

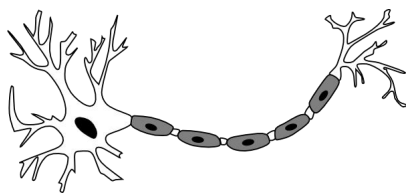
- 1 The following information refers to organelle P.
Maklumat berikut merujuk kepada organel P.

- Contains hydrolytic enzymes
Mengandungi enzim hidrolitik
- Eliminates worn out mitochondrion
Memusnahkan mitokondrion yang sudah lesu

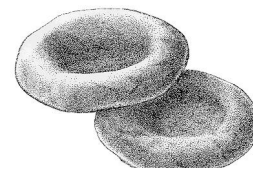
What is organelle P?
Apakah organel P?

- | | |
|---|--|
| <p>A Vacuole
<i>Vakuol</i></p> <p>B Lysosome
<i>Lisosom</i></p> | <p>C Golgi apparatus
<i>Jasad Golgi</i></p> <p>D Rough endoplasmic reticulum
<i>Jalinan endoplasma kasar</i></p> |
|---|--|

- 2 Diagram 1 shows two types of cells, M and N.
Rajah 1 menunjukkan dua jenis sel, M dan N.



Cell M
Sel M



Cell N
Sel N

Diagram 1 / Rajah 1

Which of the following system is correctly matched?
Antara berikut, sistem yang manakah padanan yang betul?

	Cell M <i>Sel M</i>	Cell N <i>Sel N</i>
A	Blood circulatory system <i>Sistem peredaran darah</i>	Muscular system <i>Sistem otot</i>
B	Blood circulatory system <i>Sistem peredaran darah</i>	Nervous system <i>Sistem saraf</i>
C	Nervous system <i>Sistem saraf</i>	Muscular system <i>Sistem otot</i>
D	Nervous system <i>Sistem saraf</i>	Blood circulatory system <i>Sistem peredaran darah</i>

- 3 Diagram 2 shows the phospholipid bilayer which forms the plasma membrane.
Rajah 2 menunjukkan dwilapisan fosfolipid yang membentuk membran plasma.

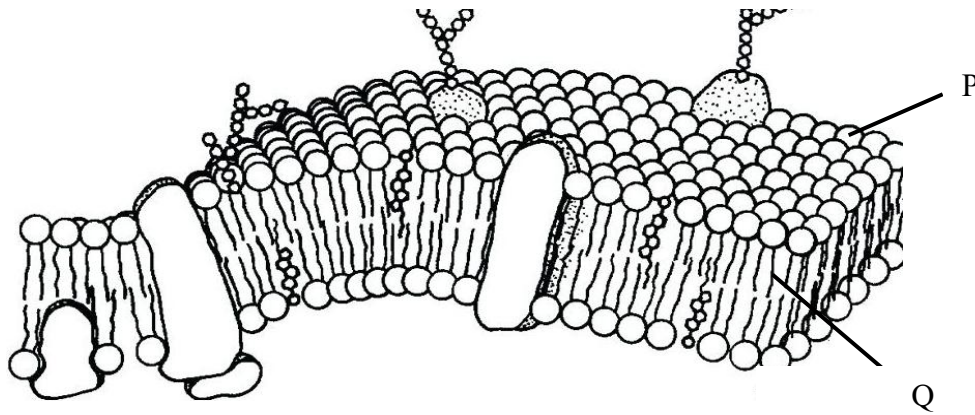


Diagram 2 / *Rajah 2*

What are the parts labelled P and Q?

Apakah bahagian yang berlabel P dan Q?

	P	Q
A	Lipophilic head <i>Kepala lipofilik</i>	Lipophilic tail <i>Ekor lipofilik</i>
B	Lipophobic head <i>Kepala lipofobik</i>	Lipophobic tail <i>Ekor lipofobik</i>
C	Hydrophilic head <i>Kepala hidrofilik</i>	Hydrophobic tail <i>Ekor hidrofobik</i>
D	Hydrophobic head <i>Kepala hidrofobik</i>	Hydrophilic tail <i>Ekor hidrofilik</i>

- 4 Diagram 3 shows the condition of an onion cell.
Rajah 3 menunjukkan keadaan satu sel bawang.

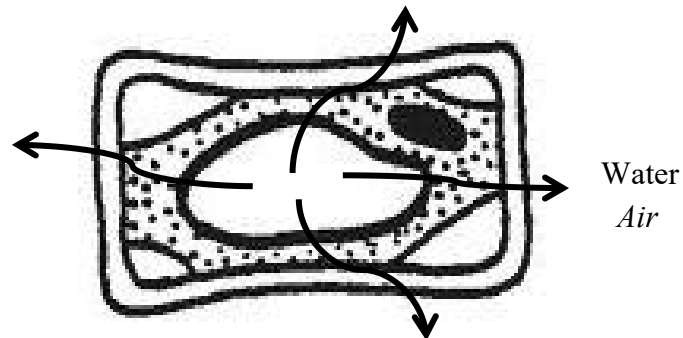


Diagram 3 / *Rajah 3*

Which of the following is true?

Antara berikut, yang manakah benar?

- I** The onion cell undergoes plasmolysis
Sel bawang mengalami plasmolisis
- II** The onion cell has been immersed in a hypertonic solution
Sel bawang ini telah direndam dalam larutan hipertonik
- III** The onion cell has been immersed in a hypotonic solution
Sel bawang ini telah direndam dalam larutan hipotonik
- IV** The onion cell has been immersed in an isotonic solution
Sel bawang ini telah direndam dalam larutan isotonik

- A** I and II
I dan II
- B** I and III
I dan III

- C** II and IV
II dan IV
- D** III and IV
III dan IV

- 5 Diagram 4 shows the movement of water into a root hair cell.
Rajah 4 menunjukkan pergerakan air ke dalam satu sel akar rambut.

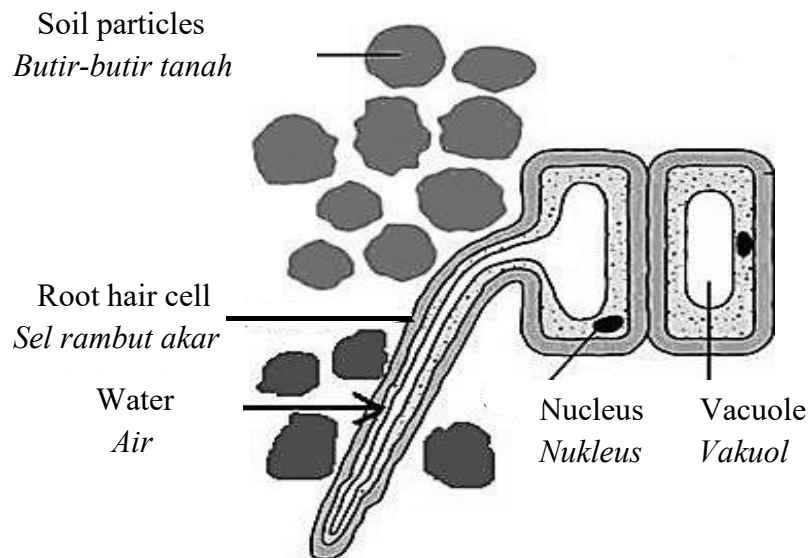


Diagram 4 / Rajah 4

The water is taken by root hair cell through process X.

What is process X?

Air diambil oleh sel rambut akar melalui proses X.

Apakah proses X?

- | | |
|---|---|
| A Osmosis
<i>Osmosis</i> | C Active transport
<i>Pengangkutan aktif</i> |
| B Simple diffusion
<i>Resapan ringkas</i> | D Facilitated diffusion
<i>Resapan berbantu</i> |

- 6 Diagram 5 shows the structure of a DNA nucleotide.
Rajah 5 menunjukkan struktur satu nukleotida DNA.

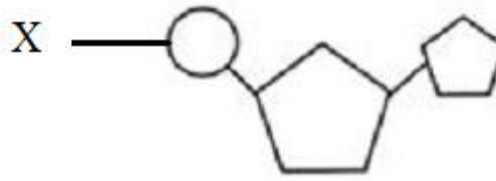


Diagram 5 / *Rajah 5*

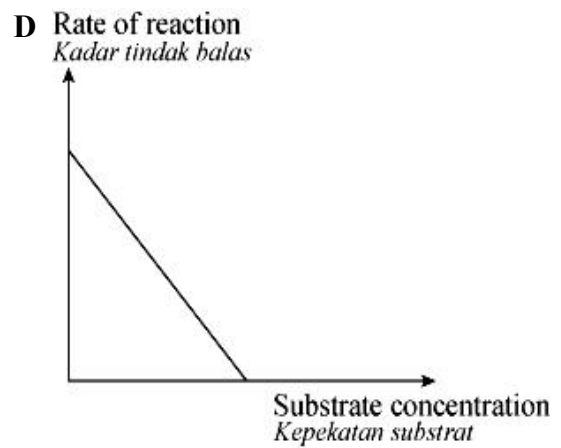
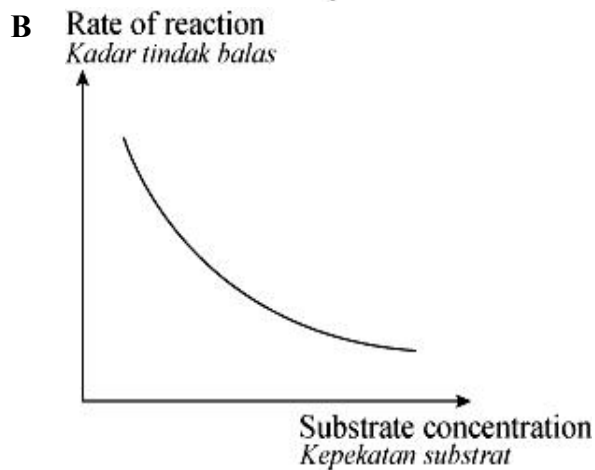
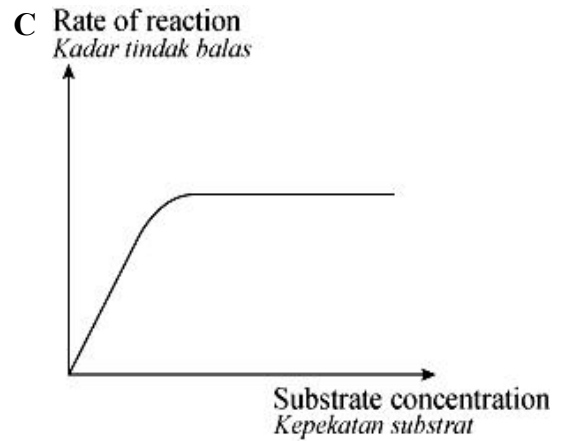
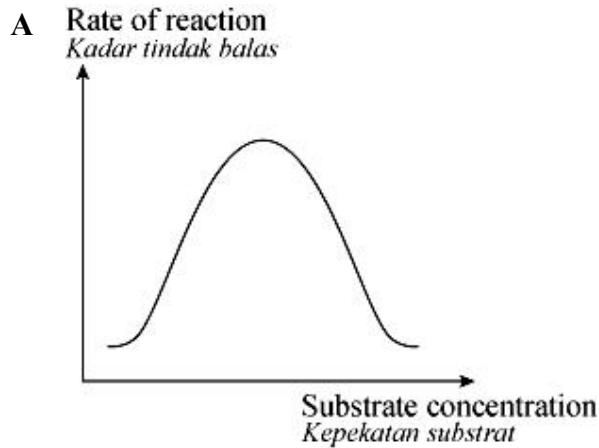
What is X?

Apakah X?

- | | |
|--|--|
| A Sulphate group
<i>Kumpulan sulfat</i> | C Nitrogenous base
<i>Bes bernitrogen</i> |
| B Phosphate group
<i>Kumpulan fosfat</i> | D Deoxyribose sugar
<i>Gula deoksiribosa</i> |
- 7 Which of the following statement is correct about saturated fats?
Antara pernyataan berikut, yang manakah betul mengenai lemak tepu?
- A** Has a low melting point
Mempunyai takat lebur yang rendah
 - B** Liquid at room temperature
Cecair pada suhu bilik
 - C** Contains double bond in fatty acids
Mempunyai ikatan ganda dua dalam asid lemak
 - D** Increases the level of cholesterol in the blood
Meningkatkan aras kolesterol dalam darah

- 8 Which of the following graphs shows the relationship between the rate of enzymatic reaction and the substrate concentration?

Antara graf berikut, yang manakah menunjukkan hubungan antara kadar tindak balas enzim dan kepekatan substrat?



- 9 Diagram 6 shows the structure of a chromosome.

Rajah 6 menunjukkan struktur kromosom.

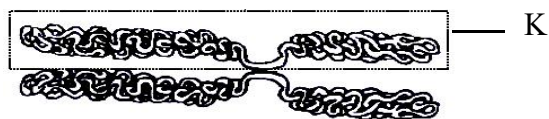


Diagram 6 / *Rajah 6*

What is K?

Apakah K?

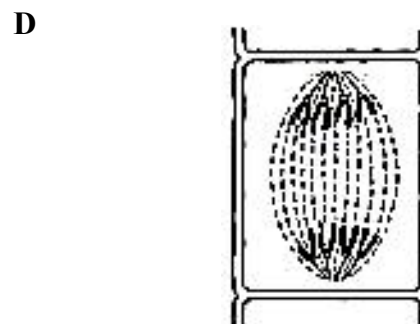
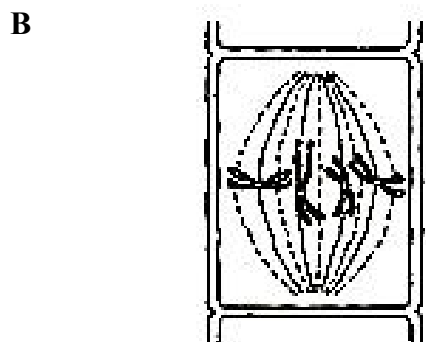
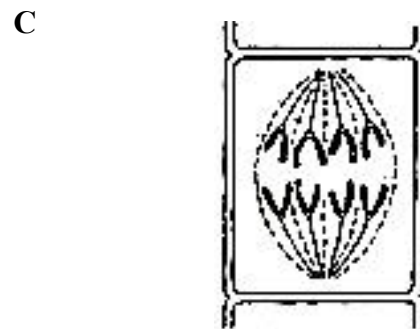
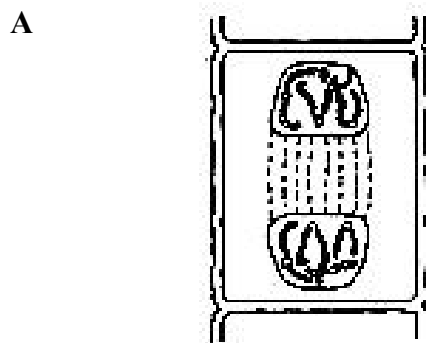
- | | |
|---|---------------------------------------|
| A Centriole
<i>Sentriol</i> | C Chromatid
<i>Kromatid</i> |
| B Centromere
<i>Sentromer</i> | D Chiasma
<i>Kiasma</i> |

- 10 Diagram 7 shows a stage of mitosis in plant.
Rajah 7 menunjukkan satu peringkat mitosis pada tumbuhan.



Diagram 7 / *Rajah 7*

What is the next stage of the mitotic cell division?
Apakah peringkat seterusnya bagi pembahagian sel mitosis ini?



- 11 The statements below show the processes that occur during meiosis.
Pernyataan di bawah menunjukkan proses yang berlaku semasa meiosis.

- Spindle fibres pull the tetrads to the middle of the cell.
Gentian gelendong menarik tetrad ke bahagian tengah sel.
- Chromosomes align at the equator.
Kromosom bersusun pada satah khatulistiwa.
- One chromosome of each homologous pair faces each pole of the cell.
Setiap kromosom dari pasangan homolog berdepan dengan kutub sel.

Which of the following is the stage of cell division as stated above?
Antara berikut, yang manakah adalah peringkat pembahagian sel di atas?

- | | |
|---|---|
| <p>A Metaphase I
<i>Metafasa I</i></p> <p>B Prophase I
<i>Profasa I</i></p> | <p>C Anaphase I
<i>Anafasa I</i></p> <p>D Prophase II
<i>Profasa II</i></p> |
|---|---|
- 12 Diagram 8 shows a meiotic cell division in an animal cell.
Rajah 8 menunjukkan pembahagian sel secara meiosis dalam satu sel haiwan.

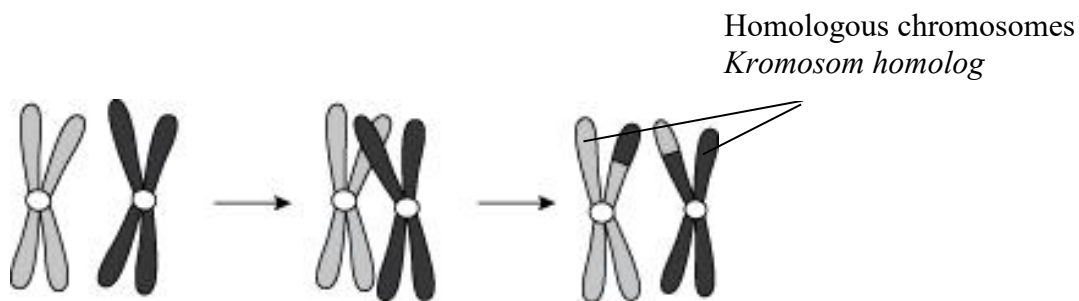


Diagram 8 / Rajah 8

What is the process that occurs during the stage shown above?
Apakah proses yang berlaku dalam peringkat yang ditunjukkan di atas?

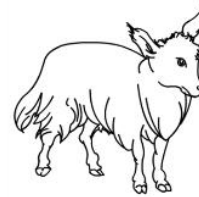
- | | |
|--|---|
| <p>A Synapsis of sister chromatids
<i>Sinapsis antara kromatid beradik</i></p> <p>B Formation of centromere
<i>Pembentukan sentromer</i></p> | <p>C Crossing over
<i>Pindah silang</i></p> <p>D Independent assortment
<i>Gabungan bebas</i></p> |
|--|---|

- 13 Which of the following organisms carries out autotrophic nutrition?
Antara organisma berikut, yang manakah menjalankan nutrisi autotrof?

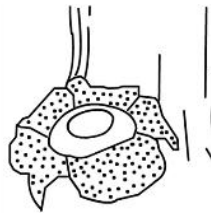
A



C



B



D



- 14 Table 1 shows the observations of three different food tests carried out on a food sample.
Jadual 1 menunjukkan pemerhatian bagi tiga ujian makanan yang berlainan dijalankan ke atas satu sampel makanan.

Test <i>Ujian</i>	Observation <i>Pemerhatian</i>
Biuret test <i>Ujian Biuret</i>	No change <i>Tiada perubahan</i>
Benedict's test <i>Ujian Benedict</i>	Brick red precipitate is formed <i>Mendakan merah bata terbentuk</i>
Iodine test <i>Ujian Iodin</i>	Iodine solution turns dark blue <i>Larutan iodin menjadi biru tua</i>

Table 1 / *Jadual 1*

- Which of the following is the food sample?
Antara berikut, yang manakah sampel makanan itu?

A Fried fish

Ikan goreng

C Milk

Susu

B Meat ball

Bebola daging

D Biscuit

Biskut

- 15 Diagram 9 shows the digestive system of rabbit.
Rajah 9 menunjukkan sistem pencernaan bagi arnab.

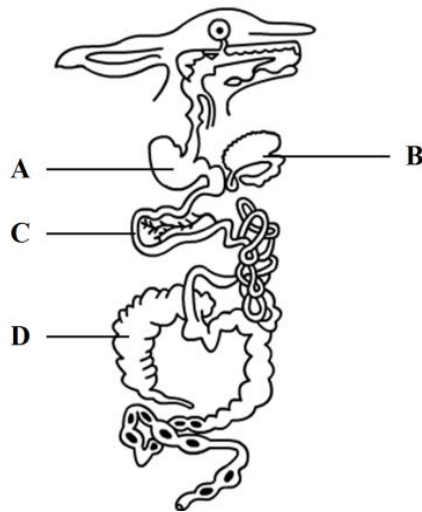


Diagram 9 / *Rajah 9*

Which part labelled **A**, **B**, **C** or **D**, is the caecum?
*Antara bahagian berlabel **A**, **B**, **C** dan **D**, yang manakah merupakan sekum?*

- 16 Diagram 10 shows the structure of a chloroplast.
Rajah 10 menunjukkan struktur kloroplas.

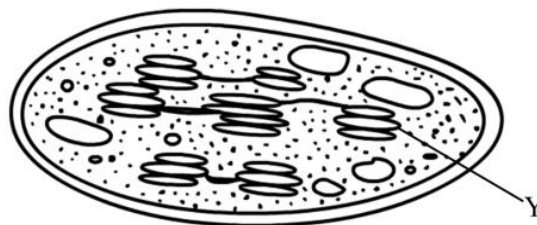


Diagram 10 / *Rajah 10*

What process occurs in Y?
Apakah proses yang berlaku di Y?

- A** The dissociation of water molecule by sunlight
Penguraian air oleh cahaya matahari
- B** The reduction of carbon dioxide by hydrogen
Penurunan karbon dioksida oleh hidrogen
- C** The production of glucose
Penghasilan glukosa
- D** The production of starch
Penghasilan kanji

- 17 Diagram 11 is a graph showing the volume of carbon dioxide taken in or released by a plant at different light intensity.

Rajah 11 ialah satu graf yang menunjukkan isi padu karbon dioksida yang diambil atau dibebaskan oleh tumbuhan mengikut keamatan cahaya yang berbeza.

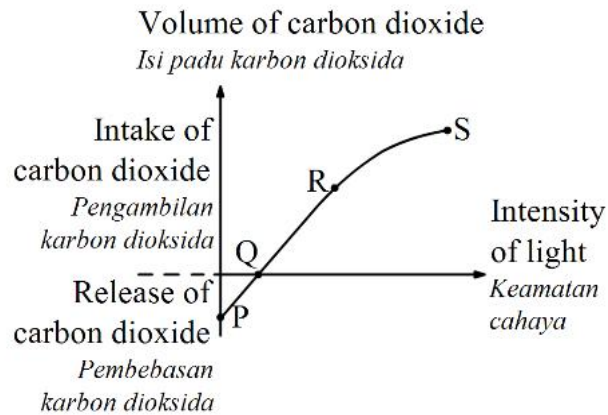


Diagram 11 / Rajah 11

Which of the following statements is true?

Antara pernyataan berikut, yang manakah benar?

- A The volume of carbon dioxide released is zero at point P
Isi padu pembebasan karbon dioksida adalah sifar pada titik P
- B The volume of carbon dioxide released is maximum at point R
Isi padu pembebasan karbon dioksida adalah maksima pada titik R
- C The volume of the intake and the release of carbon dioxide are equal at point S
Isi padu pengambilan karbon dioksida sama dengan kuantiti pembebasannya pada titik S
- D The volume of the intake and the release of carbon dioxide are equal at point Q
Isi padu pengambilan karbon dioksida sama dengan kuantiti pembebasannya pada titik Q
- 18 The following statements are about a method in food processing.
Pernyataan berikut adalah mengenai kaedah dalam pemprosesan makanan.

- The food is heated to 72°C for 15 seconds
Makanan dipanaskan hingga 72°C selama 15 saat
- Then it is cooled to 10°C
Kemudian ia disejukkan ke 10°C

What is the method used?

Apakah kaedah yang digunakan?

- | | |
|---|------------------------------------|
| A Pasteurisation
<i>Pempasteuran</i> | C Fermentation
<i>Penapaian</i> |
| B Refrigeration
<i>Penyejukan</i> | D Freezing
<i>Pembekuan</i> |

- 19 Which of the following is the correct equation for the respiration in muscle cells?
 Antara berikut yang manakah merupakan persamaan yang betul bagi respirasi di dalam sel otot?

- A Glucose \longrightarrow Lactic Acid + Energy
 Glukosa \longrightarrow Asid Laktik + Tenaga
- B Glucose \longrightarrow Carbon Dioxide + Lactic Acid + Energy
 Glukosa \longrightarrow Karbon Dioksida + Asid Laktik + Tenaga
- C Glucose + Oxygen \longrightarrow Carbon Dioxide + Water + Energy
 Glukosa + Oksigen \longrightarrow Karbon Dioksida + Air + Tenaga
- D Glucose + Oxygen \longrightarrow Carbon Dioxide + Ethanol + Energy
 Glukosa + Oksigen \longrightarrow Karbon Dioksida + Etanol + Tenaga

- 20 Diagram 12 shows a respiratory system of an insect.
 Rajah 12 menunjukkan sistem respirasi seekor serangga.

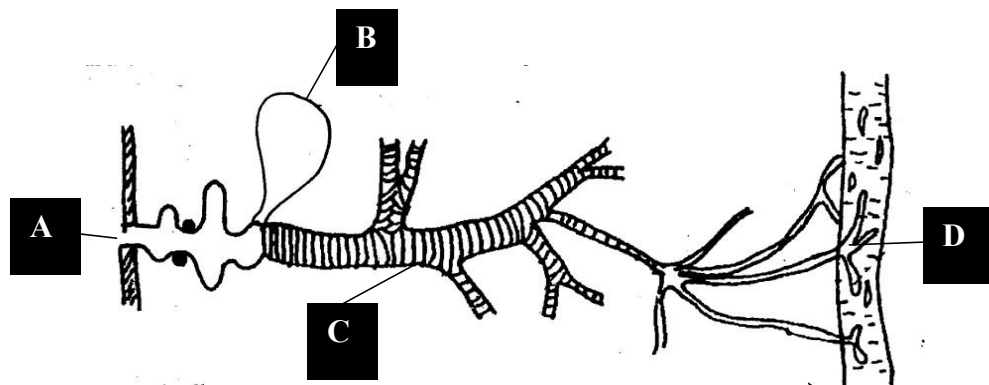


Diagram 12 / Rajah 12

- Which part labelled A, B, C or D does exchange of gases occur?
 Antara bahagian berlabel A, B, C dan D di manakah berlakunya pertukaran gas?

- 21 Diagram 13 shows the longitudinal section of an alveolus and a blood capillary.
Rajah 13 di bawah menunjukkan keratan memanjang alveolus dan kapilari darah.

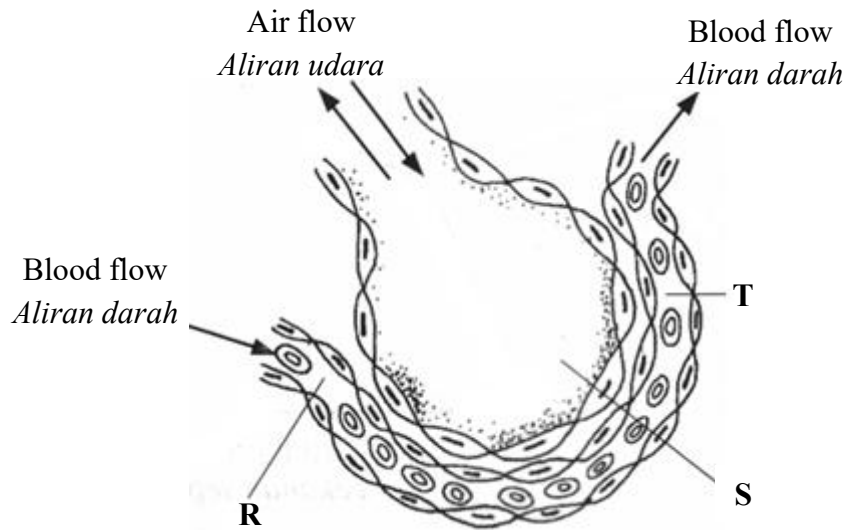


Diagram 13 / Rajah 13

What are the partial pressure of oxygen at R, S and T?
Apakah tekanan separa oksigen di R, S dan T?

	R	S	T
A	High <i>Tinggi</i>	Low <i>Rendah</i>	High <i>Tinggi</i>
B	Low <i>Rendah</i>	High <i>Tinggi</i>	Low <i>Rendah</i>
C	High <i>Tinggi</i>	Low <i>Rendah</i>	Low <i>Rendah</i>
D	Low <i>Rendah</i>	High <i>Tinggi</i>	High <i>Tinggi</i>

- 22 Which of the following is the similarity between both photosynthesis and respiration?
Antara berikut, yang manakah persamaan bagi kedua-dua fotosintesis dan respirasi?

- A Both produce energy
Kedua-duanya menghasilkan tenaga
- B Both produce water
Kedua-duanya menghasilkan air
- C Both take place in living cells
Kedua-duanya berlaku dalam sel hidup
- D Both need oxygen
Kedua-duanya memerlukan oksigen

- 23 The oxygen level in the blood of a mountain climber drops from its normal level during mountain climbing.
Which processes occur in his respiratory system to return the oxygen level to normal?
Aras oksigen dalam darah seorang pendaki gunung jatuh di bawah aras normal semasa mendaki gunung.
Proses manakah yang berlaku dalam sistem pernafasannya untuk mengembalikan aras oksigen ke normal?

- I pH of blood decreases
pH darah menurun
- II Breathing and ventilation rates increases
Kadar pernafasan dan ventilasi meningkat
- III Intercostal muscles contract and relax slower
Otot interkosta mengecut dan mengendur dengan lebih lambat
- IV Respiratory muscles contract and relax faster
Otot respirasi mengecut dan mengendur dengan lebih cepat
- A I and II
I dan II
- B I and III
I dan III
- C II and IV
II dan IV
- D III and IV
III dan IV

- 24 Diagram 14 shows the structure of a leaf.
Rajah 14 menunjukkan struktur sehelai daun.

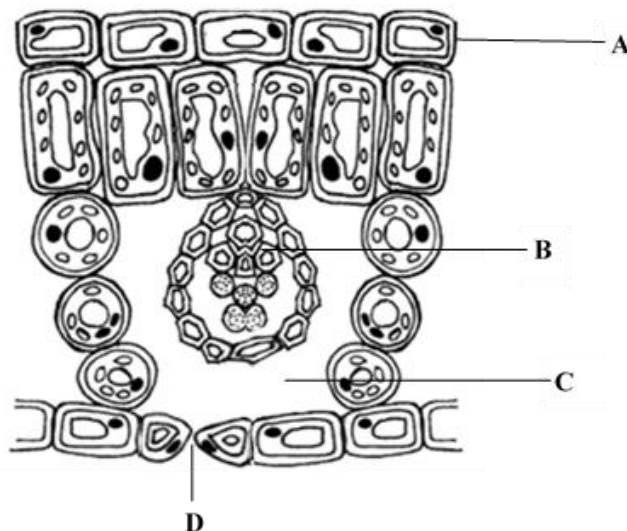


Diagram 14 / Rajah 14

- Which part labelled **A**, **B**, **C** or **D** allows the diffusion of gaseous into and out of the leaf?
*Antara bahagian berlabel **A**, **B**, **C** dan **D** yang manakah membenarkan gas meresap masuk dan keluar dari daun ?*

- 25 Diagram 15 shows an interaction between two organisms.
Rajah 15 menunjukkan satu interaksi antara dua organisma.

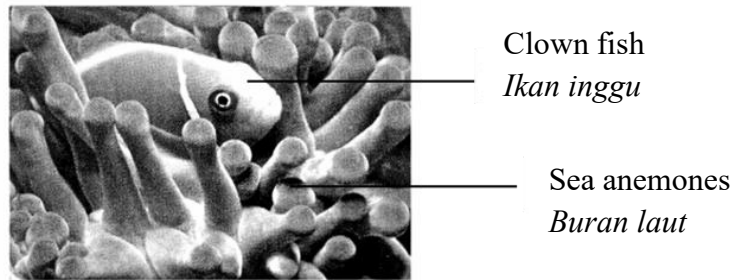


Diagram 15 / Rajah 15

What is the type of interaction shown?
Apakah jenis interaksi yang ditunjukkan?

- | | |
|--|--|
| A Commensalism
<i>Komensalisme</i> | C Saprophytism
<i>Saprofitisme</i> |
| B Prey-predator
<i>Mangsa - pemangsa</i> | D Parasitism
<i>Parasitisme</i> |
- 26 The following information describes process X which occurs in an ecosystem.
Maklumat berikut menerangkan proses X yang berlaku dalam suatu ekosistem.

- The pioneer species is replaced by a new species which is more adapted to the habitat
Spesies perintis diganti oleh spesies baru yang lebih sesuai dengan habitat
- The process occurs gradually over a long period of time
Proses berlaku beransur-ansur pada jangka masa yang panjang
- The process ends with a climax community
Proses berakhir dengan komuniti klimaks

What is process X?
Apakah proses X?

- A** Colonisation
Pengkolonian
- B** Competition
Persaingan
- C** Succession
Sesaran
- D** Evolution
Evolusi

- 27 A student carried out a study on the population of *Mimosa pudica* in the school's field. He used the quadrat sampling technique in the study. The area of each quadrat is 1m^2 .
Seorang pelajar menjalankan kajian populasi Mimosa pudica di padang sekolahnya. Dia menggunakan teknik persampelan kuadrat dalam kajiannya. Luas setiap kuadrat ialah 1m^2 .

Table 2 shows the results of the study.

Jadual 2 menunjukkan keputusan kajian itu.

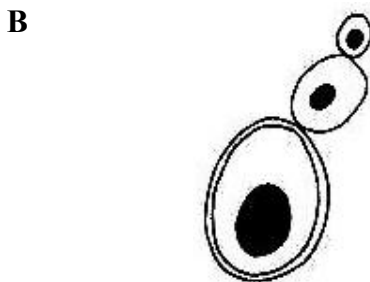
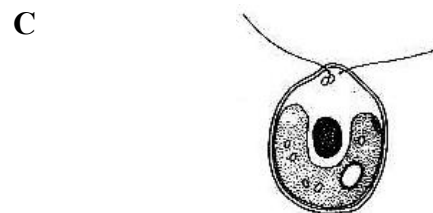
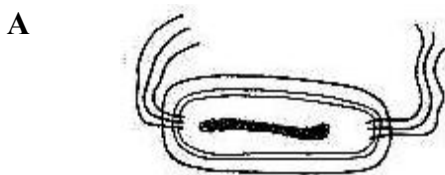
Quadrat Kuadrat	Area covered by <i>Mimosa pudica</i> / m^2 Keluasan litupan <i>Mimosa pudica</i> / m^2
1	0.32
2	0.78
3	0.18
4	0.64
5	0.20
6	0.15

Table 2 / Jadual 2

What is the percentage coverage of *Mimosa pudica* in the school field?

Apakah peratus litupan Mimosa pudica di padang sekolah itu?

- A 22.7%
 B 37.8%
 C 2.27%
 D 3.78%
- 28 Which of the following organisms is classified into kingdom Monera?
Organisma manakah yang dikelaskan dalam alam Monera?



- 29 The following statement is about situation X.
Pernyataan berikut adalah mengenai situasi X.

Nitrates and phosphates from a farmland that flow into a lake caused rapid growth of algae.

Nitrat dan fosfat yang dialirkan dari tanah ladang ke dalam tasik telah menyebabkan pertumbuhan alga yang mendadak.

What is X?
Apakah X?

- A Eutrophication
Eutrofikasi
 - B Pesticide pollution
Pencemaran pestisid
 - C Thermal pollution
Pencemaran terma
 - D Colonisation
Pengkolonian
- 30 Diagram 16 shows an environmental phenomenon.
Rajah 16 menunjukkan suatu fenomena alam sekitar.

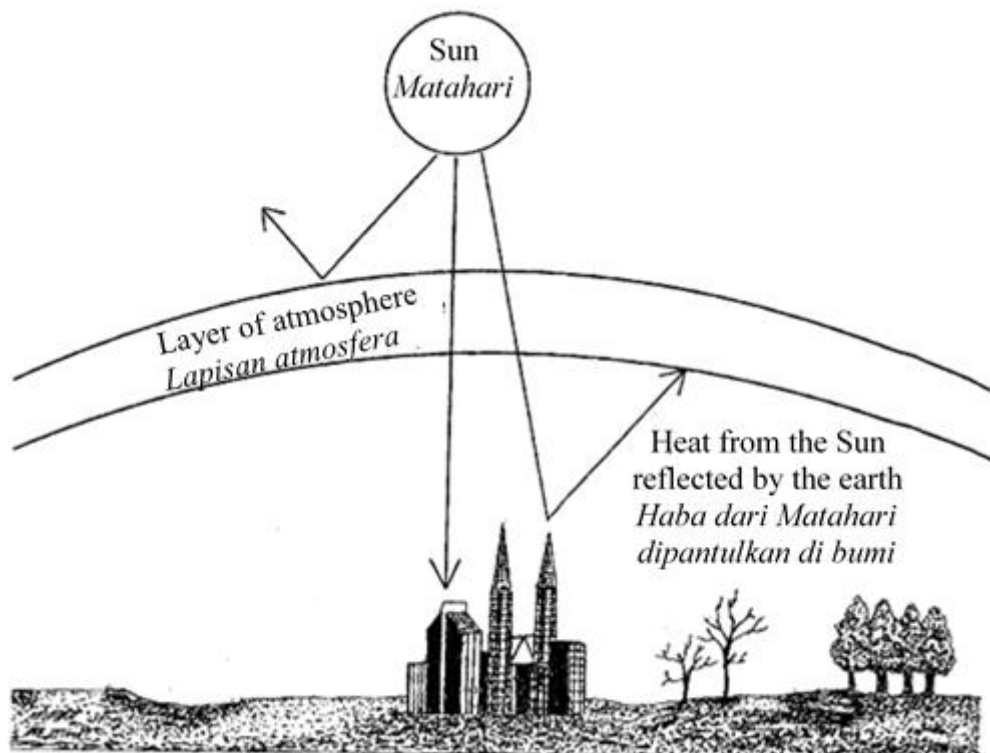


Diagram 16 / Rajah 16

What is the phenomenon?
Apakah fenomena ini?

- A Air pollution
Pencemaran udara
- B Greenhouse effect
Kesan rumah hijau
- C Effect of radiation
Kesan radiasi
- D Thinning of ozone layer
Penipisan lapisan ozon

- 31 Diagram 17 shows part of the lymphatic system in human.
Rajah 17 menunjukkan sebahagian daripada sistem limfa dalam manusia.

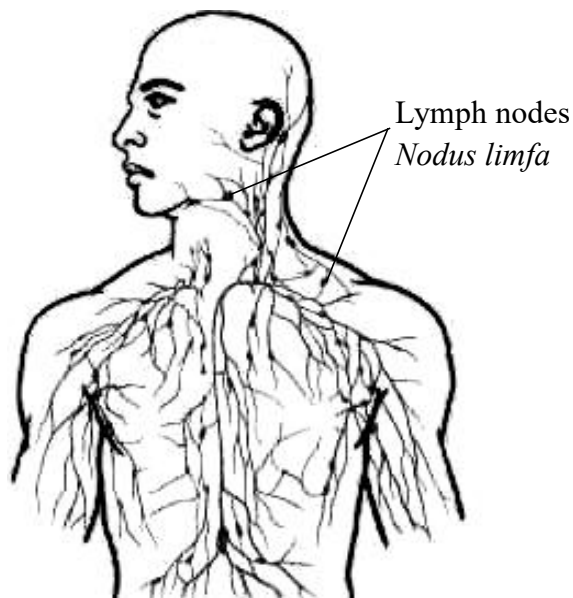


Diagram 17 / Rajah 17

What happens to the lymph node when it is infected by pathogens?
Apa akan berlaku kepada nodus limfa jika ia dijangkiti oleh patogen?

- A It will burst
Ia akan pecah
- B It will swell
Ia akan membengkak
- C It will shrink
Ia akan mengecut
- D The size remains the same
Saiznya tidak berubah

- 32 Diagram 18 shows the human blood vessels.
Rajah 18 menunjukkan salur darah manusia.

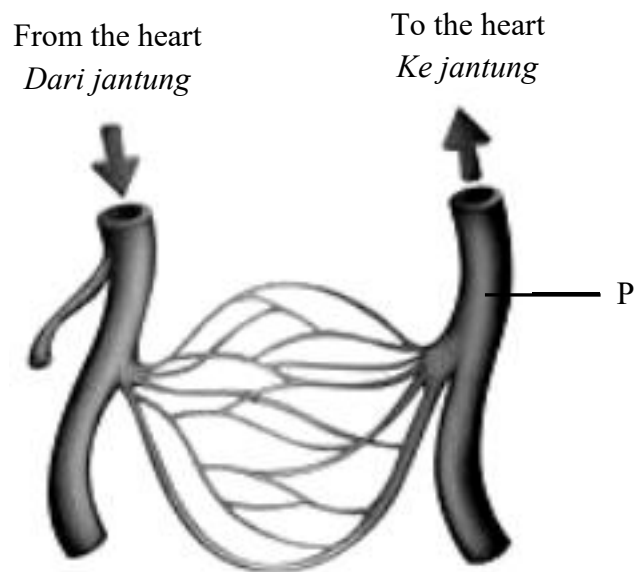


Diagram 18 / *Rajah 18*

Which of the following are the characteristics of P?
Antara yang berikut, yang manakah ciri-ciri P?

- I Muscular and elastic wall
Dinding berotot dan kenyal
 - II Big lumen
Lumen yang besar
 - III Transports oxygenated blood
Mengangkut darah beroksigen
 - IV Have valves
Mempunyai injap
- A I and II
I dan II
 - B I and III
I dan III
 - C II and IV
II dan IV
 - D III and IV
III dan IV

- 33 Diagram 19 shows the cross section of a dicotyledonous stem.
Rajah 19 menunjukkan keratan rentas batang dikotiledon.

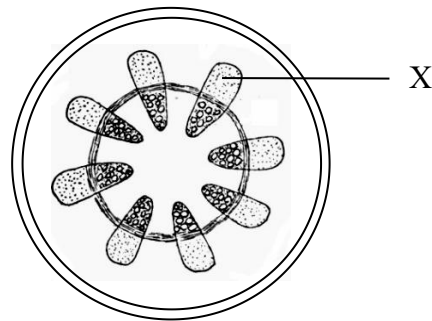


Diagram 19 / *Rajah 19*

Which of the following is correct about X?

Antara yang berikut, yang manakah benar tentang X?

- A** X consists of dead cells.
X terdiri daripada sel-sel mati.
- B** The cell wall of X is impregnated by lignin.
Dinding sel X mempunyai penebalan lignin.
- C** Two main cells in X are sieve tube and companion cell.
Dua jenis sel utama dalam X ialah tiub tapis dan sel rakan.
- D** Two main cells in X are xylem vessel and tracheid.
Dua jenis sel utama dalam X ialah salur xilem dan trakeid.
- 34 Diagram 20 shows the droplets of water at the edges of a plant leaves.
Rajah 20 menunjukkan titisan air di hujung daun suatu tumbuhan.

Droplets of water
Titisan air



Diagram 20 / *Rajah 20*

What is the main factor that causes this phenomenon?

Apakah faktor utama yang menyebabkan fenomena ini?

- | | |
|---|--|
| A Osmosis
<i>Osmosis</i> | C Cohesive force
<i>Daya lekitan</i> |
| B Root pressure
<i>Tekanan akar</i> | D Adhesive force
<i>Daya lekatan</i> |

- 35 The following information describes the characteristics of the skeletal system of animal Q.

Maklumat berikut menerangkan ciri-ciri sistem rangka bagi haiwan Q.

- The skeleton is non-living thus it hinders growth
Rangka tersebut adalah bukan hidup maka ia menghalang pertumbuhan
- The skeleton is made up of chitin
Rangka diperbuat daripada kitin

What is animal Q?

Apakah haiwan Q?

- A Bird
Burung
- B Crab
Ketam
- C Starfish
Tapak sulaiman
- D Caterpillar
Ulat beluncas
- 36 Diagram 21 shows vertebrae P, Q, R and S found along the spine of human.
Rajah 21 menunjukkan vertebra P, Q, R dan S yang terdapat sepanjang tulang belakang manusia.

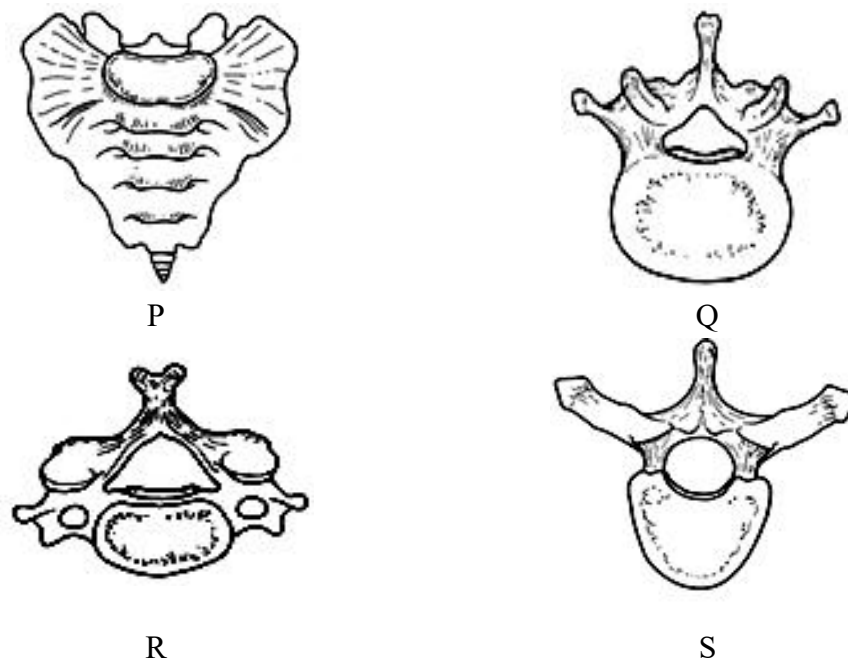


Diagram 21 / *Rajah 21*

Which of the following shows the correct arrangement of vertebrae in the spine?
Antara berikut yang manakah menunjukkan susunan vertebra yang betul pada tulang belakang?

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

- 37 Diagram 22 shows the structure of a fish.
Rajah 22 menunjukkan struktur seekor ikan.

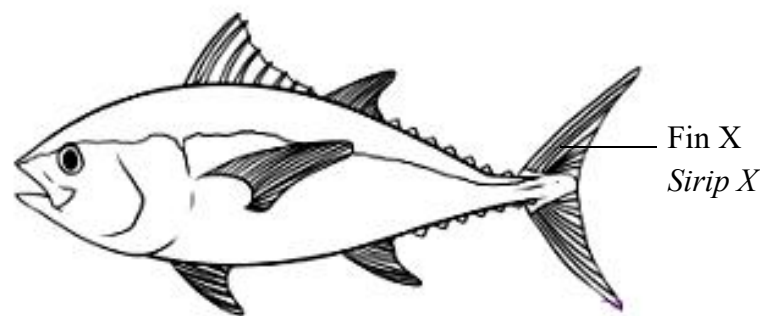


Diagram 22 / *Rajah 22*

What will happen to the fish if fin X is damaged?
Apa akan berlaku kepada ikan jika sirip X rosak?

- A The fish cannot prevent pitching
Ikan tidak boleh mencegah junaman
- B The fish cannot move forward
Ikan tidak boleh bergerak ke hadapan
- C The fish cannot change its direction
Ikan tidak boleh menukar haluan
- D The fish cannot prevent yawing and rolling
Ikan tidak boleh menghalang pesongan dan golekan

- 38 Diagram 23 shows a cross section of the human spinal cord.
Rajah 23 menunjukkan keratan rentas saraf tunjang manusia.

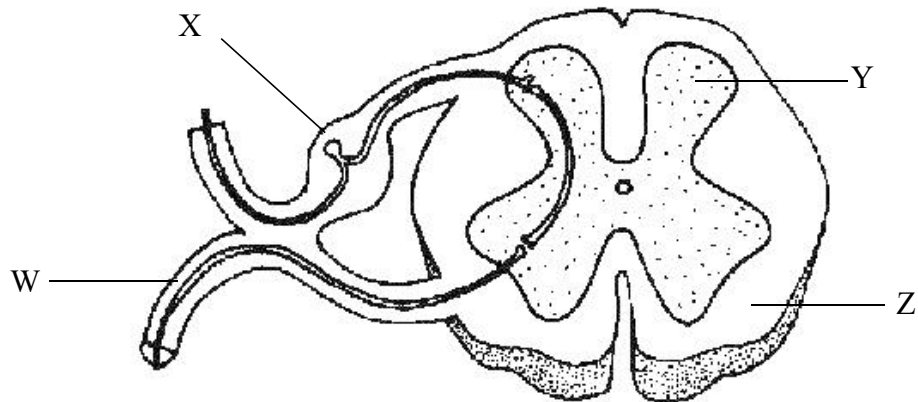


Diagram 23 / *Rajah 23*

Which part labelled W,X,Y or Z contain cell bodies of neurones?

Antara bahagian berlabel W, X, Y dan Z yang manakah mengandungi badan sel neuron?

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

- 39 Diagram 24 shows the structure of a nephron.
Rajah 24 menunjukkan struktur nefron.

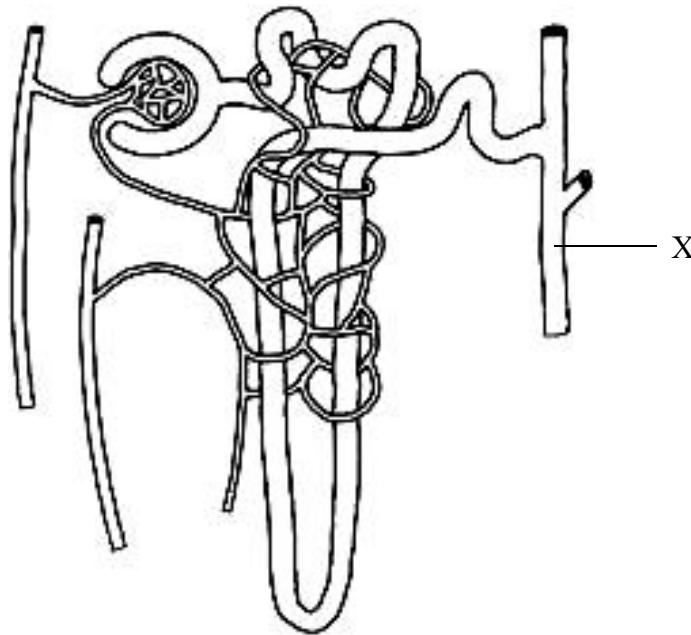


Diagram 24 / *Rajah 24*

Which of the following activities causes X to be more permeable to water?
Antara aktiviti berikut, yang manakah akan menyebabkan X lebih telap kepada air?

- A Not exercising
Tidak bersenam
- B Eating salty food
Makan makanan yang masin
- C Watching television
Menonton televisyen
- D Drinking a lot of water
Minum air yang banyak

- 40 Diagram 25 shows a method of producing fruit by using auxin hormone.
Rajah 25 menunjukkan cara menghasilkan buah dengan menggunakan hormon auksin.

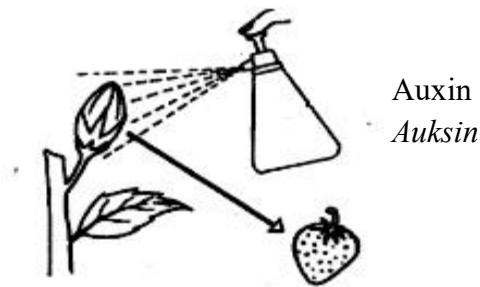


Diagram 25 / Rajah 25

What is the characteristic of the fruit formed?

Apakah ciri buah yang dihasilkan ?

- A The fruit is bigger
Buah itu lebih besar
- B The fruit has no seed
Buah itu tiada biji
- C The fruit is sweeter
Buah itu lebih manis
- D The fruit has more vitamin C
Buah itu mempunyai lebih vitamin C
- 41 A cell experiences the following changes during growth.
Satu sel mengalami perubahan berikut semasa proses tumbesaran.

- An increase in size of cell through intake of water from the surroundings
Penambahan saiz sel melalui pengambilan air dari persekitaran
- Involved vacuolation
Melibatkan pemvakuolan

What is the stage of growth shown?

Apakah peringkat pertumbuhan yang ditunjukkan?

- A Cell division stage
Peringkat pembahagian sel
- B Cell differentiation stage
Peringkat pembezaan sel
- C Cell maturation stage
Peringkat kematangan sel
- D Cell elongation stage
Peringkat pemanjangan sel

42 Which of the following are the functions of the placenta?
Antara berikut yang manakah merupakan fungsi plasenta?

- I Allows the exchange of nutrients between the mother and the foetus
Membenarkan pertukaran nutrien di antara ibu dengan fetus
 - II Protects the foetus by preventing the entry of certain pathogens and toxins from the mother
Melindungi fetus dengan menghalang kemasukan patogen dan toksin tertentu daripada ibu
 - III Produces luteinising hormone to stimulate ovulation
Menghasilkan hormon peluteinan untuk merangsang pengovulan
 - IV Inhibits the production of oestrogen
Merencat penghasilan estrogen
- A I and II
I dan II
 - B I and III
I dan III
 - C II and IV
II dan IV
 - D III and IV
III dan IV

43 Diagram 26 shows a cross section of a dicotyledonous stem.
Rajah 26 menunjukkan keratan rentas batang tumbuhan dikotiledon.

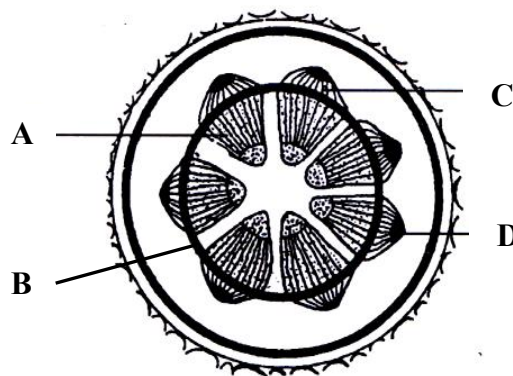


Diagram 26 / Rajah 26

Which part labelled A, B, C or D is the secondary phloem?
Antara bahagian berlabel A, B, C, dan D, yang manakah floem sekunder?

- 44 Diagram 27 shows the relationship between DNA, gene and chromosome.
Rajah 27 menunjukkan hubungan di antara DNA, gen dan kromosom.

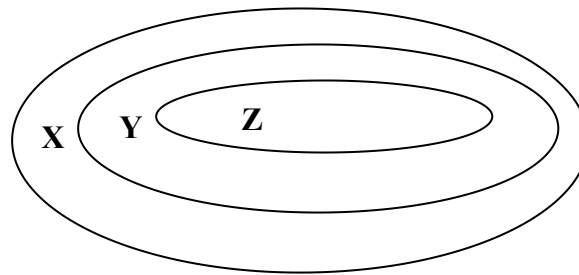


Diagram 27 / Rajah 27

What do X, Y and Z represent?

Apakah yang diwakili oleh X, Y dan Z?

	X	Y	Z
A	DNA <i>DNA</i>	Chromosome <i>Kromosom</i>	Gene <i>Gen</i>
B	Chromosome <i>Kromosom</i>	Gene <i>Gen</i>	DNA <i>DNA</i>
C	Gene <i>Gen</i>	DNA <i>DNA</i>	Chromosome <i>Kromosom</i>
D	DNA <i>DNA</i>	Gene <i>Gen</i>	Chromosome <i>Kromosom</i>

- 45 Rabbits which are heterozygous for black fur are crossbred among themselves. Black fur is dominant over white fur.

What is the ratio of genotypes of homozygote dominant, heterozygote and homozygote recessive which are possibly formed for the first filial generation (F1)?

Arnab yang heterozigot bulu hitam dikacukkan sesama sendiri. Bulu hitam adalah dominan ke atas bulu putih. Apakah nisbah genotip homozigot dominan, heterozigot dan homozigot resesif yang mungkin terhasil bagi generasi filial pertama (F1)?

	Homozygote dominant <i>Homozigot dominan</i>	Homozygote recessive <i>Homozigot resesif</i>	Heterozygote <i>Heterozigot</i>
A	1	2	1
B	1	1	2
C	2	1	1
D	2	2	0

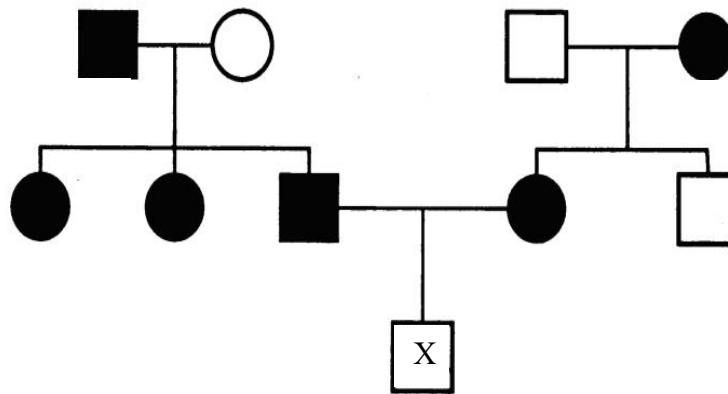
- 46 In peas, allele **Y** for yellow seeds, is dominant over allele **y** for green seeds. 200 heterozygous plants were self-pollinated and resulting 1498 yellow and a few green seeds. How many green seeds were produced?

*Pada pokok kacang pea, alel **Y** bagi biji kuning adalah dominan terhadap alel **y** bagi biji hijau. Sebanyak 200 tumbuhan heterozigot telah dikacukkan sesama sendiri dan menghasilkan 1498 biji benih kuning serta beberapa biji benih hijau. Berapakah jumlah biji benih hijau yang dihasilkan?*

- A 5000
B 2000
C 1000
D 500

- 47 Diagram 28 shows a family tree of human pedigree.

Rajah 28 menunjukkan carta pewarisan manusia.



Key / Kekunci	■	Male with black hair <i>Lelaki berambut hitam</i>
	●	Female with black hair <i>Perempuan berambut hitam</i>
	□	Male with brown hair <i>Lelaki berambut perang</i>
	○	Female with brown hair <i>Perempuan berambut perang</i>

Diagram 28 / Rajah 28

What is the probability of X to have brown hair?

Apakah kebarangkalian bagi X berambut perang?

- A 100%
B 75%
C 50%
D 25%

- 48 Diagram 29 are graphs showing variations A and B.
Rajah 29 menunjukkan graf untuk variasi A dan B.

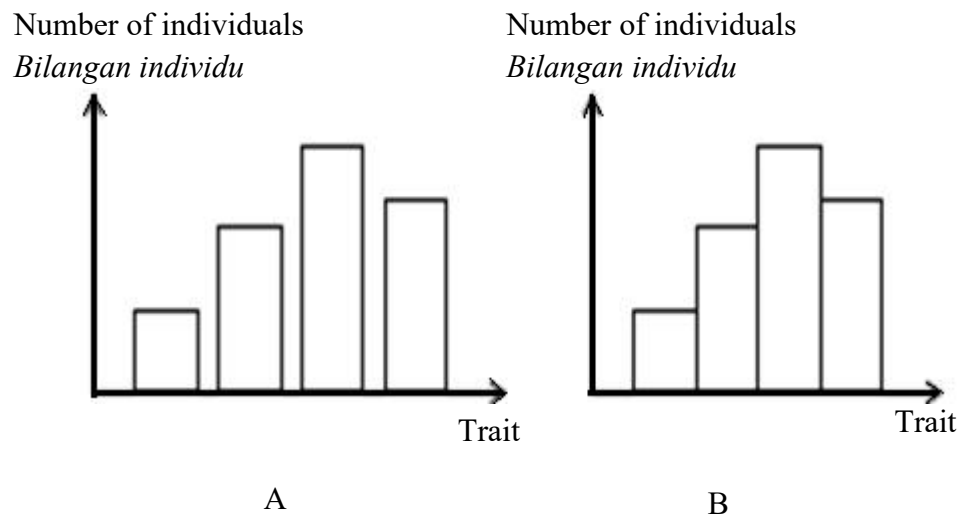


Diagram 29 / Rajah 29

What is the difference between variations A and B?
Apakah perbezaan antara variasi A dan variasi B?

	A	B
A	Controlled by several genes with several pairs of alleles <i>Dikawal oleh beberapa gen daripada beberapa pasangan alel</i>	Controlled by a single gene with two or more alleles. <i>Dikawal oleh gen tunggal dengan dua atau lebih alel.</i>
B	Example: Skin colour and height <i>Contoh: Warna kulit dan ketinggian</i>	Example: Blood group and shape of ear lobe <i>Contoh: Kumpulan darah dan bentuk cuping telinga</i>
C	Qualitative variation <i>Variasi kualitatif</i>	Quantitative variation <i>Variasi kuantitatif</i>
D	Normal distribution <i>Taburan Normal</i>	Discrete distribution <i>Taburan diskrit</i>

- 49 Diagram 30 shows a process of chromosome mutation.
Rajah 30 menunjukkan satu proses mutasi kromosom.

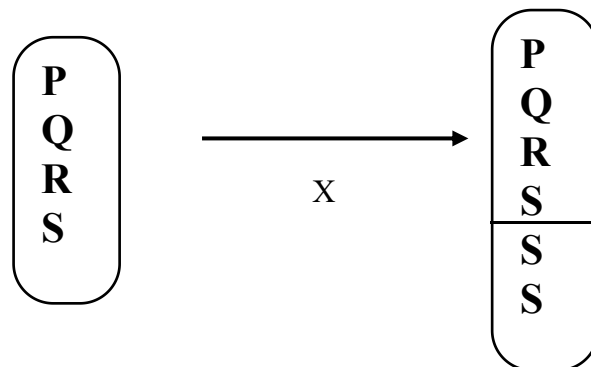


Diagram 30 / *Rajah 30*

What type of chromosomal mutation shown by X?

Apakah jenis mutasi kromosom yang ditunjukkan oleh X?

- A Insertion
Penyisipan
- B Inversion
Penyongsangan
- C Duplication
Penggandaan
- D Translocation
Translokasi
- 50 Which of the following are caused by gene mutation?
Antara berikut yang manakah disebabkan oleh mutasi gen?
- I Albinisme / *Albino*
 II Thalasemia / *Talasemia*
 III Turner's syndrome / *Sindrom Turner*
 IV Down's syndrome / *Sindrom Down*
- A I and II
I dan II
- B I and III
I dan III
- C II and IV
II dan IV
- D III and IV
III dan IV

END OF QUESTION PAPER
KERTAS PEPERIKSAAN TAMAT

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of **50** questions.
Kertas soalan ini mengandungi 50 soalan.

2. Answer **all** questions.
*Jawab **semua** soalan.*

3. Each question is followed by four alternative answers A, B, C or D. For each question, choose one answer only. Blacken your answer on the objective answer sheet provided.
*Tiap-tiap soalan diikuti oleh empat pilihan jawapan **A, B, C dan D.** bagi setiap soalan, pilih satu jawapan sahaja. Hitamkan jawapan anda pada kertas jawapan objektif yang disediakan.*

4. The diagrams in the questions are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.

5. If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.
Jika anda hendak menukar jawapan, batalkan jawapan yang telah dibuat. Kemudian tulis jawapan yang baharu.

6. You may use scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik.