

1. Which organelle is involved in the formation of spindle fibres?

*Organel manakah yang terlibat dalam pembentukan gentian gelendong?*

- |                              |                                |
|------------------------------|--------------------------------|
| A Nucleus<br><i>Nucleus</i>  | B Centriole<br><i>Sentriol</i> |
| C Lysosome<br><i>Lisosom</i> | D Ribosome<br><i>Ribosom</i>   |

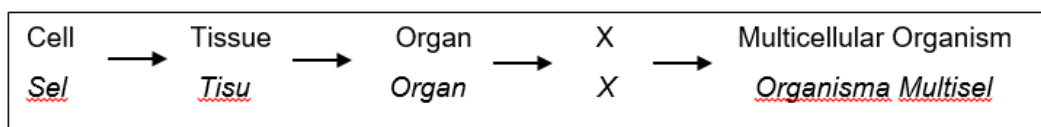
2. Collagen is the main structural protein in the extracellular space. It is the most abundant protein in mammals. The function of collagen is .....

*Kolagen adalah struktur utama dalam ruang di luar sel. Ia merupakan protein yang banyak dijumpai di dalam mamalia. Kolagen berfungsi .....*

- A As adipos tissue under the skin.  
*Sebagai tisu adipos di bawah kulit.*
- B As epithelium tissue in the skin.  
*Sebagai tisu epitelium di dalam kulit*
- C As myelin sheath in the nerve tissue.  
*Sebagai selaput mielin dalam tisu saraf.*
- D As a fibrous connective tissue to improve skin elasticity.  
*Sebagai tisu penghubung bergentian untuk memperbaiki keanjalan kulit.*

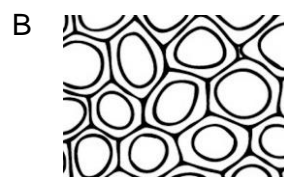
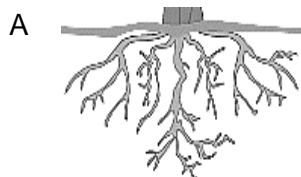
3. The following information shows the cell organisation in multicellular organisms.

*Maklumat berikut menunjukkan organisasi sel di dalam organisma multisel.*



Which is an example of X?

*Manakah suatu contoh bagi X?*



4. Diagram 1 shows a type of movement of molecules across the plasma membrane.  
*Rajah 1 menunjukkan sejenis pergerakan molekul-molekul merentasi membran plasma.*

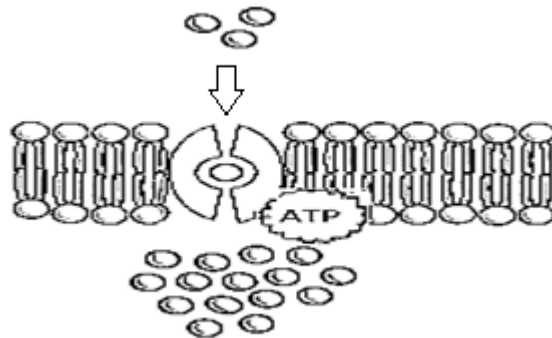


Diagram 1/Rajah 1

What type of movement is this?

*Apakah jenis pergerakan ini?*

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

5. Diagram 2 shows a substance moving across the plasma membrane.  
*Rajah 2 menunjukkan satu bahan bergerak merentasi membran plasma.*

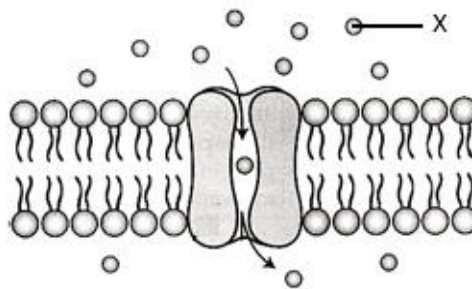


Diagram 2/Rajah 2

Which of the following is **not** substance X?

*Manakah antara berikut **bukan** bahan X?*

- |                                    |                                   |
|------------------------------------|-----------------------------------|
| A Oxygen<br><i>Oksigen</i>         | B Glucose<br><i>Glukosa</i>       |
| C Sodium ion<br><i>Ion natrium</i> | D Amino acid<br><i>Asid amino</i> |

6. Chef Wani finds that cucumber slices become harden when soaked in Solution Y.  
Which statement explain the situation?

*Chef Wani mendapati bahawa hirisan timun menjadi keras apabila direndam ke dalam Larutan Y.*

*Pernyataan manakah menerangkan situasi tersebut?*

- A Water diffuses into the cucumber slices by osmosis  
*Air meresap masuk ke hirisan timun secara osmosis*
- B Water diffuses out from the cucumber slices by osmosis  
*Air meresap keluar daripada hirisan timun secara osmosis*
- C Salt moves into the cucumber slices by active transport  
*Garam memasuki hirisan timun secara pengangkutan aktif*
- D Salt moves out from the cucumber slices by active transport  
*Garam keluar daripada hirisan timun secara pengangkutan aktif*
7. Diagram 3 shows the initial level of distilled water in a capillary tube at the beginning of an experiment.  
*Rajah 3 menunjukkan aras awal bagi air suling di dalam satu tiub kapilari pada permulaan eksperimen.*

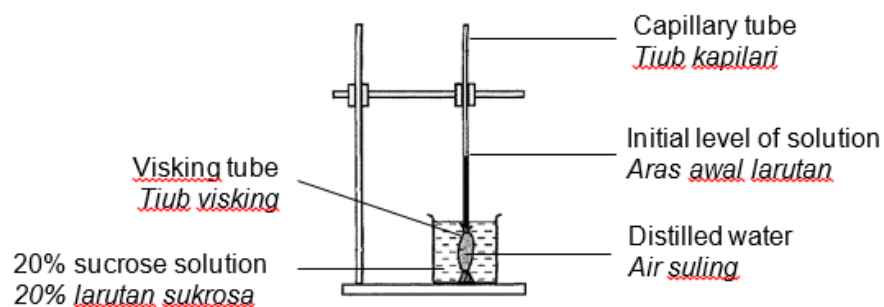
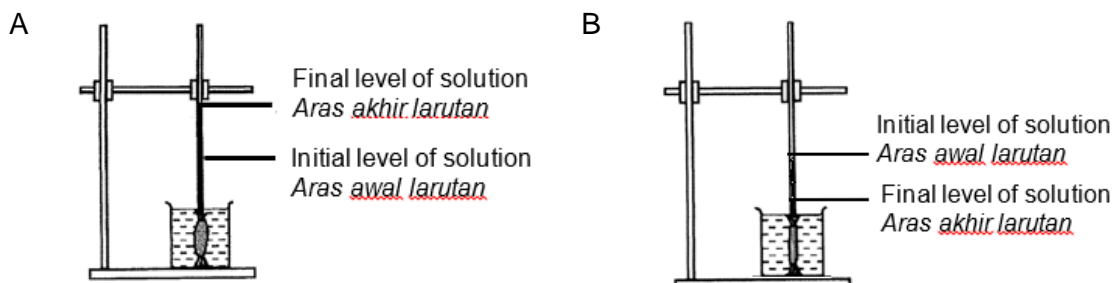
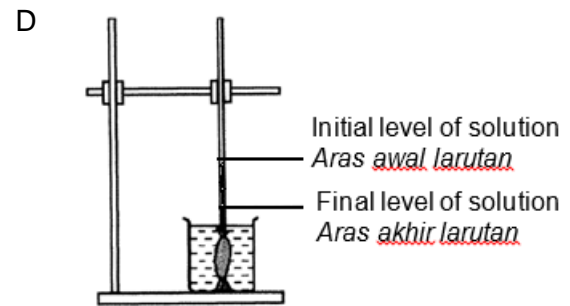
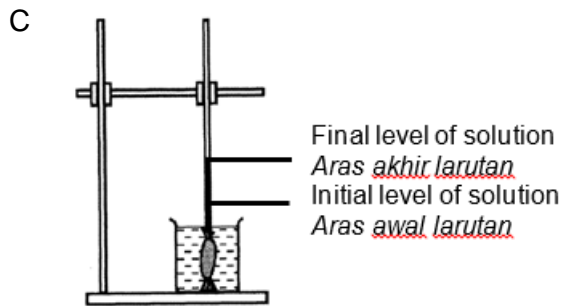


Diagram 3/Rajah 3

Which of the following shows the **correct** result at the end of the experiment?

*Manakah antara berikut menunjukkan keputusan yang betul pada akhir eksperimen?*





8. Which compound is in the same group as hormones?

*Sebatian manakah di dalam kumpulan yang sama seperti hormon?*

- |                                    |                                      |
|------------------------------------|--------------------------------------|
| A Steroid<br><i>Steroid</i>        | B Glycogen<br><i>Glikogen</i>        |
| C Hemoglobin<br><i>Haemoglobin</i> | D Phospholipids<br><i>Fosfolipid</i> |

9. Glycolipid is a combination of lipid and a type of long-chain carbohydrates.

What is the type of carbohydrates?

*Glikolipid merupakan gabungan lemak dengan sejenis karbohidrat berantai panjang.*

*Apakah jenis karbohidrat itu?*

- |  |  |
|--|--|
| A Triglycerides<br><i>Trigliserida</i>   | B Disaccharides<br><i>Disakarida</i>     |
| C Polysaccharides<br><i>Polisakarida</i> | D Monosaccharides<br><i>Monosakarida</i> |

- 10 Enzyme activities in the body are affected by temperature.

What will happen to a person with high fever?

*Aktiviti-aktiviti enzim di dalam badan dipengaruhi oleh suhu.*

*Apakah yang akan berlaku kepada seseorang yang mengalami demam panas?*

- |  |  |
|--|--|
| A Diarrhoea<br><i>Cirit-birit</i>      | B Constipation<br><i>Sembelit</i>                |
| C Indigestion<br><i>Ketidakhadaman</i> | D Loss of appetite<br><i>Hilang selera makan</i> |

- 11 Pak Ali put a few slice of pineapples in a container containing satay meat to tenderize the meat.

What is the appropriate action to be taken to speed up the process of marinating the meat?

*Pak Ali meletakkan hirisan nanas dalam bekas yang berisi daging satay untuk melembutkan daging tersebut.*

*Apakah tindakan yang sesuai dilakukan bagi mempercepatkan proses perapan daging itu?*

- A Add ice  
*Tambahkan ais*
- B Store at 39°C  
*Simpan pada suhu 39°C*
- C Add a pinch of salt  
*Tambahkan sedikit garam*
- D Make larger pieces of meat  
*Buat potongan daging yang lebih besar*

- 12 Diagram 4 shows the different phase of a cell cycle.

Rajah 4 menunjukkan fasa-fasa berbeza bagi suatu kitar sel.

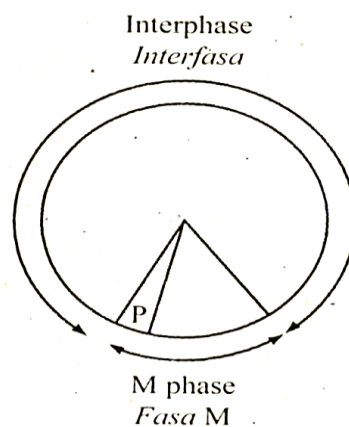


Diagram 4/Rajah 4

What is included in the interphase phase?

*Apakah yang termasuk dalam fasa interfasa?*

- A G1, S and G2  
*G1, S dan G2*
- B S, G2 and M  
*S, G2 dan M*
- C Cytokinesis, G1 and S  
*Sitokinesis, G1 dan S*
- D G2, M and Cytokinesis  
*G2, M dan Sitokinesis*

- 13 Diagram 5 shows a phase of meiosis in a cell.  
 . *Rajah 5 menunjukkan satu fasa meiosis di dalam sel.*

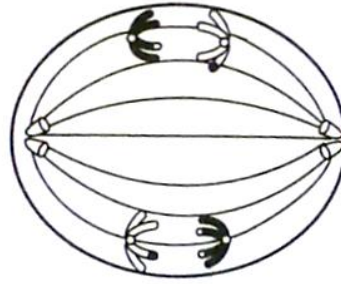


Diagram 5/Rajah 5

Name the phase?

*Namakan fasa tersebut?*

- |                                  |                                    |
|----------------------------------|------------------------------------|
| A Prophase 1<br><i>Profasa 1</i> | B Metaphase 2<br><i>Metafasa 2</i> |
| C Anaphase 1<br><i>Anafasa 1</i> | D Telophase 1<br><i>Telofasa 1</i> |

- 14 The following is the characteristic of a process in a type of cell division.  
 . *Berikut adalah ciri suatu proses dalam satu jenis pembahagian sel.*

Exchange of certain segments of the DNA chain  
between non-identical chromatids.

*Pertukaran segmen tertentu rantai DNA antara  
kromatid bukan seiras berlaku.*

Which of the following is **true** about the above process?

*Antara berikut, yang manakah **benar** mengenai proses di atas?*

- |  |
|--|
| A Mutation occur<br><i>Mutasi berlaku</i>  |
| B Occurs in mitosis<br><i>Berlaku dalam mitosis</i>  |
| C Occurs in the metaphase 1<br><i>Berlaku pada fasa metafasa 1</i>   |
| D Generates variation among species of organisms<br><i>Menghasilkan variasi dalam kalangan spesies organisma</i> |

- 15 Diagram 6 shows the chromosomes in the kidney cell of organisms X.  
*Rajah 6 menunjukkan kromosom dalam sel buah pinggang organisma X.*

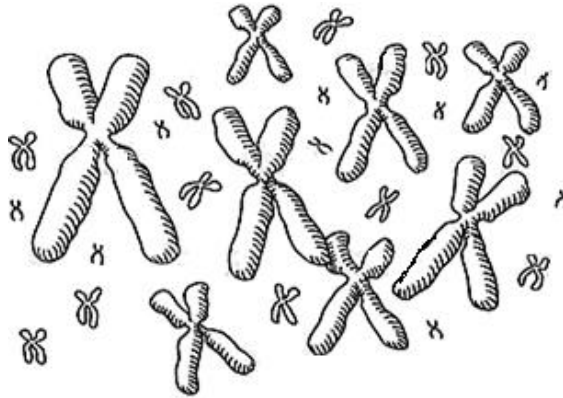


Diagram 6/Rajah 6

How many chromosomes is carried by the ovum of organism X?  
*Berapakah bilangan kromosom dibawa oleh ovum organisma X?*

- A 14  
B 15  
C 28  
D 30
- 16 Diagram 7 shows a boy.  
*Rajah 7 menunjukkan seorang budak lelaki.*



Diagram 7/Rajah 7

What is the type of nutrition for him?  
*Apakah jenis nutrisi beliau?*

- A Holozoic  
*Holozoik*  
B Autotroph  
*Autotroph*  
C Parasitism  
*Parasitisme*  
D Saprophytism  
*Saprotitisme*

17 Diagram 8 shows the oral condition of an individual.

*Rajah 8 menunjukkan keadaan di dalam mulut seorang individu.*

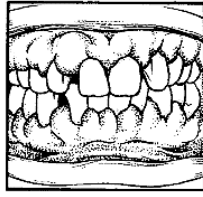


Diagram 8/Rajah 8

What disease is the individual experiencing?

*Apakah penyakit yang sedang dialami oleh individu berkenaan?*

A Ricket

*Riket*

B Scurvy

*Skurvi*

C Anaemia

*Anemia*

D Beri-beri

*Beri-beri*

18 Which class of food requires the presence of hydrochloric acid to be digested?

*Kelas makanan yang manakah memerlukan kehadiran asid hidroklorik untuk dicernakan?*

A Fibre

*Serat*

B Lipid

*Lipid*

C Protein

*Protein*

D Carbohydrate

*Karbohidrat*

19 Diagram 9 shows the structure of chloroplast.

*Rajah 9 menunjukkan struktur kloroplas.*

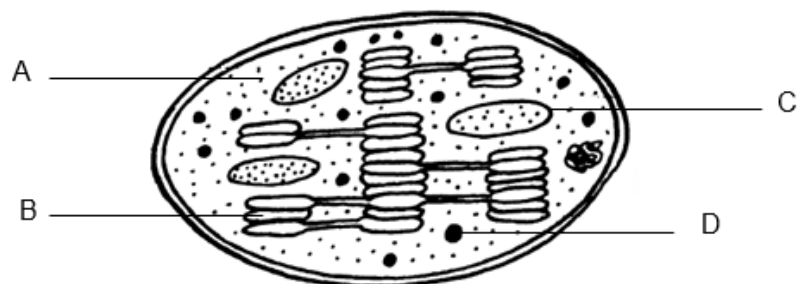


Diagram 9/Rajah 9

Which parts labeled A, B, C and D are involved in the light reaction?

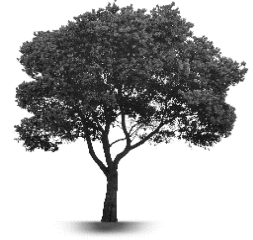
*Bahagian berlabel A, B, C dan D yang manakah terlibat dalam tindak balas cahaya?*



20 The following are the effects of a macronutrient deficiency in plant.

*Berikut adalah kesan-kesan kekurangan satu makronutrient pada tumbuhan.*

- ✓ Unhealthy root growth  
*Pertumbuhan akar tidak sihat*
- ✓ Leaf formation is dark green and dull  
*Pembentukan daun berwarna hijau tua dan kusam*
- ✓ Red or purple spots appear on old leaves  
*Bintik merah atau ungu kelihatan pada daun tua*

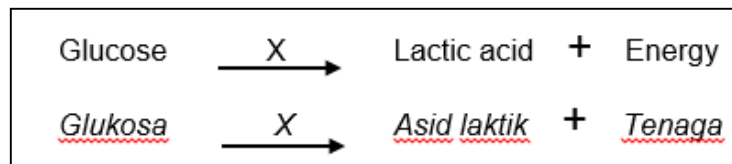


Based on the information provided, what are the name of the macronutrient involved?

*Berdasarkan kepada maklumat yang diberikan, apakah nama makronutrien yang terlibat?*

- |                                 |                                   |
|---------------------------------|-----------------------------------|
| A Potassium<br><i>Kalium</i>    | B Phosphorus<br><i>Fosforus</i>   |
| C Magnesium<br><i>Magnesium</i> | D Molibdenum<br><i>Molibdenum</i> |

21 The following is the word equation for the energy production through process X. *Berikut ialah persamaan perkataan bagi penghasilan tenaga melalui proses X.*



*What is X?*

*Apakah X?*

- A External respiration  
*Respirasi luar*
- B Aerobic respiration  
*Respirasi aerob*
- C Anaerobic respiration in yeast  
*Respirasi anaerob dalam yis*
- D Anaerobic respiration in human muscles  
*Respirasi anaerob dalam otot manusia*

- 22 How does fish maximise the efficiency of gaseous exchange?  
*Bagaimanakah ikan memaksimumkan kecekapan pertukaran gas?*
- A Closing of the mouth and operculum  
*Penutupan mulut dan operkulum*
  - B Opening of the mouth and operculum  
*Pembukaan mulut dan operkulum*
  - C The opposite direction of water and blood flow through the gills  
*Arah pengaliran air dan darah yang bertentangan melalui insang*
  - D The same direction of flow of water and blood through the gills  
*Arah pengaliran air dan darah yang sama melalui insang*
- 23 Which mechanism will occur if the pH value of the human blood decrease?  
*Mekanisme manakah yang akan berlaku jika nilai pH darah manusia menurun?*
- A Respiratory and ventilation rate decreased  
*Kadar pernafasan dan ventilasi menurun*
  - B Respiratory and ventilation rate increased  
*Kadar pernafasan dan ventilasi meningkat*
  - C Breathing rate increases but ventilation rate decreases  
*Kadar pernafasan meningkat tetapi kadar ventilasi menurun*
  - D Breathing rate decreases but ventilation rate increases  
*Kadar pernafasan menurun tetapi kadar ventilasi meningkat*

- 24 Diagram 10 shows the graph of the relationship between absorption and release of carbon dioxide and light intensity.

*Rajah 10 menunjukkan graf hubungan antara penyerapan dan pembebasan karbon dioksida dengan keamatan cahaya.*

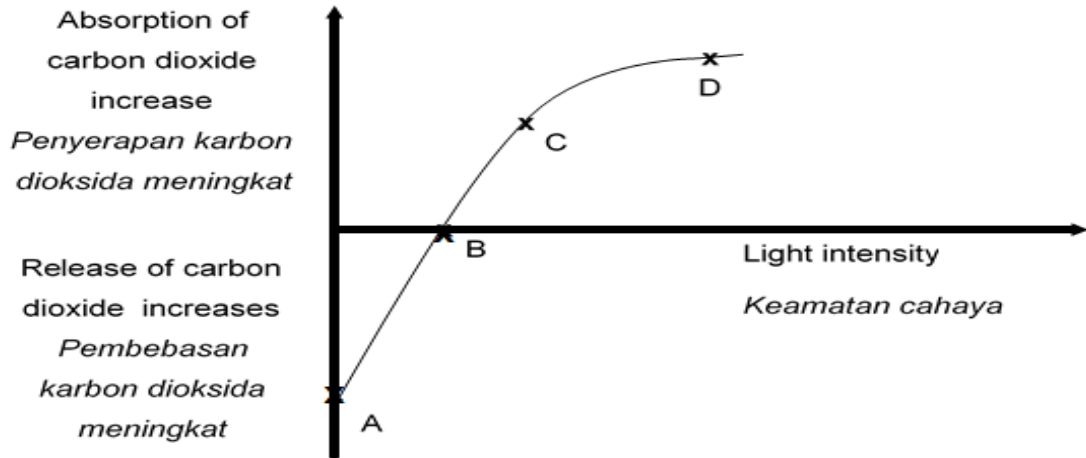


Diagram 10/Rajah 10

At which point, A, B, C or D, is the absorption of carbon dioxide equal to the release of carbon dioxide?

*Pada titik manakah, A, B, C atau D, penyerapan karbon dioksida sama dengan pembebasan karbon dioksida?*

- 25 The following information is about two conditions of planting plants R and S.

*Maklumat berikut adalah tentang dua keadaan penanaman tumbuhan R dan tumbuhan S.*

Plant R/ <i>Tumbuhan R</i>	Planted in highland / <i>Ditanam di tanah tinggi</i>
Plant S/ <i>Tumbuhan S</i>	Planted in waterlogged area/ <i>Ditanam di kawasan air bertakung</i>

Which of the following are the products of roots respiration in plants R and S?

*Antara yang berikut, yang manakah adalah hasil respirasi akar bagi tumbuhan R dan S?*

	Plant R / <i>Tumbuhan R</i>	Plant S / <i>Tumbuhan S</i>
A	Carbon dioxide and water <i>Karbon dioksida dan air</i>	Ethanol and carbon dioxide <i>Etanol dan karbon dioksida</i>
B	Lactic acid and carbon dioxide <i>Asid laktik dan karbon dioksida</i>	Ethanol and carbon dioxide <i>Etanol dan karbon dioksida</i>
C	Ethanol and carbon dioxide <i>Etanol dan karbon dioksida</i>	Lactic acid and carbon dioxide <i>Asid laktik dan karbon dioksida</i>
D	Ethanol and carbon dioxide <i>Etanol dan karbon dioksida</i>	Ethanol and carbon dioxide <i>Etanol dan karbon dioksida</i>

26 Which of the following is **not** an abiotic components in an ecosystem?

*Antara yang berikut, yang manakah merupakan **bukan** komponen abiotik di bawah faktor topografi?*

A Aspect

*Aspek*

B Altitude

*Altitud*

C pH value

*Nilai pH*

D Gradient

*Kecerunan*

27 Which is the **correct** sequence of ecological changes that occur to a barren land over a long period of time?

*Urutan yang manakah **betul** tentang perubahan ekologi yang berlaku pada tanah tandus untuk satu tempoh yang panjang?*

A Colonisation, climax community, succession, dominant species

*Pengkolonian, komuniti kompleks, sesaran, spesies dominan*

B Succession, colonisation, climax community, dominant species

*Sesaran, pengkolonian, komuniti klimaks, spesies dominan*

C Colonisation, succession, dominant species, climax community

*Pengkolonian, sesaran, spesies dominan, komuniti klimaks*

D Succession, colonisation, dominant species, climax community,

*Sesaran, pengkolonian, spesies dominan, komuniti klimaks,*

28 Diagram 11 below shows a kind of fungi on the surface of a dead wooden trunk.

*Rajah 11 di bawah menunjukkan sejenis kulat pada permukaan batang kayu mati.*



Diagram 11 /Rajah 11

What is the short term effect if there are **no** fungi?

*Apakah kesan jangka pendek sekiranya **tiada** kulat?*

- A Less oxygen gas is produced  
*Kurang gas oksigen dihasilkan*
- B The soil would gradually become less fertile  
*Tanah akan menjadi kurang subur secara perlahan-lahan*
- C Atmospheric nitrogen cannot be fixed by bacteria  
*Nitrogen atmosfera tidak dapat diikat oleh bakteria*
- D Nutrients from dead organism cannot be broken down  
*Nutrien daripada organisma yang mati tidak dapat diuraikan.*

29 A group of student wants to estimate the size of a rat population in an oil palm plantation. The student caught and marked 38 rats on the first day. A week later the student caught 45 rats, 10 of them were found marked. Estimate the population size of the rat?  
*Sekumpulan murid ingin menganggarkan saiz populasi tikus dalam sebuah ladang kelapa sawit. Murid tersebut menangkap dan menandakan 38 ekor tikus pada hari pertama. Seminggu selepas itu, murid tersebut menangkap 45 ekor tikus, 10 daripadanya didapati bertanda. Anggarkan saiz populasi tikus itu?*

- A 171
- B 176
- C 180
- D 185

30 Which of the following gases destroy the ozone layer?

*Antara gas berikut, yang manakah memusnahkan lapisan ozon?*

- A Methane  
*Metana*
- B Nitrous oxide  
*Nitrus oksida*
- C Carbon dioxide  
*Karbon dioksida*
- D Chlorofluorocarbon  
*Klorofluorokarbon*

31 Diagram 12 shows the graph of concentration of dissolved oxygen at location A, B, C and D along Indera River.

Rajah 12 menunjukkan graf kepekatan oksigen terlarut di lokasi A, B, C dan D di sepanjang Sungai Indera.

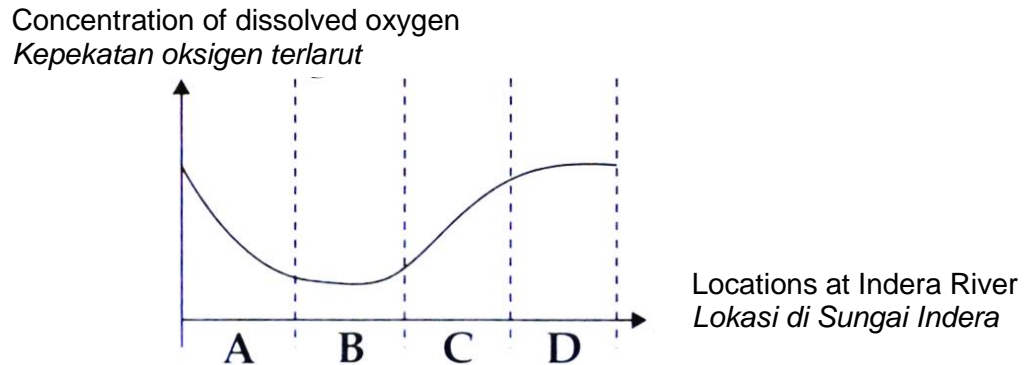


Diagram 12/Rajah 12

Predict the most suitable waste found in each location to explain the graph above.

Ramalkan bahan buangan yang paling tepat bagi setiap lokasi untuk menerangkan graf di atas.

- |                                   |                                     |
|-----------------------------------|-------------------------------------|
| A Wood<br>Kayu                    | B Hot water<br>Air panas            |
| C Food plastic<br>Plastik makanan | D Food balance<br>Saki baki makanan |

32 Diagram 13 shows activities that cause a phenomenon.

Rajah 13 menunjukkan aktiviti-aktiviti yang menyebabkan suatu fenomena.

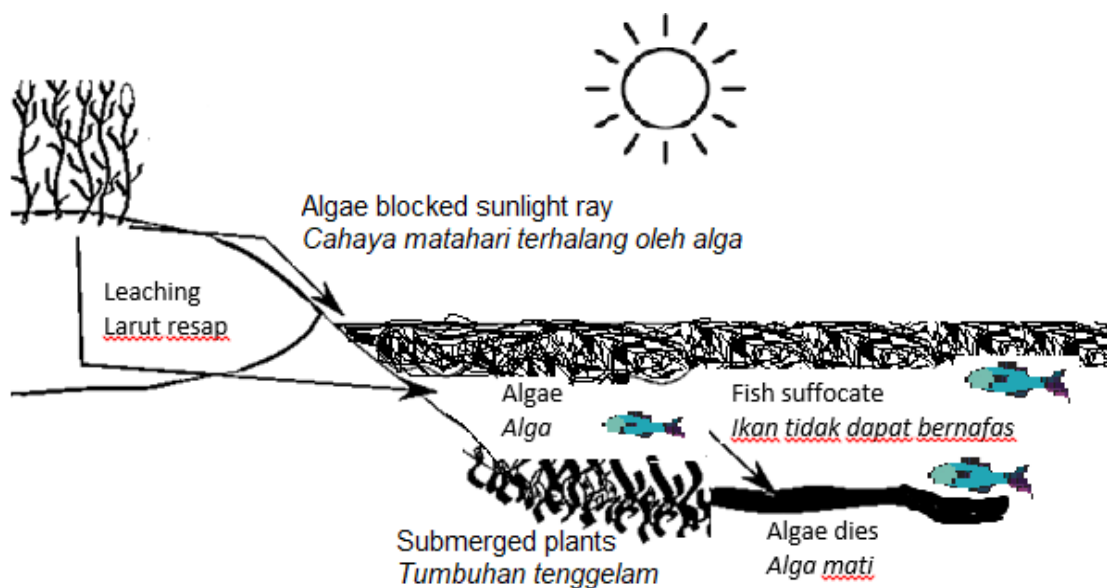


Diagram 13/Rajah 13

What is the phenomenon and the substance involved?

Apakah fenomena itu dan bahan yang terlibat?

	Phenomenon <i>Fenomena</i>	Substance <i>Bahan</i>
A	Eutrophication <i>Eutrofikasi</i>	Excess fertilizer <i>Lebihan baja</i>
B	Soil erosion <i>Hakisan tanah</i>	Rain <i>Hujan</i>
C	Water pollution <i>Pencemaran air</i>	Mud <i>Lumpur</i>
D	Thermal pollution <i>Pencemaran terma</i>	Hot water <i>Air panas</i>

33 Which organism has an open blood circulatory system?

Antara organisma berikut, yang manakah mempunyai sistem peredaran darah terbuka?

A Fish

*Ikan*

B Frog

*Katak*

C Buffalo

*Kerbau*

D Dragonfly

*Pepatung*

34 Diagram 14 shows four components of human blood.

Rajah 14 menunjukkan empat komponen darah manusia.

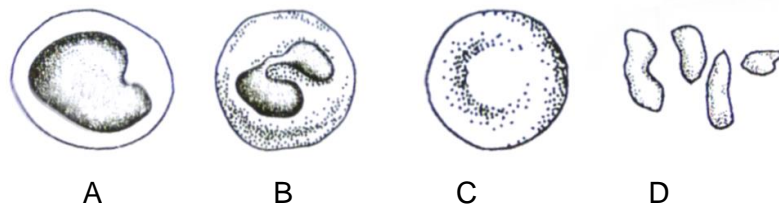


Diagram 14/Rajah 14

Which of the component labelled A, B, C and D produce antibodies?

Komponen manakah yang berlabel A, B, C dan D yang menghasilkan antibodi?

- 35 Which combination of environmental conditions cause stoma opening in plants?  
*Kombinasi keadaan persekitaran yang manakah menyebabkan pembukaan stoma dalam tumbuhan?*

	Temperature <i>Suhu</i>	Air movement <i>Pergerakan udara</i>	Rate of transpiration <i>Kadar transpirasi</i>
A	15 °C	High <i>Tinggi</i>	High <i>Tinggi</i>
B	19 °C	Low <i>Rendah</i>	Low <i>Rendah</i>
C	26 °C	High <i>Tinggi</i>	High <i>Tinggi</i>
D	32 °C	High <i>Tinggi</i>	Low <i>Rendah</i>

- 36 Diagram 15 shows a plant.  
*Rajah 15 menunjukkan sejenis tumbuhan.*

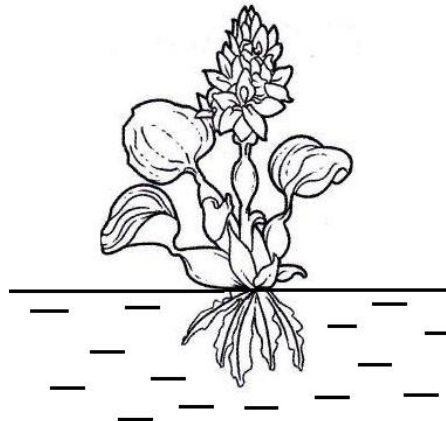


Diagram 15/Rajah 15

- Which of the following tissues provide support for the plant?  
*Antara tisu berikut, yang manakah memberi sokongan kepada tumbuhan itu?*
- |  |   |
|--|---|
| A Parenchyma tissues<br><i>Tisu parenkima</i>  | B Aerenchyma tissues<br><i>Tisu aerenkima</i>     |
| C Collenchyma tissues<br><i>Tisu kolenkima</i> | D Sclerenchyma tissues<br><i>Tisu sklerenkima</i> |



- 37 Diagram 16 shows the muscles of the hind leg of a grasshopper.  
*Rajah 16 menunjukkan otot-otot pada kaki belakang seekor belalang.*

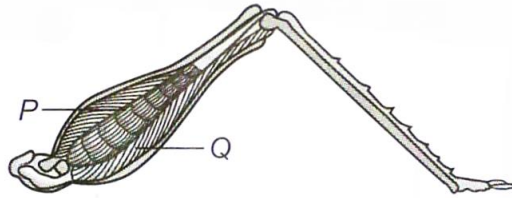


Diagram 16 / *Rajah 16*

Which of the following is **correct** about the action of muscles P and Q when the grasshopper is ready to jump?

*Antara yang berikut, yang manakah betul tentang tindakan otot P dan Q apabila belalang bersedia untuk melompat?*

	P	Q
A	Contracts <i>Mengecut</i>	Relaxes <i>Mengendur</i>
B	Contracts <i>Mengecut</i>	Contracts <i>Mengecut</i>
C	Relaxes <i>Mengendur</i>	Relaxes <i>Mengendur</i>
D	Relaxes <i>Mengendur</i>	Contracts <i>Mengecut</i>

- 38 Which of the following is an internal stimulus of an organism?  
*Antara berikut yang manakah adalah rangsangan dalam bagi suatu organisma?*

- |   |   |
|---|---|
| A Light intensity<br><i>Keamatan cahaya</i>     | B Body temperature<br><i>Suhu badan</i>             |
| C Music from a radio<br><i>Muzik dari radio</i> | D Surrounding temperature<br><i>Suhu sekeliling</i> |

39 Which hormone is secreted by pituitary gland?

*Hormon manakah yang dirembeskan kelenjar pituitari?*

A Glucagon hormone

B Aldosterone hormone

*Hormon Glukagon*

*Hormon Aldosteron*

C Luteinising hormone

D Progesterone hormone

*Hormon Peluteinan*

*Hormon Progesteron*

40 Diagram 17 shows how blood glucose level is maintain in the human body.

*Rajah 17 menunjukkan bagaimana aras glukosa darah dikekalkan dalam badan manusia.*

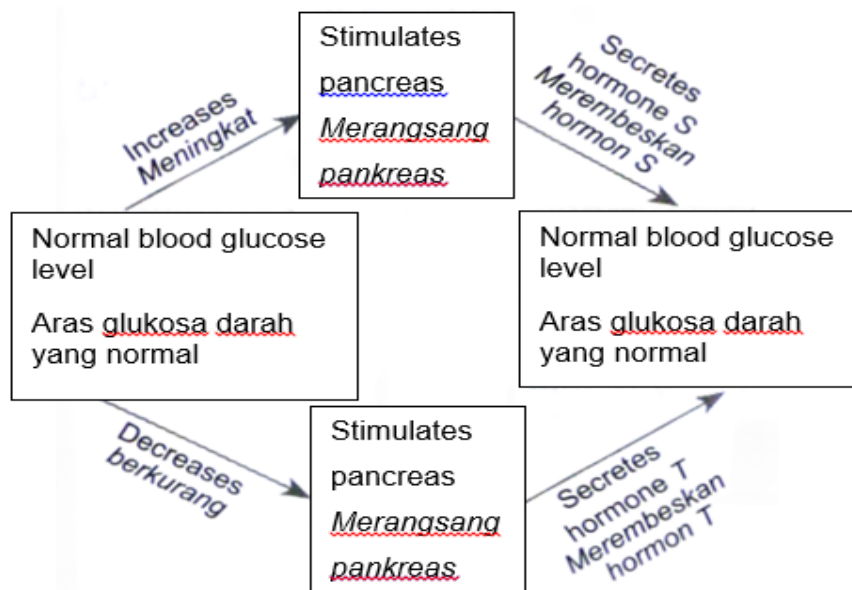


Diagram 17 / Rajah 17

Which of the following are hormones S and T?

*Antara yang berikut, yang manakah hormon S dan T?*

	S	T
A	Glycogen <i>Glikogen</i>	Insulin <i>Insulin</i>
B	Insulin <i>Insulin</i>	Glycogen <i>Glikogen</i>
C	Glucagon <i>Glukagon</i>	Insulin <i>Insulin</i>
D	Insulin <i>Insulin</i>	Glucagon <i>Glukagon</i>

41 Diagram 18 shows parts of the human brain.

*Rajah 18 menunjukkan bahagian-bahagian otak manusia.*

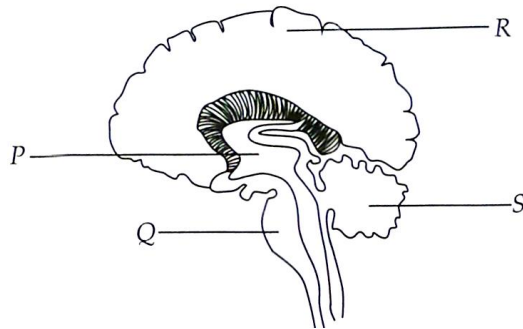


Diagram 18 / *Rajah 18*

Janet had an accident and injured her head. She has lost her vision.

Which of the following parts of the brain was injured?

*Janet telah kemalangan dan mengalami kecederaan di kepala. Beliau telah kehilangan penglihatan.*

*Antara bahagian otak berikut, yang manakah mengalami kecederaan?*

A P

B Q

C R

D S

42 Diagram 19 shows the male reproduction system.

*Rajah 19 menunjukkan sistem pembiakan lelaki.*

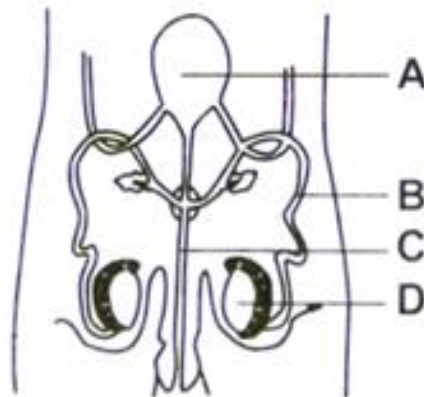


Diagram 19 / *Rajah 19*

Which part, A, B, C or D contains the cells with 23 number of chromosomes??

*Antara bahagian, A, B, C dan D yang manakah mengandungi sel-sel dengan 23 kromosom?*

43 Diagram 20 shows the tissues of a monocotyledonous stem.

*Rajah 20 menunjukkan tisu bagi batang monokotiledon.*

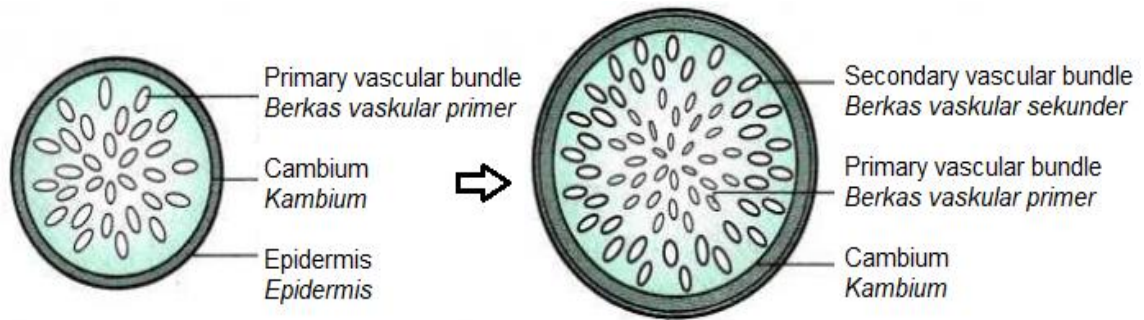


Diagram 20/Rajah 20

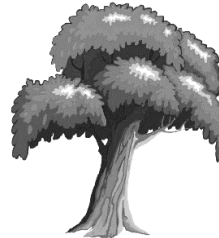
Which plant is experiencing growth as in the diagram above?

*Tumbuhan manakah yang mengalami pertumbuhan seperti rajah di atas?*

A



B



C



D



44 Diagram 21 shows cells in the embryo sac of a dicotyledonous plant.

*Rajah 21 menunjukkan sel-sel di dalam pundi embrio suatu tumbuhan dikotiledon.*

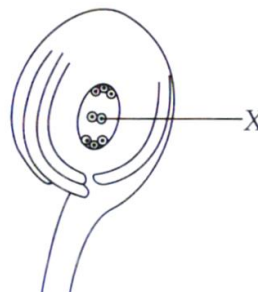


Diagram 21/Rajah 21

What is the product of fertilisation between a male gamete and X cell?

*Apakah hasil persenyawaan antara garnet jantan dengan sel X?*

- |   |   |
|---|---|
| A Fruit<br><i>Buah</i>                  | B Seed<br><i>Biji benih</i>                   |
| C Diploid zygote<br><i>Zigot diplod</i> | D Triploid nucleus<br><i>Nukleus triploid</i> |

45 Diagram 22 shows the calendar month of August 2020. A woman starts her menstruation on the 13th August 2020 and end on the 17th August 2020

*Rajah 22 di bawah menunjukkan kalendar bulan Ogos 2020. Seorang wanita mula mengalami haid bermula pada 13 Ogos 2020 dan tamat pada 17 Ogos 2020.*

**August 2020 / Ogos 2020**

Su	mo	tue	wed	thu	fri	sa
Ahad	Isnin	selasa	rabu	khamis	jumaat	sabtu
						<b>1</b>
<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>
<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>
<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>
<b>30</b>	<b>31</b>					

*Diagram 22/Rajah 22*

Based on the diagram state the date of the ovulation?

Berdasarkan rajah di atas nyatakan tarikh ovulasi berlaku?

- |   |   |
|---|---|
| A 26th August 2020<br><i>26 Ogos 2020</i> | B 28th August 2020<br><i>28 Ogos 2020</i> |
| C 30th August 2020<br><i>30 Ogos 2020</i> | D 31st August 2020<br><i>31 Ogos 2020</i> |
- 46 The genotype of a person blood group is  $I^B I^O$ . What is his blood group?  
*Genotip kumpulan darah seorang individu ialah  $I^B I^O$ . Apakah kumpulan darah individu itu?*
- |     |      |
|-----|------|
| A O | B A  |
| C B | D AB |

47 Diagram 23 show the karyotype of individual L.

Rajah 23 menunjukkan kariotip individu L.

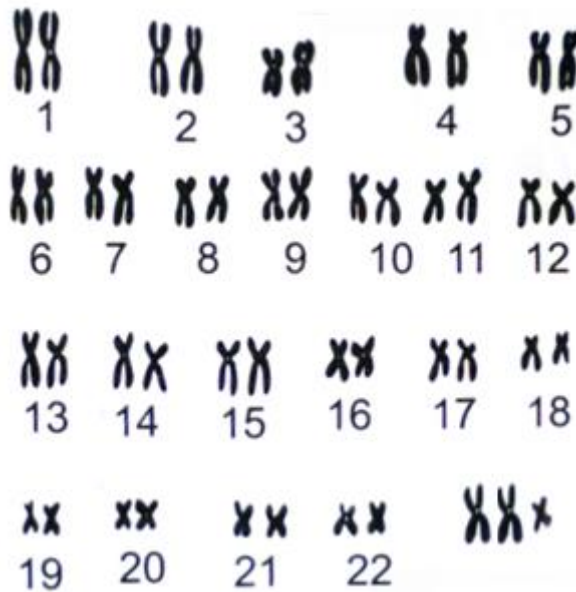


Diagram 23/ Rajah 23

Identify the sex, genetic disorder and genotype of individual L.

Kenal pasti jantina, kecacatan genetik dan genotip bagi individu L.

	Sex <i>Jantina</i>	Genetic disorder <i>kecacatan genetik</i>	Genotype <i>Genotip</i>
A	Male <i>Lelaki</i>	Turner syndrome <i>Sindrom Turner</i>	44 + XXY
B	Female <i>Perempuan</i>	Turner syndrome <i>Sindrom Turner</i>	45 + XXY
C	Female <i>Perempuan</i>	Down syndrome <i>Sindrom Down</i>	45 + XX
D	Male <i>Lelaki</i>	Klinefelter syndrome <i>Sindrom Klinefelter</i>	44 + XXY

48 Which factor cause haemophilia?

Faktor manakah yang menyebabkan hemofilia?

A Gene mutation

*Mutasi gen*

B Chromosome mutation

*Mutasi kromosom*

C Random fertilisation

*Persenyawaan secara rawak*

D Independent assortment of chromosomes

*Penyusunan rawak kromosom*

49 What is the sequence of the bases on the complementary strand of DNA if the bases on one strand are CTT GTA TGC?

*Apakah urutan bes pada satu rantai DNA jika bes pada rantai yang satu lagi ialah CTT GTA TGC?*

A GCC ATT CAG

B GAA CAT ACG

C TAA CAT ATC

D AGG TCC GTA

50 Diagram 24 (a) and 24 (b) show two sisters fingerprint patterns.

*Rajah 24 (a) dan 24 (b) menunjukkan corak cap jari dua adik-beradik perempuan.*



Diagram 24(a) / Rajah 24(a)



Diagram 24(b)/Rajah 24(b)

What is the cause of this condition?

*Apakah yang menyebabkan keadaan ini?*

A Determined by single gene

*Ditentukan oleh satu gen tunggal*

B Determine by more than one gene

*Ditentukan oleh lebih dari satu gen*

C Affected by environmental factor

*Dipengaruhi oleh faktor persekitaran*

D Affected by genetic and environmental factor

*Dipengaruhi oleh faktor genetik dan faktor persekitaran*

END OF QUESTION PAPER

KERTAS SOALAN TAMAT