

**SULIT**  
**4551/1**  
**Biologi**  
**Kertas 1**  
**Sept 2019**  
**1 1/4 jam**

**MPSM**

**PEPERIKSAAN PERCUBAAN SPM 2019**  
**SIJIL PELAJARAN MALAYSIA**

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**BIOLOGI**

Kertas 1

Satu jam lima belas minit

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***JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU***

1. *Kertas soalan ini mengandungi 50 soalan.*
2. *Kertas soalan ini disediakan dalam dwibahasa.*
3. *Jawab semua soalan.*
4. *Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan yang disediakan.*
5. *Sekiranya anda hendak menukarkan jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*
6. *Rajah yang mengiringi soalan dimaksudkan untuk memberi maklumat yang berguna bagi menjawab soalan. Rajah tidak dilukis mengikut skala kecuali dinyatakan.*
7. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*

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***Kertas soalan ini mengandungi 27 halaman bercetak***

- 1 Diagram 1 shows a plant cell.  
*Rajah 1 menunjukkan satu sel tumbuhan.*

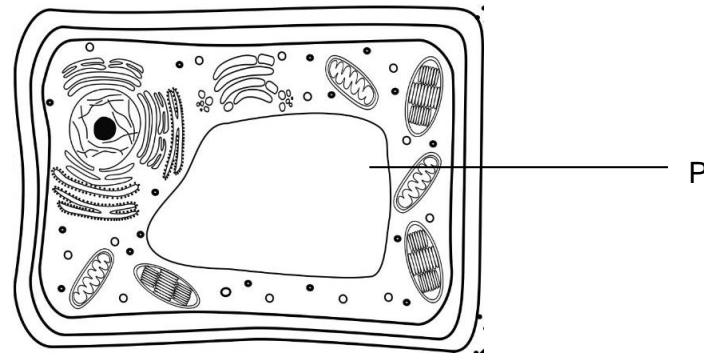


Diagram 1/ *Rajah 1*

What is the function of P?  
*Apakah fungsi P?*

- A Controlling plant osmotic pressure  
*Mengawal tekanan osmosis tumbuhan*
  - B Give support to herbaceous plant  
*Memberi sokongan kepada tumbuhan herba*
  - C Provide nutrient to plant cells  
*Membekalkan nutrien kepada sel tumbuhan*
  - D Maintain the shape of the plant cell  
*Mengekalkan bentuk sel tumbuhan*
- 2 Which of the following functions in connecting muscle to bone?  
*Antara berikut yang manakah berfungsi menghubungkan otot dan tulang?*

- |   |                              |
|---|------------------------------|
| A Skeletal muscle<br><i>Otot rangka</i> | C Ligament<br><i>Ligamen</i> |
| B Cartilage<br><i>Rawan</i>             | D Tendon<br><i>Tendon</i>    |

- 3 Diagram 2 shows the structure of a chloroplast.  
*Rajah 2 menunjukkan struktur kloroplas.*

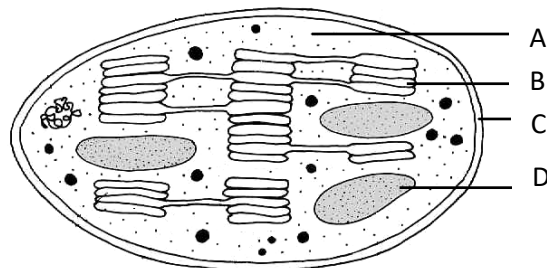


Diagram 2 / *Rajah 2*

Where does the dark reaction of photosynthesis occur?  
*Di manakah tindak balas gelap fotosintesis berlaku?*

- 4 Diagram 3 shows the structure of a plasma membrane.  
*Rajah 3 menunjukkan struktur membran plasma.*

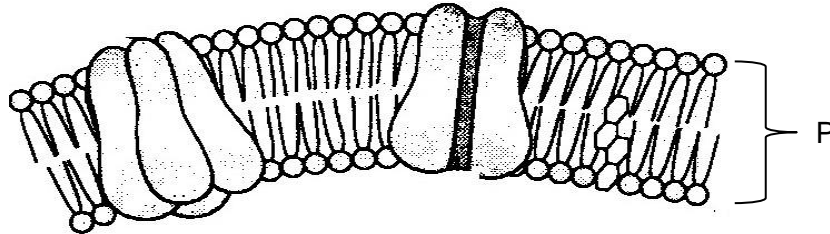


Diagram 3 / *Rajah 3*

What is the part labelled P?  
*Apakah bahagian yang berlabel P?*

- |   |                                  |   |  |
|---|----------------------------------|---|--|
| A | Hydrophilic<br><i>Hidrofilik</i> | C | Hydrophobic<br><i>Hidrofobik</i>                     |
| B | Lipid<br><i>Lipid</i>            | D | Phospholipid bilayer<br><i>Dwilapisan fosfolipid</i> |
- 5 Diagram 4 shows the structure of red blood cell when immersed in distilled water.  
*Rajah 4 menunjukkan struktur sel darah merah apabila direndam di dalam air suling.*

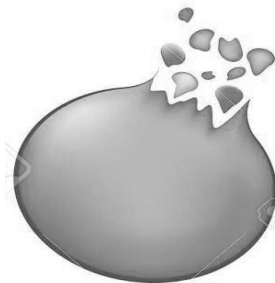


Diagram 4 / *Rajah 4*

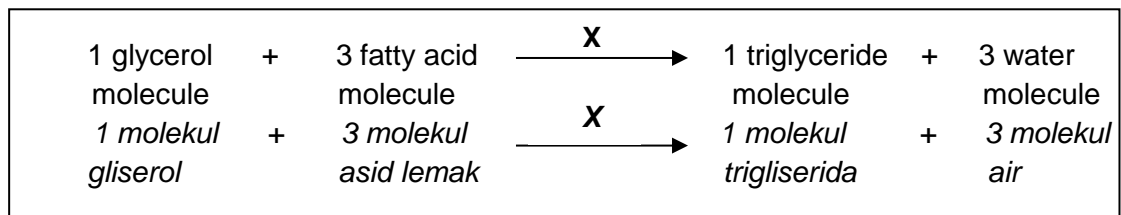
What happened to the cell?  
*Apakah yang telah berlaku kepada sel tersebut?*

- |   |                               |   |                                       |
|---|-------------------------------|---|---------------------------------------|
| A | Hemolysis<br><i>Hemolisis</i> | C | Plasmolysis<br><i>Plasmolisis</i>     |
| B | Crenation<br><i>Krenasi</i>   | D | Deplasmolysis<br><i>Deplasmolisis</i> |

- 6 Which of the following carbohydrates is a polysaccharide?  
*Antara karbohidrat berikut, yang manakah merupakan polisakarida?*

- |   |                             |   |                             |
|---|-----------------------------|---|-----------------------------|
| A | Maltose<br><i>Maltosa</i>   | C | Glucose<br><i>Glukosa</i>   |
| B | Fructose<br><i>Fruktosa</i> | D | Glycogen<br><i>Glikogen</i> |

- 7 The equation shows a process in the formation of triglyceride.  
*Persamaan menunjukkan satu proses dalam pembentukan trigliserida..*



What is process **X**?  
*Apakah proses **X** ?*

- |   |                                   |   |                               |
|---|-----------------------------------|---|-------------------------------|
| A | Hydrolysis<br><i>Hidrolisis</i>   | C | Evaporation<br><i>Sejatan</i> |
| B | Condensation<br><i>Kondensasi</i> | D | Reduction<br><i>Penurunan</i> |
- 8 Diagram 5 shows the action of an enzyme lactase .  
*Rajah 5 menunjukkan tindakan enzim laktase.*



Diagram 5 / Rajah 5

What does P, Q and R represent?  
*Apakah yang diwakili oleh P, Q dan R?*

	P	Q	R
A	Lactase <i>laktase</i>	Glucose <i>glukosa</i>	Fructose <i>fruktosa</i>
B	Lactase <i>laktase</i>	Glucose <i>glukosa</i>	Glucose <i>glukosa</i>
C	Lactase <i>laktase</i>	Glucose <i>glukosa</i>	Galaktose <i>galaktosa</i>
D	Lactase <i>laktase</i>	Galaktose <i>galaktosa</i>	Fructose <i>fruktosa</i>

- 9 The following statements are about the functions of enzyme R.  
*Pernyataan berikut adalah mengenai fungsi enzim R.*

The enzyme is found in yeast. It is widely used in the preparation of alcoholic drinks such as beer and wine during fermentation.

*Enzim ini terdapat dalam yis. Ia digunakan dengan meluas dalam penyediaan minuman beralkohol seperti bir dan wain semasa penapaian.*

What is enzyme R?  
*Apakah enzim R?*

- |   |                             |   |                              |
|---|-----------------------------|---|------------------------------|
| A | Amylase<br><i>Amilase</i>   | C | Zymase<br><i>Zimase</i>      |
| B | Protease<br><i>Protease</i> | D | Cellulase<br><i>Selulase</i> |
- 10 Diagram 6 shows a cell cycle.  
*Rajah 6 menunjukkan satu kitar sel.*

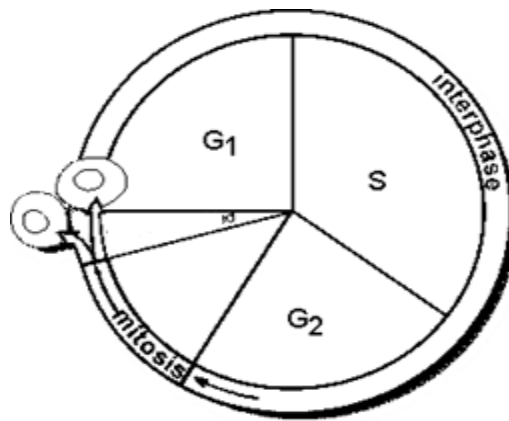


Diagram 6 / *Rajah 6*

Which of the following occurs during S?  
*Yang manakah antara berikut berlaku semasa S?*

- |   |  |
|---|--|
| A | Mitosis<br><i>Mitosis</i>                                      |
| B | Formation of new organelles<br><i>Pembentukan organel baru</i> |
| C | Accumulation of energy<br><i>Pengumpulan tenaga</i>            |
| D | Replication of DNA<br><i>Replikasi DNA</i>                     |

- 11 The diploid chromosomal number of a monkey is 42. How many chromosomes are in its liver cell?  
*Bilangan kromosom diploid bagi seekor monyet ialah 42. Berapakah bilangan kromosom dalam sel hatinya?*

A	21	C	23
B	42	D	94

- 12 Diagram 7 shows an event during cell division.  
*Rajah 7 menunjukkan suatu kejadian semasa pembahagian sel.*

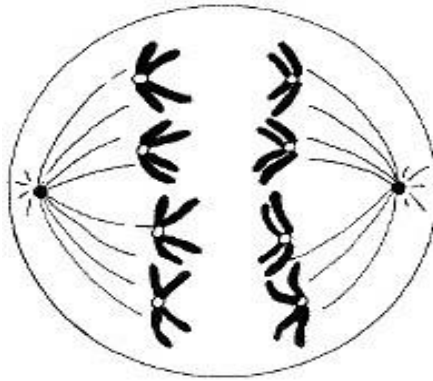


Diagram 7 / Rajah 7

Which of these statements describe the event?  
*Manakah pernyataan di bawah menerangkan tentang kejadian tersebut?*

- A Homologous chromosomes are in the opposite poles  
*Kromosom homolog berada di kutub bertentangan*
- B Homologous chromosomes lined up on the equatorial plane  
*Kromosom homolog berbaris pada satah khatulistiwa*
- C Homologous chromosomes separating to the opposite poles  
*Kromosom homolog berpisah ke kutub bertentangan*
- D The chromosomes separating to the opposite poles being pulled by the spindle fibers  
*Kromosom berpisah ke kutub bertentangan ditarik oleh gentian gelendong*

- 13 Table 1 shows the classes and quantity of food taken by a student in his daily diet.  
*Jadual 1 menunjukkan kelas makanan dan kuantiti makanan yang diambil oleh seorang pelajar dalam diet hariannya.*

Clases of food <i>Kelas makanan</i>	Quantity taken <i>Kuantiti yang diambil</i>	Recommended daily intake <i>Pengambilan harian yang disyorkan</i>
Carbohydrates <i>Karbohidrat</i>	200 g	200 g
Protein <i>Protein</i>	50 g	50 g
Vitamin C <i>Vitamin C</i>	40 mg	35 mg
Vitamin D <i>Vitamin D</i>	0.5 µg	2.5 µg
Ferum <i>Ferum</i>	10 mg	10 mg

Table 1 / Jadual 1

What is the effect of consuming the diet for a long periods of time?  
*Apakah kesan pengambilan diet tersebut dalam jangka masa yang lama?*

- |   |                           |   |                         |
|---|---------------------------|---|-------------------------|
| A | Anaemia<br><i>Anaemia</i> | C | Rickets<br><i>Riket</i> |
| B | Obesity<br><i>Obesiti</i> | D | Scurvy<br><i>Skurvi</i> |

- 14 Diagram 8 shows nutrition in an organism.  
*Rajah 8 menunjukkan nutrisi dalam suatu organisma*

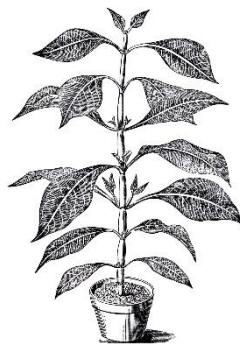


Diagram 8 / Rajah 8

What is the type of nutrition of that organism ?  
*Apakah jenis nutrisi organisma tersebut?*

- |   |                                      |   |                                      |
|---|--------------------------------------|---|--------------------------------------|
| A | Autotrophisme<br><i>Autotrofisme</i> | C | Holozoic<br><i>Holozoik</i>          |
| B | Parasitisme<br><i>Parasitisme</i>    | D | Saprophytisme<br><i>Saprofitisme</i> |

- 15 Diagram 9 shows the stage of protein digestion  
*Rajah 9 menunjukkan peringkat pencernaan protein*

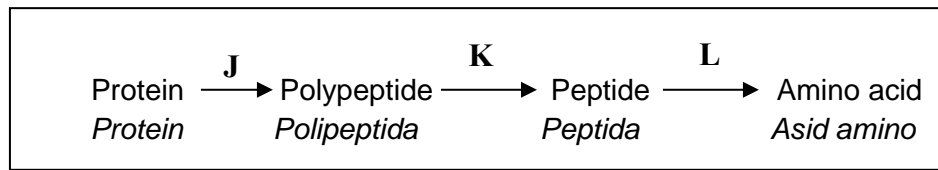


Diagram 9 / *Rajah 9*

- Which of the following enzymes in Diagram 9 represents **J**, **K** and **L**?  
*Antara enzim berikut, yang manakah dalam Rajah 9 mewakili **J**, **K** dan **L** ?*

	<b>J</b>	<b>K</b>	<b>L</b>
A	Rennin <i>Rennin</i>	Erepsin <i>Erepsin</i>	Trypsin <i>Tripsin</i>
B	Pepsin <i>Pepsin</i>	Rennin <i>Rennin</i>	Trypsin <i>Tripsin</i>
C	Trypsin <i>Tripsin</i>	Rennin <i>Rennin</i>	Pepsin <i>Pepsin</i>
D	Pepsin <i>Pepsin</i>	Trypsin <i>Tripsin</i>	Erepsin <i>Erepsin</i>

- 16 Diagram 10 shows parts of alimentary canal of human.  
*Rajah 10 menunjukkan bahagian-bahagian salur alimentari manusia.*

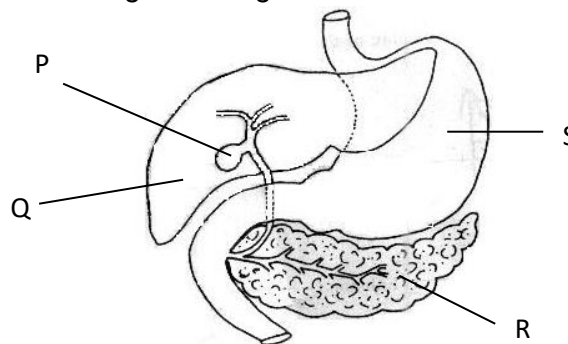


Diagram 10 / *Rajah 10*

- Which labeled organ produces the substance used to emulsify the fat in the duodenum?  
*Organ berlabel yang manakah menghasilkan bahan yang digunakan untuk mengemulsikan lemak dalam duodenum?*

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



- 17 Diagrams 11 shows the structure of a villus in the ileum.  
*Rajah 11 menunjukkan struktur vilus di dalam satu ileum*

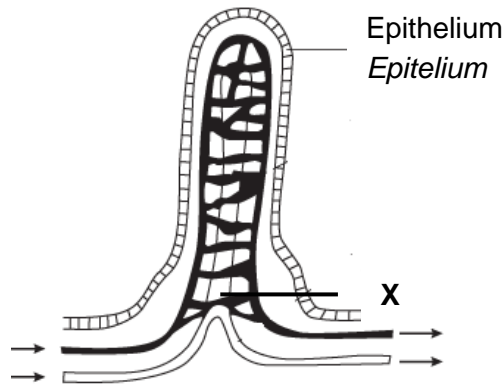


Diagram 11 / *Rajah 11*

- What is the function of the part labelled X?  
*Apakah fungsi bahagian yang berlabel X?*
- A Absorption of fatty acids and glycerol  
*Penyerapan asid lemak dan gliserol*
  - B Absorption of amino acids  
*Penyerapan asid amino*
  - C Absorption of minerals  
*Penyerapan mineral*
  - D Absorption of glucose  
*Penyerapan glukosa*
- 18 Which of the following are the products of anaerobic respiration in muscle cell?  
*Yang manakah antara berikut merupakan hasil respirasi anaerob dalam sel otot?*
- A Ethanol, carbon dioxide and energy  
*Etanol, karbon dioksida dan tenaga*
  - B Lactic acid dan carbon dioksida  
*Asid laktik dan karbon dioksida*
  - C Water vapour and oxygen  
*Wap air dan oksigen*
  - D Lactic acid and energy  
*Asid laktik dan tenaga*

- 19 Diagram 12 shows parts of a respiratory system of an insect.  
*Rajah 12 menunjukkan sebahagian daripada sistem respirasi seekor serangga.*

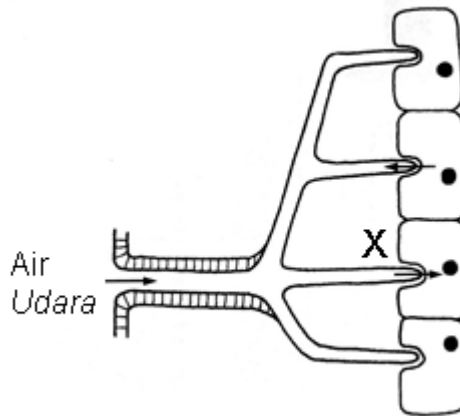


Diagram 12 / *Rajah 12*

Which process occurs at X?

*Yang manakah antara berikut proses yang berlaku di X?*

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

- 20 Diagram 13 shows a situation in human breathing  
*Rajah 13 menunjukkan situasi dalam pernafasan manusia.*

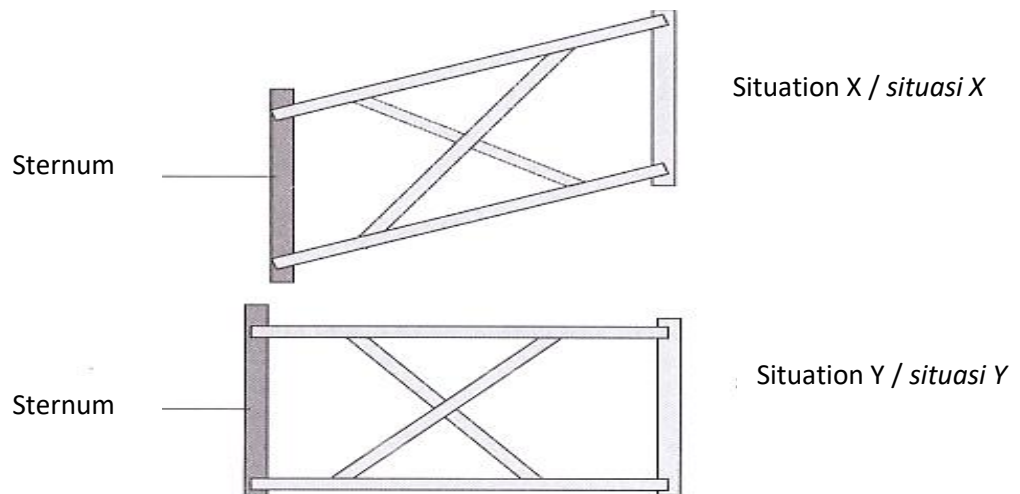


Diagram 13 / *Rajah 13*

Which of the following shows **incorrect** situation?

*Antara berikut, yang manakah menunjukkan situasi yang **tidak benar**?*

	Situation X / <i>Situasi X</i>	Situation Y / <i>Situasi Y</i>
A	The air pressure in thoracic cavity increase <i>Tekanan udara dalam rongga toraks bertambah</i>	The air pressure in thoracic cavity decrease <i>Tekanan udara dalam rongga toraks berkurang</i>
B	Diaphragm muscles relaxes <i>Otot diafragma mengendur</i>	Diaphragm muscles contract <i>Otot diafragma mengecut</i>
C	The air exhale <i>Udara keluar</i>	The air inhale <i>Udara masuk</i>
D	External Intercoastal muscles contracts <i>Otot interkosta luar mengecut</i>	External Intercoastal muscle relaxes <i>Otot interkosta luar mengendur</i>

- 21 Diagram 14 shows the process of colonization and succession in a pond.  
*Rajah 14 menunjukkan proses pengkolonian dan sesaran dalam sebuah kolam.*

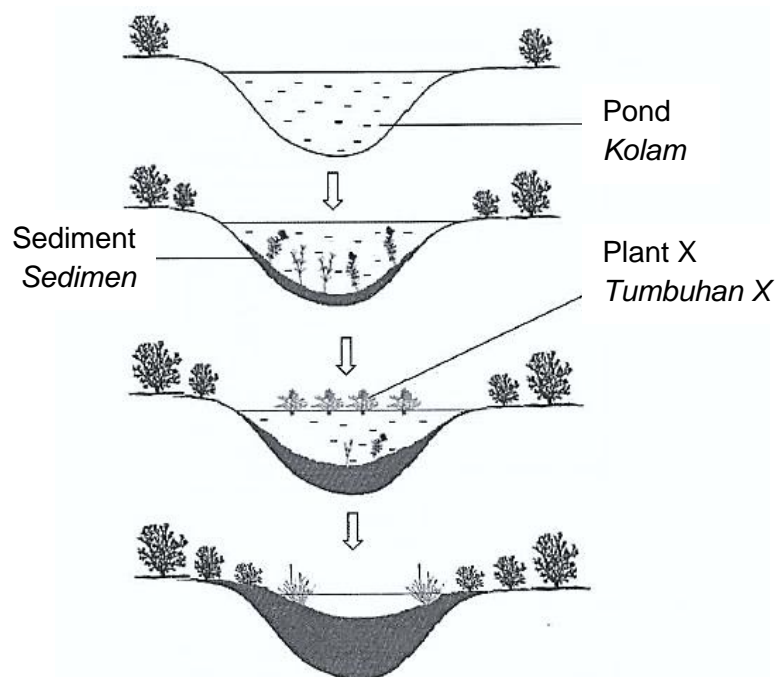


Diagram 14 / *Rajah 14*

What is the role of plant X?  
*Apakah peranan tumbuhan X?*

- |   |  |   |   |
|---|--|---|---|
| A | Pioneer species<br><i>Spesis perintis</i>  | C | Second successor<br><i>Penyesar kedua</i> |
| B | First successor<br><i>Penyesar pertama</i> | D | Third successor<br><i>Penyesar ketiga</i> |

- 22 Diagram 15 shows part of a nitrogen cycle.  
Rajah 15 menunjukkan sebahagian kitar nitrogen.

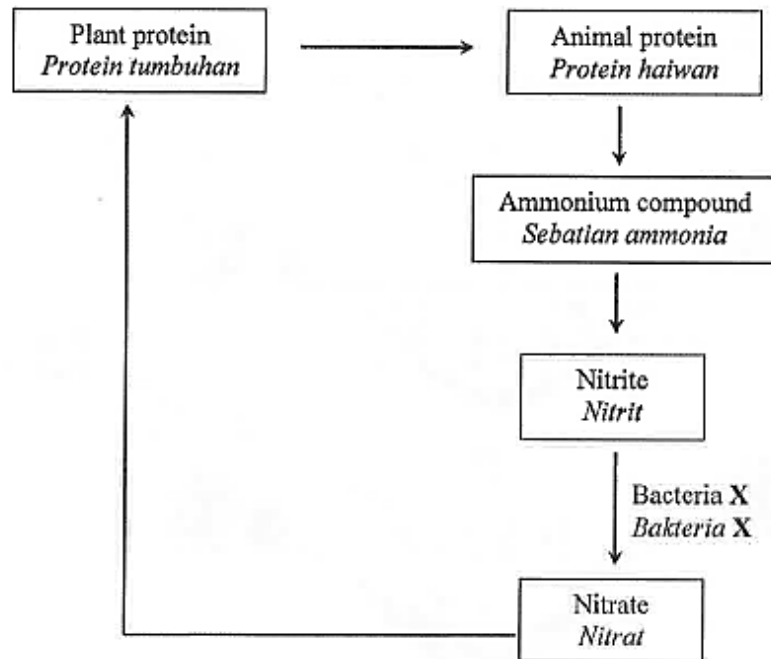


Diagram 15 / Rajah 15

What is bacteria X?

Apakah bakteria X?

- A *Nitrobacter* sp.  
*Nitrobacter* sp
- B *Rhizobium* sp  
*Rhizobium* sp
- C *Blue green algae*  
*Alga biru hijau*
- D *Nitrosomonas* sp  
*Nitrosomonas* sp
- 23 Table 2 shows results of an activity carried out to investigate the frequency of *Mimosa pudica* at a school field.  
Jadual 2 menunjukkan keputusan bagi aktiviti yang dijalankan untuk menyiasat frekuensi *Mimosa pudica* di padang sekolah

Quadrat Kuadrat	1	2	3	4	5	6	7	8	9	10
Area covered (m <sup>2</sup> ) Luas litupan (m <sup>2</sup> )	0.01	0.23	0.04	0.15	0.00	0.00	0.81	0.00	0.00	0.02

Table 2 / Jadual 2

The frequency of *Mimosa pudica* is

Frekuensi bagi *Mimosa pudica* ialah

- A 13.5%
- B 40.0%
- C 60.0%
- D 86.5%

- 24 Diagram 16 shows an interaction between two organisms.  
*Rajah 16 menunjukkan satu interaksi antara dua organisma.*

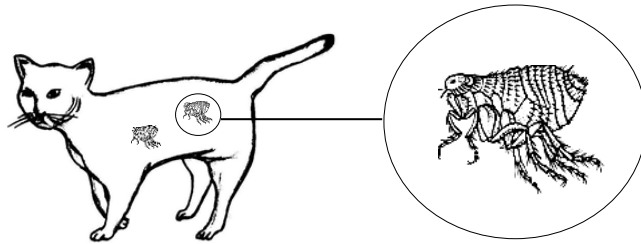


Diagram 16 / Rajah 16

What type of interaction is this?

*Apakah jenis interaksi ini?*

- |   |                                     |   |                                     |
|---|-------------------------------------|---|-------------------------------------|
| A | Commensalism<br><i>Komensalisme</i> | C | Parasitism<br><i>Parasitisme</i>    |
| B | Mutualism<br><i>Mutualisme</i>      | D | Saprophytism<br><i>Saprofitisme</i> |
- 25 Which statement explains why the milk in a pack turns sour faster if it does not keep refrigerated once opened?  
*Pernyataan manakah yang menerangkan mengapa susu dalam kotak menjadi lebih cepat masam jika ia tidak disimpan sejuk selepas dibuka?*
- A The low temperature prevent the bacteria growth  
*Suhu rendah mencegah pertumbuhan bakteria*
- B The low temperature kills the bacteria  
*Suhu rendah membunuh bakteria*
- C The enzymes in the milk are active at room temperature  
*Enzim dalam susu adalah aktif pada suhu bilik*
- D No bacteria in the refrigerator  
*Tiada bakteria di dalam peti sejuk*
- 26 Diagram 17 shows an environmental phenomenon.  
*Rajah 17 menunjukkan satu fenomena alam sekitar.*

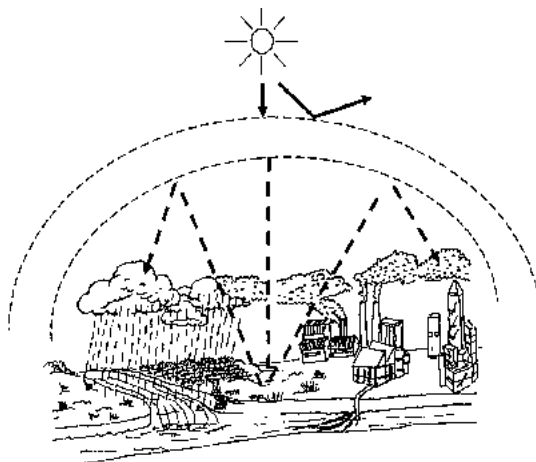


Diagram 17 / Rajah 17

What is the phenomenon?  
*Apakah fenomena tersebut?*

- A Water Pollution  
*Pencemaran Air*
- B Greenhouse Effect  
*Kesan Rumah Hijau*
- C Thermal Pollution  
*Pencemaran Terma*
- D Thinning Of Ozone Layer  
*Penipisan Lapisan Ozon*

27 The following information is about the eutrophication process.  
*Maklumat berikut adalah tentang proses eutrofikasi.*

- W The rate of bacteria reproduction increases  
*Kadar pembiakan bakteria meningkat*
- X B.O.D value increases  
*Nilai B.O.D meningkat*
- Y Excessive nutrients flow into the lake  
*Nutrien yang berlebihan mengalir ke dalam tasik*
- Z Algae grow and cover the surface of the lake  
*Alga tumbuh dan menutupi permukaan tasik*

The correct sequence of the eutrophication process is  
*Urutan yang betul bagi proses eutrofikasi ialah*

- A  $W \rightarrow Y \rightarrow Z \rightarrow X$
- B  $Y \rightarrow Z \rightarrow W \rightarrow X$
- C  $W \rightarrow Y \rightarrow X \rightarrow Z$
- D  $X \rightarrow Y \rightarrow Z \rightarrow W$

28 Diagram 18 shows a type of human blood cell.  
*Rajah 18 menunjukkan sejenis sel darah di dalam manusia.*



Diagram 18 / *Rajah 18*

Which of the following is the function of that cell?

*Antara yang berikut, yang manakah fungsi sel tersebut?*

- A Transport oxygen  
*Mengangkut oksigen*
- B Produce antibody  
*Menghasilkan antibodi*
- C Destroy pathogens by phagocytosis  
*Memusnahkan patogen secara fagositosis*
- D Involve in blood clotting  
*Terlibat dalam pembekuan darah*

- 29 Diagram 19 shows a human heart.  
*Rajah 19 menunjukkan jantung manusia.*

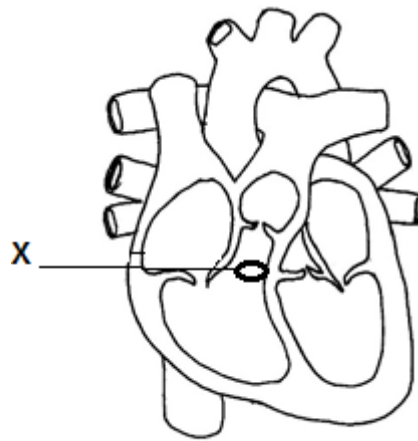


Diagram 19 / Rajah 19

What is the function of X?

*Apakah fungsi X?*

- A Initiates the heartbeat.  
*Memulakan denyutan jantung*
- B Conducts nerve impulses to the both atria and ventricles.  
*Menghantar impuls ke kedua-dua atrium dan ventrikel.*
- C Causes the contraction of the heart ventricles.  
*Menyebabkan pengecutan ventrikel jantung*
- D Causes the relaxation of the heart muscles  
*Menyebabkan pengenduran otot jantung*

- 30 Diagram 20 shows a condition of a stoma.  
*Rajah 20 menunjukkan satu keadaan stoma.*

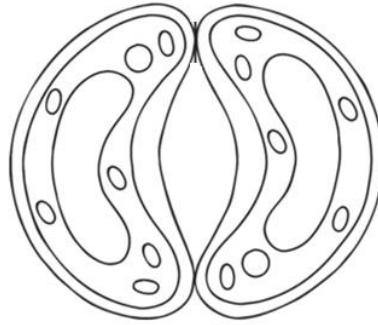


Diagram 20 / *Rajah 20*

Which of the following factors cause the condition?

*Antara faktor yang berikut, yang manakah menyebabkan keadaan tersebut?*

- |     |  |   |
|-----|--|---|
| I   | High intensity of light<br><i>Keamatan cahaya yang tinggi</i>  |   |
| II  | High relative humidity<br><i>Kelembapan relatif yang tinggi</i>  |   |
| III | High temperature of the surroundings<br><i>Suhu persekitaran yang tinggi</i>                           |   |
| IV  | High concentration of oxygen in the atmosphere<br><i>Kepekatan oksigen yang tinggi dalam atmosfera</i> |   |
| A   | I and II only<br><i>I dan II sahaja</i>  | C II and IV only<br><i>II dan IV sahaja</i>   |
| B   | I and III only<br><i>I dan III sahaja</i>  | D III and IV only<br><i>III dan IV sahaja</i> |

- 31 The following statements are the characteristics of blood vessel in the human body.  
*Pernyataan berikut adalah ciri-ciri suatu salur darah dalam badan manusia.*

- |  |
|--|
| <ul style="list-style-type: none"><li>• Transport blood to heart<br/><i>Mengangkut darah ke jantung</i></li><li>• Thin muscular wall<br/><i>Dinding berotot nipis</i></li><li>• Has valve<br/><i>Mempunyai injap</i></li></ul> |
|--|

What is the blood vessel?  
*Apakah salur darah itu?*

- |                           |   |
|---------------------------|---|
| A Artery<br><i>Arteri</i> | C Pulmonary artery<br><i>Arteri pulmonary</i> |
| B Vein<br><i>Vena</i>     | D Capillary<br><i>Kapilari</i>                |



- 32 Diagram 21 shows a graph of level of antibodies against time.  
*Rajah 21 menunjukkan graf aras antibodi melawan masa.*

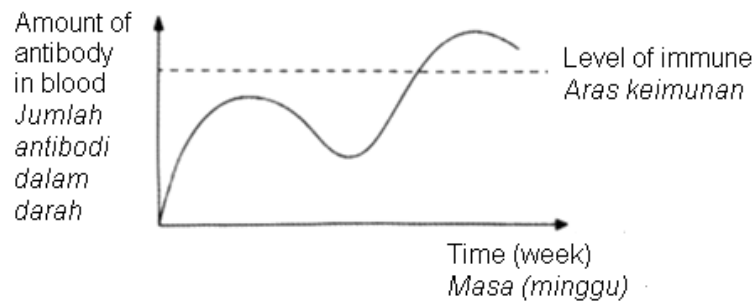


Diagram 21/ *Rajah 21*

What is the type of immunity for the graph shown above?  
*Apakah jenis keimunan bagi graf yang ditunjukkan di atas?*

- A Natural active immunity  
*Keimunan aktif semula jadi*
  - B Artificial active immunity  
*Keimunan aktif buatan*
  - C Artificial passive immunity  
*Keimunan pasif buatan*
  - D Natural passive immunity  
*Keimunan pasif semula jadi*
- 33 Diagram 22 shows the cross section of a dicotyledonous stem.  
*Rajah 22 menunjukkan keratan rentas batang tumbuhan dikotiledon.*

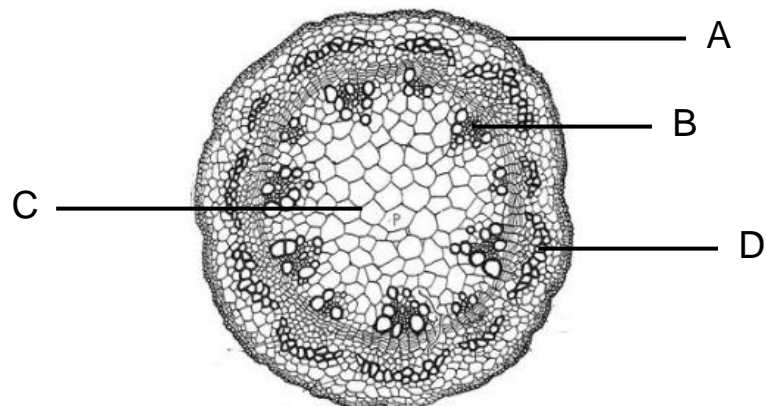
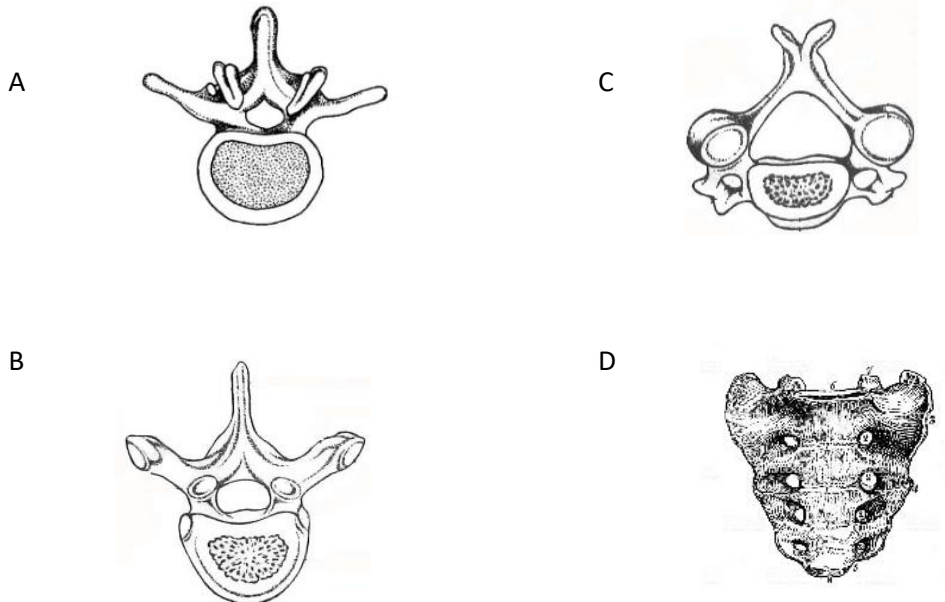


Diagram 22 / *Rajah 22*

Which structure A, B, C or D transports water?  
*Bahagian manakah, A, B, C atau D mengangkut air?*

- 34 Which of the following shows vertebra located at neck?  
 Antara berikut, yang manakah menunjukkan vertebra yang terletak pada leher?



- 35 Diagram 23 shows the fins of a fish.  
 Rajah 23 menunjukkan sirip pada seekor ikan.

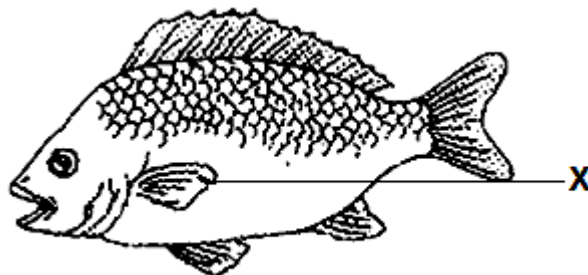


Diagram 23 / Rajah 23

What is a possibility will happen if X damage?  
 Apakah kemungkinan akan berlaku sekiranya X rosak?

- A Fish cannot change its direction  
 Ikan tidak dapat menukar arah
- B The movement become slower  
 Pergerakan ikan perlahan
- C Water resistant cannot be overcome  
 Rintangan air tidak dapat diatasi
- D Fish rolling  
 Ikan bergolek

- 36 Diagram 24 shows a synapse at the nerve ending.  
*Rajah 24 menunjukkan sinaps pada hujung saraf.*

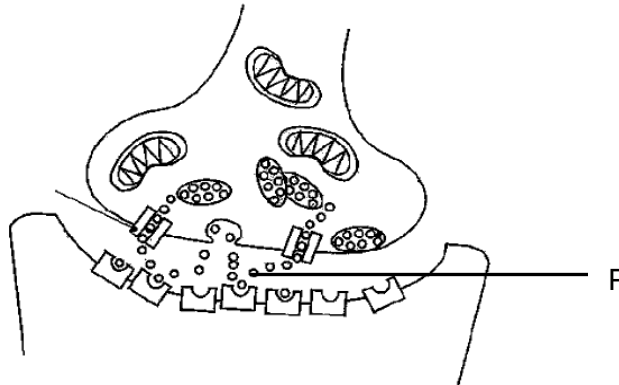


Diagram 24 / *Rajah 24*

What is substance P?

*Apakah bahan P?*

- |   |                                      |   |                                 |
|---|--------------------------------------|---|---------------------------------|
| A | Oxytocin<br><i>Oksitoksin</i>        | C | Prolactin<br><i>Prolaktin</i>   |
| B | Acetylcholine<br><i>Asetilkolina</i> | D | Adrenaline<br><i>Adrenalina</i> |

- 37 Diagram 25 shows the shoot of a plant grow towards light?  
*Rajah 25 menunjukkan pucuk tumbuhan tumbuh ke arah cahaya?*

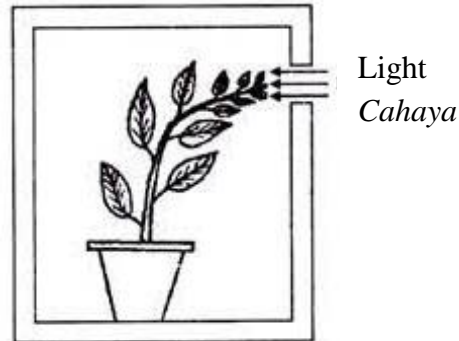


Diagram 25 / *Rajah 25*

What is the cause of the reaction?

*Apakah yang menyebabkan tindak balas tersebut?*

- |   |  |
|---|--|
| A | The shoot needs to grow longer to avoid competition for light<br><i>Pucuk perlu tumbuh lebih panjang untuk mengelakkan persaingan mendapat cahaya.</i> |
| B | The shoot needs light for photosynthesis<br><i>Pucuk memerlukan cahaya untuk berfotosintesis</i>   |
| C | The cells shaded from light elongate faster<br><i>Sel-sel terlindung dari cahaya memanjang lebih cepat.</i>  |
| D | The concentration of auxin is higher in cells exposed to light<br><i>Kepekatan auksin lebih tinggi dalam sel yang terdedah kepada cahaya</i>           |

- 38 A man had an accident. The accident caused injury to the brain and affect his reading ability.  
Which part of the brain is affected?

*Seorang lelaki mengalami kemalangan. Kemalangan itu menyebabkan kecederaan pada otak dan menjejaskan kebolehan membacanya.*

*Bahagian otak manakah yang terjejas?*

- |   |                        |   |                                      |
|---|------------------------|---|--------------------------------------|
| A | Cerebrum<br>Serebrum   | C | Hypothalamus<br>Hipotalamus          |
| B | Cerebelum<br>Serebelum | D | Medula oblongata<br>Medula oblongata |

- 39 The following are symptoms caused by excessive of certain hormone in an adult.  
*Berikut adalah simptom-simptom yang diakibatkan oleh berlebihan satu hormon dalam seorang dewasa.*

- Rate of heartbeat is high  
*Kadar denyutan jantung yang tinggi*
- High metabolisme rate  
*Kadar metabolise yang tinggi*
- Weight loss  
*Berat badan merosot*

Which hormone caused the symptoms ?

*Hormon manakah yang menyebabkan simptom-simptom tersebut?*

- |   |                          |   |                                      |
|---|--------------------------|---|--------------------------------------|
| A | Adrenaline<br>Adrenalina | C | Thyroxine<br>Tiroksina               |
| B | Insulin<br>Insulin       | D | Growth Hormone<br>Hormon pertumbuhan |

- 40 Diagram 26 shows the process of oogenesis that occurred at ovary.  
*Rajah 26 menunjukkan proses oogenesis yang berlaku pada ovari.*

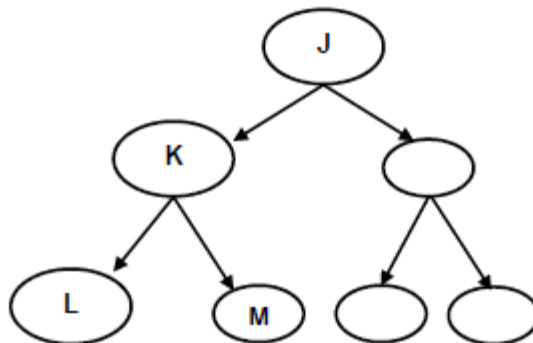


Diagram 26 / Rajah 26

What are the ploidy number represented by J, K, L and M?

Apakah nombor ploidi yang diwakili oleh J, K, L and M?

	J	K	L	M
A	2n	2n	n	n
B	2n	2n	2n	n
C	2n	n	n	n
D	n	n	n	n

- 41 Diagram 27 shows part of the female reproductive system.

Rajah 27 menunjukkan bahagian pada sistem pembiakan perempuan.

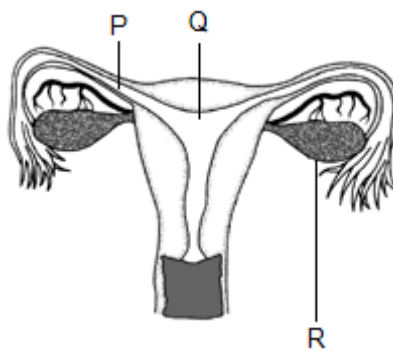


Diagram 27 / Rajah 27

Where does fertilization, implantation and ovulation occur?

Di manakah persenyawaan, penempelan dan pengovuan berlaku?

	Fertilisation <i>Persenyawaan</i>	Implantation <i>Penempelan</i>	Ovulation <i>Ovulasi</i>
A	P	Q	R
B	Q	P	R
C	R	Q	P
D	P	R	Q

- 42 Diagram shows germinating of pollen tube.

Rajah menunjukkan percambahan tiub debunga.

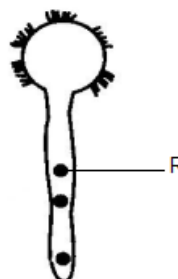


Diagram 28 / Rajah 28

From what structure R is formed ?

Dari manakah struktur R berasal?

- |   |                                       |   |                                   |
|---|---------------------------------------|---|-----------------------------------|
| A | Male nucleus<br>nukleus jantan        | C | Tube nucleus<br>Nukleus tiub      |
| B | Generative nucleus<br>Nukleus penjana | D | Pollen nucleus<br>Nukleus debunga |

43 Diagram 29 shows a growth curve of grasshopper.

Rajah 29 menunjukkan lengkung pertumbuhan seekor belalang.

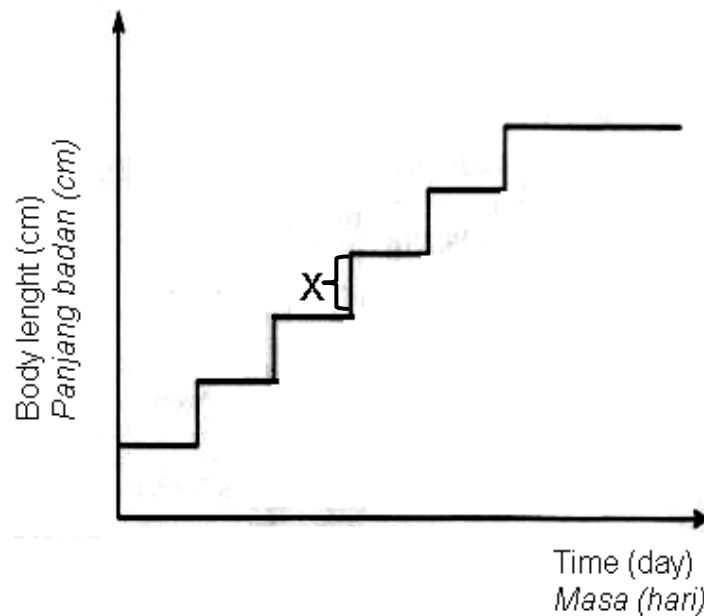


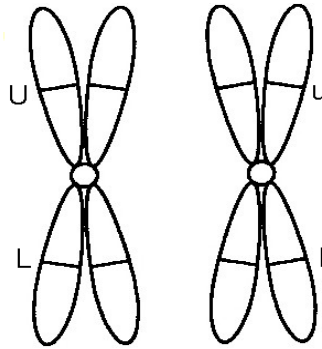
Diagram 29 / Rajah 29

What happen during stage X?

Apakah yang berlaku semasa peringkat X?

- |     |  |   |                          |
|-----|--|---|--------------------------|
| I   | Increase in body length<br>Penambahan panjang badan          |   |                          |
| II  | No increase in body length<br>Tiada penambahan panjang badan |   |                          |
| III | Absorb air<br>Menyerap udara                                 |   |                          |
| IV  | Absorb water<br>Menyerap air                                 |   |                          |
| A   | I and II<br>I dan II   | C | II and IV<br>II dan IV   |
| B   | I and III<br>I dan III                                       | D | III and IV<br>III dan IV |

44 Diagram 30 shows a pair of homologous chromosomes in a somatic cell of the plant at the prophase I .  
*Rajah 30 menunjukkan sepasang kromosom homolog dalam sel soma suatu tumbuhan pada peringkat profasa I*

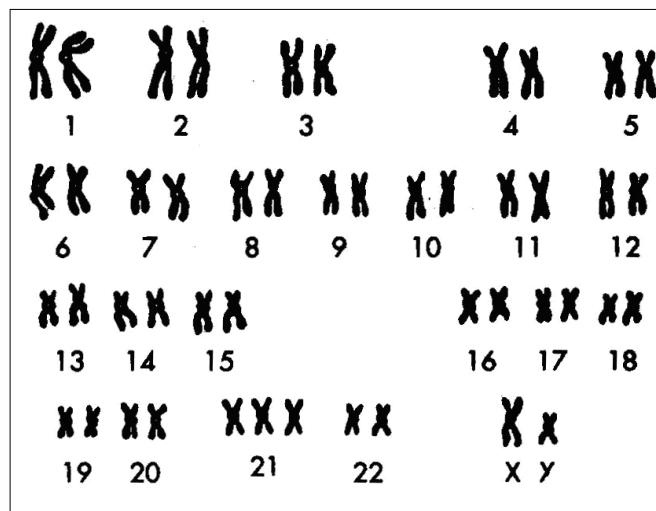
Diagram 30 / *Rajah 30*

What is the genotype of the cell.  
*Apakah genotip sel tersebut?*

- 45      A      UuLI                                      C      UILu  
           B      ULul                                      D      LUlu  
 Faridah who is a carrier for colour blindness married to Ramli, a normal colour vision.  
 What is the probability that their son is a colour blind?

Faridah adalah pembawa bagi buta warna berkahwin dengan Ramli yang mempunyai penglihatan warna normal. Apakah kemungkinan anak lelaki mereka adalah buta warna ?

- 46 Diagram 31 shows the karyotype of an individual.  
Rajah 31 menunjukkan kariotip seseorang individu.

Diagram 31 / *Rajah 31*

Which of the following has the karyotype shown?

*Antara berikut yang manakah mempunyai kariotip seperti yang ditunjukkan?*

- A Female with slanted eyes, broad face, short neck and broad protruded tongue  
*Perempuan bermata sepet, muka lebar, leher pendek dan lidah lebar serta terjelir*
- B Male with slanted eyes broad face, short neck and broad protruded tongue  
*Lelaki bermata sepet, muka lebar, leher pendek dan lidah lebar serta terjelir*
- C Female with short neck, mentally retarded and sterile  
*Perempuan berleher pendek, terncat akal dan mandul*
- D Male with short neck, mentally retarded and sterile  
*Lelaki berleher pendek, terencat akal dan mandul*

- 47 Diagram 32 shows a parent with four children who having the following blood group.  
*Rajah 32 menunjukkan ibu bapa yang mempunyai empat orang anak dengan kumpulan darah seperti berikut.*

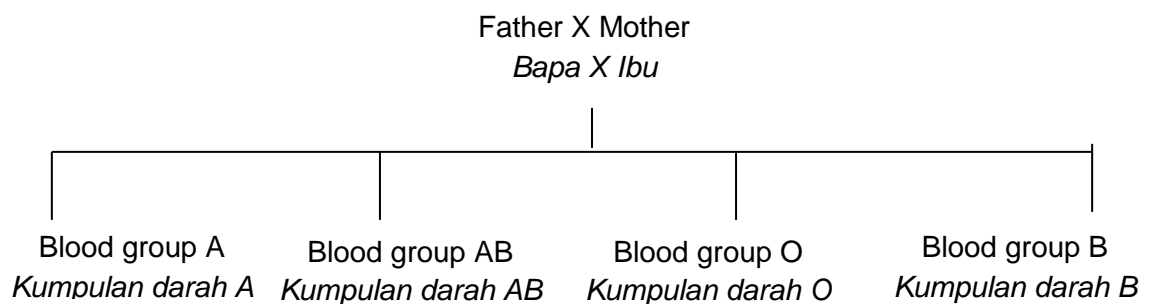


Diagram 32 / Rajah 32

If the father has blood group A, which blood group would the mother has?

*Jika bapa mempunyai kumpulan darah A, apakah kumpulan darah yang sepatutnya dimiliki oleh ibu?*

- |   |  |   |  |
|---|--|---|--|
| A | Blood group A<br><i>Kumpulan darah A</i>   | C | Blood group O<br><i>Kumpulan darah O</i> |
| B | Blood group AB<br><i>Kumpulan darah AB</i> | D | Blood group B<br><i>Kumpulan darah B</i> |

- 48 What are the applications of DNA fingerprinting?

*Apakah aplikasi cap jari DNA ?*

- I To produce genetically modified organisms  
*Untuk menghasilkan organisma ubahsuaian genetik*
- II To produce insulin  
*Untuk menghasilkan insulin*



- III To help solve criminal cases  
*Untuk menyelesaikan kes jenayah*
- IV To help settle paternity disputes  
*Untuk mengesahkan ibubapa biologi*
- A I and II  
*I dan II*
- B I and III  
*I dan III*
- C II and III  
*II dan III*
- D III and IV  
*III dan IV*

- 49 Two orchid plants P and Q are produced by tissue culture.  
The following table shows two different characteristics for both plants.

*Dua pokok orkid P dan Q dihasilkan melalui kultur tisu.*

*Jadual berikut menunjukkan dua ciri berlainan bagi kedua-dua pokok tersebut.*

Pokok <i>Plant</i>	Characteristics / <i>Ciri-ciri</i>	
	Colour of flower <i>Warna bunga</i>	Average length of leaves (cm) <i>Purata panjang daun (cm)</i>
P	Red <i>Merah</i>	23
Q	Red <i>Merah</i>	17

Based on the information given, what is the factor that affects the characteristic?

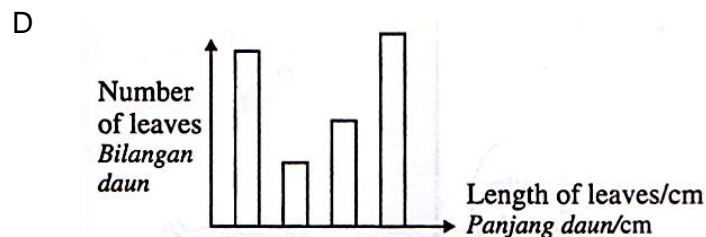
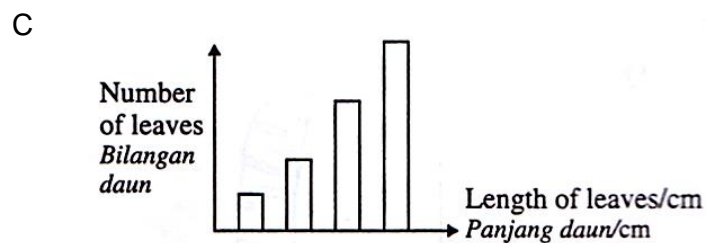
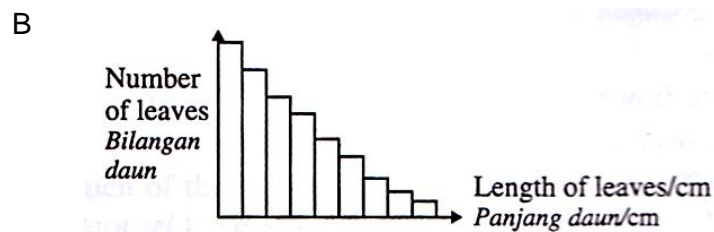
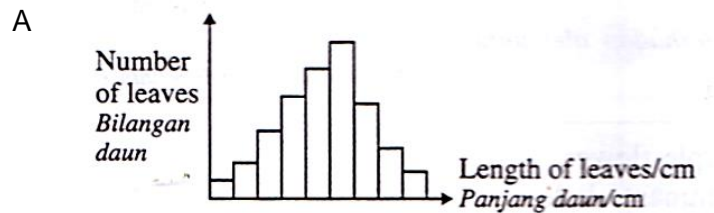
*Berdasarkan maklumat yang diberi, apakah faktor yang mempengaruhi ciri-ciri tersebut?*

- A Both characteristics are affected by genetic factor  
*Kedua-dua ciri dipengaruhi oleh faktor genetik*
- B Both characteristics are affected by environmental factor  
*Kedua-dua ciri dipengaruhi oleh faktor alam sekitar*
- C The colour of flower is affected by genetic factor but the length of leaves is affected by environmental factor  
*Warna bunga dipengaruhi oleh faktor genetik tetapi panjang daun dipengaruhi oleh faktor alam sekitar*
- D The colour of flower is affected by environmental factor but the length of leaves is affected by genetic factor  
*Ciri warna bunga dipengaruhi oleh faktor genetik tetapi ciri panjang daun dipengaruhi oleh faktor alam sekitar*

The mango plant has leaves of various sizes.  
*Pokok mangga mempunyai daun-daun yang pelbagai saiz.*

Which of the following graphs represents the variation shown by the characteristic of the leaves?

*Antara graf berikut, manakah mewakili variasi yang ditunjukkan oleh ciri daun pokok tersebut?*



**END OF QUESTION PAPER**

**KERTAS SOALAN TAMAT**