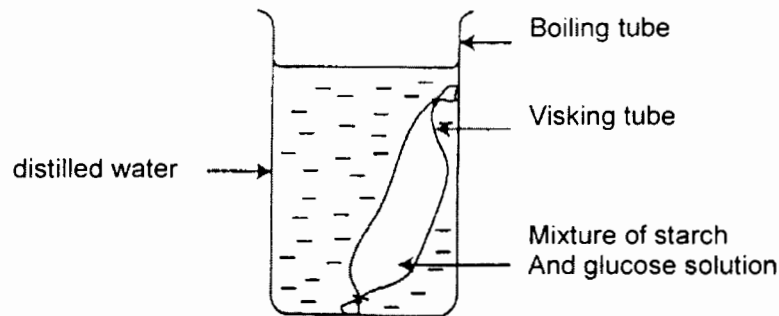


DIAGRAM 28

After 30 minutes, two samples of distilled water were removed for iodine test and Benedict's test. Which of the following are the expected result?

	Iodine test	Benedict's test
A	Blue black	Blue solution
B	Brownish-yellow	Blue solution
C	Blue black	Brick-red percipitate
D	Brownish-yellow	Brick-red percipitate

- 45 The following statement shows the effects of hormone **S** when somebody is angry.

- heart rate increased
- pupils of eyes dilated
- blood pressure increased

What is **S**?

- A Glucagon  
 B Insulin  
 C Growth hormone  
 D Adrenaline

46 Diagram 29 shows a cross section of the blood vessel of a man.

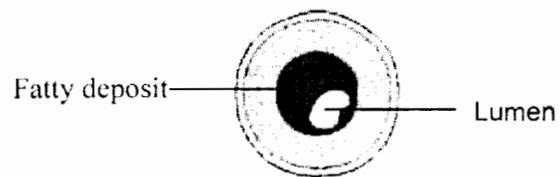


DIAGRAM 29

Which of the following is **true** about the effect of the above disease?

- A he does a lot of exercise
- B he has high blood pressure
- C the lumen becomes more elastic
- D his blood vessel becomes swollen

47 Diagram 30 shows a cross section of the stem in a plant.

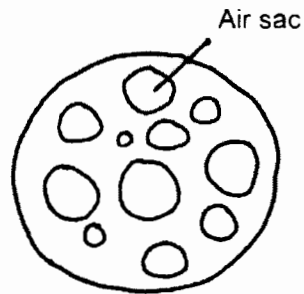


DIAGRAM 30

Which of the following plant is represented in diagram 30?

A



B



C



D



48 Diagram 31 shows the structure of a nephron in the human body.

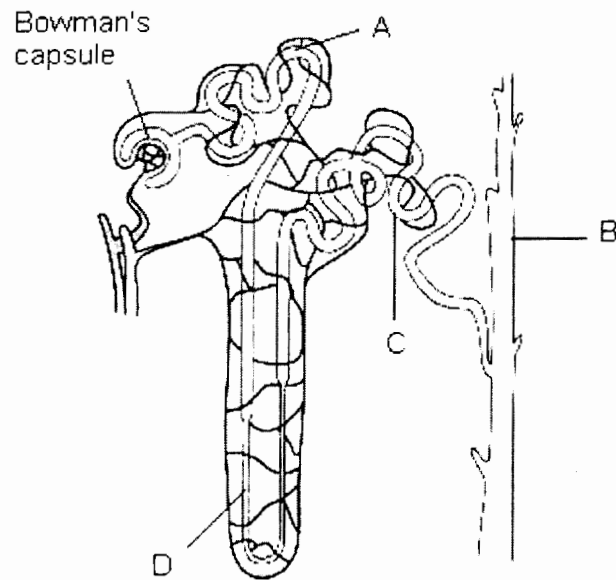


DIAGRAM 31

An athlete drinks 100 plus for his supply of energy and to prevent his body from dehydration. Which labelled part A, B, C and D reabsorbs water and glucose?

- 49 Diagram 32 (a) shows the three zones P, Q and R found in a root tip.  
Diagram 32 (b) shows three cells J, K and L found in the same root tip.

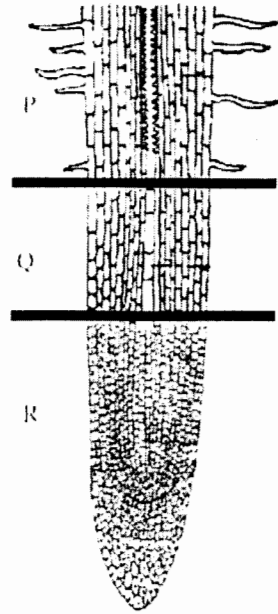


DIAGRAM 32 (a)

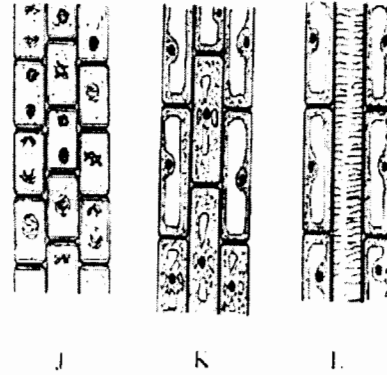


DIAGRAM 32 (b)

Which of the cells J, K and L are found in zones P, Q and R?

	Zone P	Zone Q	Zone R
A	Cell J	Cell L	Cell K
B	Cell K	Cell J	Cell L
C	Cell L	Cell K	Cell J
D	Cell L	Cell J	Cell K

- 50 People who are not able to taste phenylthiocarbamide (PTC) (tasters) have the recessive allele, *t*. Diagram 33 shows the pedigree chart transmission of the gene for tasting PTC in a family.

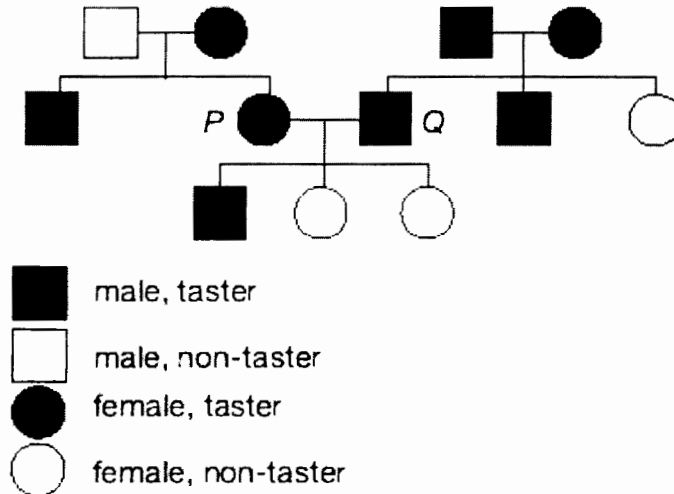


DIAGRAM 33

What are the genotypes of the individuals *P* and *Q*?

	P	Q
A	TT	TT
B	TT	Tt
C	Tt	TT
D	Tt	Tt

END OF QUESTION PAPER