

**SULIT**  
**4551/1**  
Biology  
Kertas 1  
OKT/NOV  
2009  
1¼ jam

**4551/1**



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**JABATAN PELAJARAN MELAKA**

**PEPERIKSAAN AKHIR TAHUN 2009**

**TINGKATAN 4**

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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 adalah dalam dwibahasa.
2. Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.
3. Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.

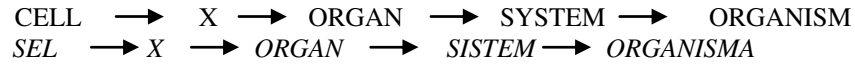
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Kertas soalan ini mengandungi **37** halaman bercetak

## INFORMATION FOR CANDIDATES

1. This question paper consists of 50 questions.
2. Answer **all** questions.
3. Answer each question by blackening the correct space on the answer sheet.
4. Blacken only **one** space for each question.
5. If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.
6. The diagrams in the questions provided are not drawn to scale unless stated.
7. You may use a non-programmable scientific calculator.

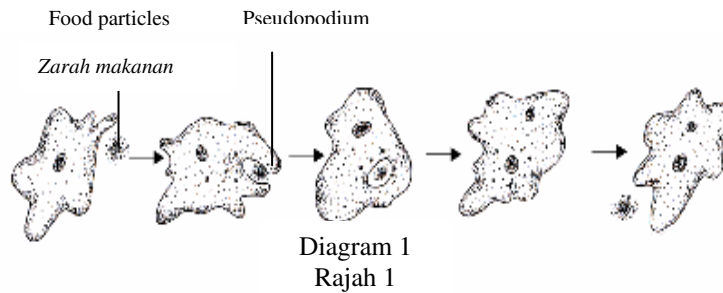
1. The statement below shows the cell organization in a multicellular organism.  
*Kenyataan di bawah menunjukkan organisasi sel dalam organisma multisel.*



Which of the following is represented by X?  
*Yang manakah antara berikut mewakili X?*

- A Cartilage  
*Rawan*
- B Stomach  
*Perut*
- C Skin  
*Kulit*
- D Bone  
*Tulang*
2. The following information refers to organelle Y  
*Maklumat berikut merujuk kepada organel Y*
- It has ribosomes attached to the membrane  
*Ia mempunyai ribosom melekat pada membran*
  - Its functions is to transport protein that are synthesized at the ribosomes  
*Ia berfungsi untuk mengangkut protein yang disintesis di ribosom*
- A Nucleus  
*Nukleus*
- B Golgi body  
*Jasad Golgi*
- C Rough endoplasmic reticulum  
*Retikulum endoplasma kasar*
- D Smooth endoplasmic reticulum  
*Retikulum endoplasma licin*

- 3 Diagram 1 shows a process carried out by an *Amoeba sp.*  
*Rajah 1 menunjukkan proses yang dijalankan oleh Amoeba sp.*



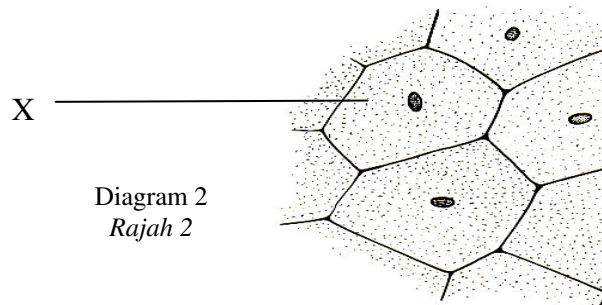
Name the process shown?  
*Namakan proses yang ditunjukkan?*

- A Binary fission  
*Belahan dedua*
- B Phagocytosis  
*Fagositosis*
- C Diffusion  
*Resapan*
- D Osmoregulation  
*Osmoregulasi*
- 4 Which of the following structure can only be found in a plant cell ?  
*Yang manakah antara berikut struktur yang hanya boleh didapati pada sel tumbuhan?*
- A Nucleus  
*Nukleus*
- B Cytoplasm  
*Sitoplasma*
- C Lysosome  
*Lisosom*
- D Chloroplast  
*Kloroplast*

5 When vegetables are cut into small pieces, the juice that is released comes from  
*Apabila sayur-sayuran dipotong kepada potongan kecil, cecair yang keluar berasal dari*

- A Chloroplast  
*kloroplast*
- B Lysosomes  
*lisosom*
- C secretory vesicles  
*Vesikel rembesan*
- D cell vacuoles  
*Sel vakoul*

6 Diagram 2 shows an animal cell.  
*Rajah 2 menunjukkan sel haiwan.*



X is a  
*X ialah*

- A cytoplasm  
*sitoplasma*
- B centriole  
*sentriol*
- C cell wall  
*dinding sel*
- D plasma membrane  
*membran plasma*

- 7 Which of the following organelles is **not correctly** matched to its function?  
*Yang manakah antara organel berikut **tidak benar** pasangan fungsinya?*
- A Lysosome-digestion of macromolecules  
*Lisosom- pencernaan makromolekul*
  - B Nucleus- control of cellular activities  
*Nukleus- mengawal aktiviti sel*
  - C Ribosome- synthesis of proteins  
*Ribosom- sintesis protein*
  - D Rough endoplasmic reticulum- synthesis lipid  
*Retikulum endoplasma kasar-sintesis lipid*
- 8 The blood glucose level is regulated by the  
*Paras glukos dalam darah dikawalatur oleh*
- I digestive system  
*sistem pencernaan*
  - II circulatory system  
*sistem peredaran*
  - III endocrine system  
*sistem endokrin*
  - IV excretory system  
*sistem perkumuhan*
- A I and II only  
*I dan II sahaja*
  - B III and IV only  
*III dan IV sahaja*
  - C I, II and III only  
*I, II dan III sahaja*
  - D II, III and IV only  
*II, III dan IV sahaja*

- 9 Which of the following pairs of tissues and functions are correct?  
 Yang manakah antara pasangan tisu dan fungsinya adalah betul?

	Tissue <i>Tisu</i>	Function <i>Fungsi</i>
I	Meristem tissue <i>Tisu meristem</i>	Cell division <i>Pembahagian sel</i>
II	Epidermal tissue <i>Tisu epidermis</i>	Control the loss of mineral salts <i>Mengawal kehilangan garam mineral</i>
III	Vascular tissue <i>Tisu vaskular</i>	Transport water and nutrient <i>Mengangkut nutrient dan air</i>
IV	Mechanical tissue <i>Tisu mekanikal</i>	Transport gases <i>Mengangkut gas</i>

- A I and III only  
*I dan III sahaja*
- B II and IV only  
*II dan IV sahaja*
- C I, II and IV only  
*I, II dan IV sahaja*
- D I, II, III and IV  
*I, II, III dan IV*
- 10 The tissue that lines the internal organs is the  
*Tisu yang melapisi organ dalaman ialah*
- A nerve cell  
*tisu saraf*
- B epithelial tissue  
*tisu epitelial*
- C connective tissue  
*tisu penyambung*
- D muscle tissue  
*tisu otot*

- 11 The movement of molecules across the plasma membrane depends on  
*Pergerakan molekul merentasi membran plasma bergantung kepada*
- I the solubility of the molecules in lipid  
*kelarutan molekul di dalam lipid*
  - II the shape of molecules  
*bentuk molekul*
  - III the polarity of the molecules  
*keketuban molekul*
  - IV the size of molecules  
*saiz molekul*
- A I and III only  
*I dan III sahaja*
- B III and IV  
*III dan IV*
- C I, III and IV  
*I, III dan IV*
- D I and II  
*I dan II*
- 12 Which of the following terms explain a process of water movement from a hypotonic solution to a hypertonic solution through a semi-permeable membrane?  
*Manakah antara istilah berikut yang menerangkan proses pergerakan air daripada larutan hipotonik kepada larutan hipertonik melalui selaput separa telap?*
- A Osmosis  
*Osmosis*
  - B Difusion  
*Resapan*
  - C Active transport  
*Pengangkutan aktif*
  - D Passive transport  
*Pengangkutan pasif*



- 13 The structure labelled X in Diagram 3 is known as a  
*Struktur berlabel X di dalam Rajah 3 adalah*

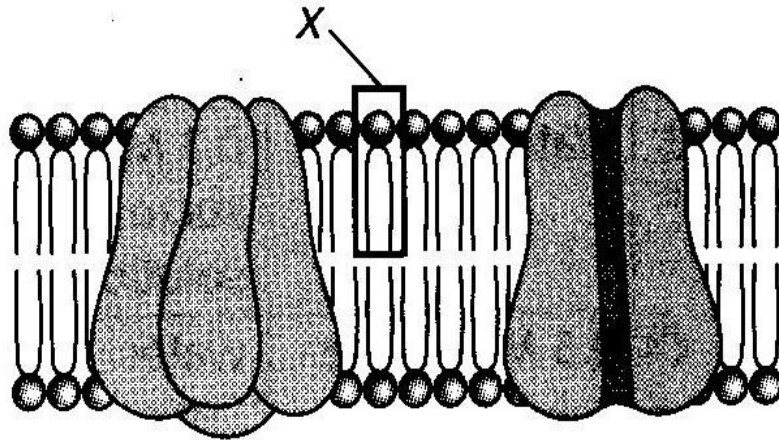


Diagram 3  
*Rajah 3*

- A cholesterol  
*kolesterol*
- B pore protein  
*protein liang*
- C phospholipid  
*fosfolipid*
- D carrier protein  
*protein pembawa*

- 14 The Figure 4 is an experiment to show the movement of water through a membrane.

*Rajah 4 adalah eksperimen yang menunjukkan pergerakan molekul merentasi membrane.*

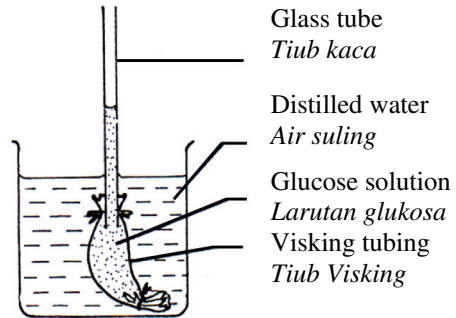


Figure 4

*Rajah 4*

At the end of the experiment, the water level in the glass tube will rise because  
*Di akhir eksperimen, paras air di dalam tiub kaca akan meningkat kerana*

- A glucose solution flowed out of the visking tubing.  
*larutan glukosa keluar daripada tiub visking.*
- B water goes into the visking tubing.  
*air masuk ke dalam tiub visking*
- C air goes into the visking tubing.  
*udara masuk ke dalam tiub visking*
- D the atmospheric pressure causes the water level to rise.  
*tekanan udara menyebabkan paras air meningkat.*

- 15 A student soaked an egg in a saturated salt solution. A few days later, he found that the egg tasted salty. Which of the following statements explain this observation?

*Seorang pelajar merendam sebiji telur di dalam larutan garam. Selepas beberapa hari didapati telur itu berasa masin. Manakah antara kenyataan berikut menerangkan pemerhatian ini?*

- I The eggshell is permeable to salt solution.  
*Kulit telur adalah telap terhadap larutan garam.*
- II Salt particles enter the egg by active transport.  
*Partikel garam memasuki telur secara pengangkutan aktif.*
- III The saturated salt solution is hypertonic to the content of the egg  
*Larutan garam tepu adalah hipertonik terhadap kandungan telur.*
- IV Salt particles can diffuse through the eggshell and plasma membrane.  
*Partikel garam boleh meresap melalui kulit telur dan plasma membrane.*
- A I and III  
*I dan III*
- B I and IV  
*I dan IV*
- C II, III and IV  
*II, III dan IV*
- D I, III and IV  
*I, III dan IV*

- 16 The figure 3 shows a plant cell that has been immersed into 30% sucrose solution.

*Rajah 3 menunjukkan sel tumbuhan yang telah direndam ke dalam larutan sukrosa 30%.*

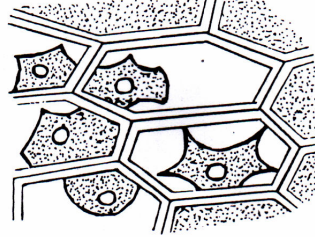


Figure 5  
*Rajah 5*

Which of the following shows the changes of the cell?  
*Manakah antara yang berikut menunjukkan perubahan pada sel?*

- I The cell is plasmolysed  
*Sel mengalami plasmolisis*
  - II The plasma membrane is detached from the cell wall  
*Membran plasma tertrik daripada dinding sel*
  - III The vacuole in the cell is filled with 30% sucrose solution.  
*Ruang vacuol di dalam sel dipenuhi dengan larutan sukrosa 30%*
  - IV The space between the plasma membrane and the cell wall is filled with 30% sucrose solution.  
*Ruang diantara membran plasma dan dinding se dipenuhi oleh larutan sucrose 30%*
- A I and II only  
*I dan II sahaja*
  - B II and IV only  
*II dan IV sahaja*
  - C I, II and IV only  
*I, II dan IV sahaja*
  - D II, III and IV only  
*II, III dan IV sahaja*

- 17 Diagram 6 shows a type of fresh water unicellular organism.  
*Rajah 6 menunjukkan sejenis organisma unisel air tawar.*

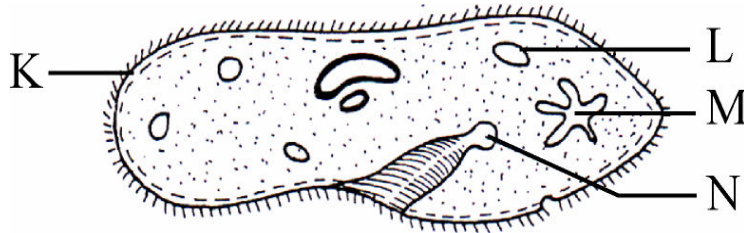


Diagram 6  
*Rajah 6*

What structure will help to maintain the osmotic concentration of the body?

*Apakah struktur yang akan membantu ia mengekalkan kepekatan osmotik tubuhnya?*

- A K
- B L
- C M
- D N

18

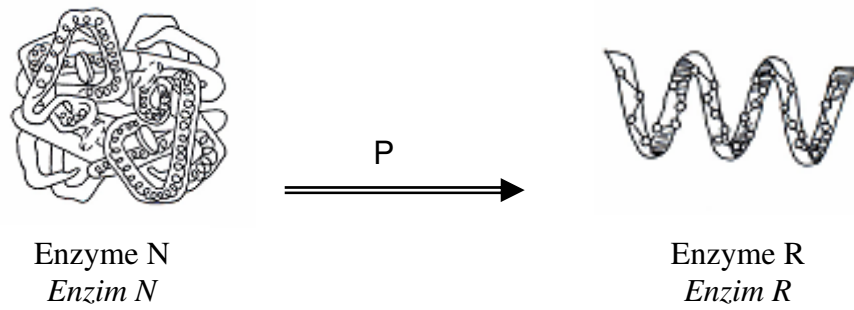


Diagram 7  
Rajah 7

Diagram 7 shows the structure of enzyme N change to structure R when being heat above  $60^{\circ}\text{C}$  through the process P. Name P.

*Rajah 7 menunjukkan struktur Enzim N yang berubah kepada struktur R apabila dipanaskan melebihi  $60^{\circ}\text{C}$  melalui proses P. Namakan P.*

- A Hydrolysis  
*Hidrolisis*
- B Deamination  
*Pendeaminasi*
- C Denaturation  
*Penyahalsian*
- D Condensation  
*Kondensasi*

- 19 Figure 8 shows an illustration to describe the ‘lock and key’ hypothesis in the enzyme reaction.

*Rajah 8 menunjukkan satu ilustrasi untuk menggambarkan hipotesis “kunci dan mangga” dalam tindak balas enzim.*

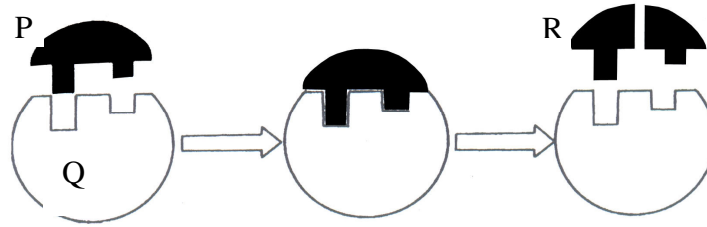


Diagram 8  
*Rajah 8*

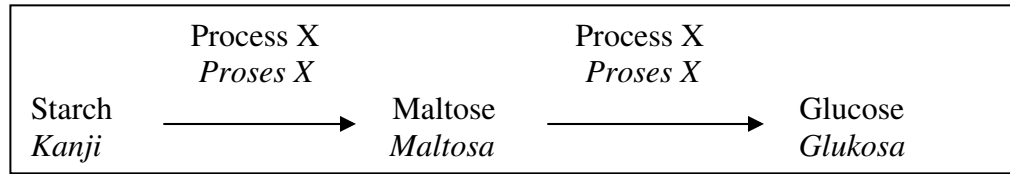
Which of the followings to represent P, Q and R  
*Antara berikut yang manakah mewakili P, Q dan R*

	P	Q	R
A	Substrate <i>Substrat</i>	Enzyme <i>Enzim</i>	Product <i>Hasil</i>
B	Product <i>Hasil</i>	Substrate <i>Substrat</i>	Enzyme <i>Enzim</i>
C	Enzyme <i>Enzim</i>	Product <i>Hasil</i>	Enzyme <i>Enzim</i>
D	Product <i>Hasil</i>	Enzyme <i>Enzim</i>	Substrate <i>Substrat</i>

- 20 Which statement is **true** about the function of lipid in the cell?  
*Pernyataan manakah yang benar tentang fungsi lipid dalam sel?*

- A It gives a structural support to the cell wall.  
*Ia memberi struktur sokongan kepada dinding sel*
- B It plays a major role in the structure of the cell membrane  
*Ia memainkan peranan utama dalam struktur membran sel*
- C It forms a hormone which controls the growth and metabolism.  
*Ia membentuk hormon yang mengawal pembesaran dan metabolisma.*
- D It contains genetic information of the cell.  
*Ia mengandungi maklumat genetik sel.*

- 21 The following information shows starch molecules undergoing process X.  
Maklumat berikut menunjukkan molekul kanji melalui proses X.



What is process X?  
*Apakah proses X?*

- A Photosynthesis  
*Fotosintesis*
- B Polymerization  
*Pempolimeran*
- C Condensatoin  
*Kondensasi*
- D Hydrolysis  
*Hidrolisis*
- 22 The diploid chromosomal number of a cat is 38.  
If one of the homologous chromosome pairs does not separate during meiosis I, how many chromosomes can be found in the gametes?
- Nombor kromosom diploid bagi seekor kucing ialah 38.  
Jika salah satu pasangan kromosom homolog tidak terpisah semasa meiosis I, berapakah bilangan kromosom yang mungkin didapati pada gamet?*
- A 18
- B 19
- C 37
- D 38



- 23 Diagram 9 shows an animal cell during anaphase I of meiosis.  
*Rajah 9 menunjukkan sel haiwan semasa anafasa I dalam meiosis.*

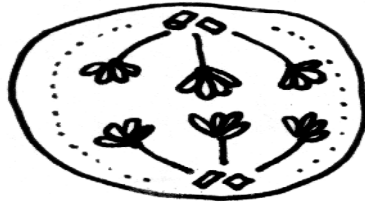


Diagram 9  
*Rajah 9*

How many chromosomes are there in the parent cell of this animal cell?  
*Berapakah bilangan kromosom dalam sel induk bagi sel haiwan ini?*

- A 3  
 B 6  
 C 12  
 D 24
- 24 Which of these substrates is not match correctly with its uses?  
*Manakah antara substrat berikut tidak dipadankan kegunaannya dengan betul?*

	Enzymes <i>Enzim</i>	Uses <i>Kegunaan</i>
A.	Lactase <i>Laktase</i>	Solidifies milk proteins <i>Membekukan protein lemak</i>
B.	Lipase <i>Lipase</i>	Ripen cheese <i>Mematangkan keju</i>
C.	Glucose isomerase <i>Glukosa isomerase</i>	Converts glucose to fructose <i>Menukar glukosa ke fruktosa</i>
D.	Protease <i>Protease</i>	Removes the skin of fish <i>Menyingkir kulit ikan</i>

25 Diagram 10 shows the effect of the activity of two enzymes P and Q in humans.

*Rajah 10 menunjukkan kesan pH ke atas activity of two enzymes P dan Q dalam manusia.*

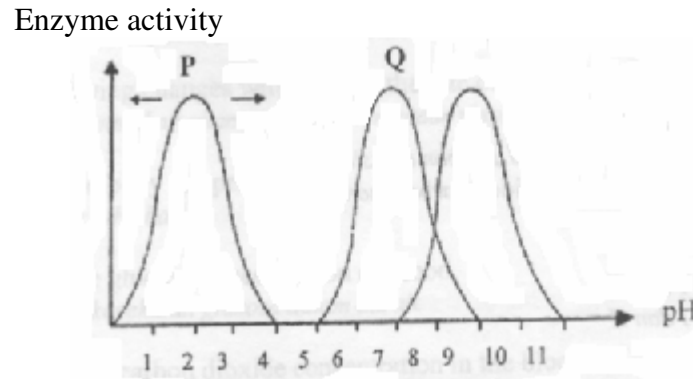


Diagram 10  
*Rajah 10*

Which of the following are the substrates for the two enzymes?

*Antara berikut yang manakah merupakan substrat untuk dua jenis enzim ini?*

	P	Q
A.	Lipids <i>Lipid</i>	Cooked starch <i>Kanji masak</i>
B.	Cooked starch <i>Kanji masak</i>	Proteins <i>Protein</i>
C.	Lipids <i>Lipid</i>	Protein <i>Protein</i>
D.	Proteins <i>Protein</i>	Cooked starch <i>Kanji masak</i>

26

Table 1 shows the nutrient content in 100g of various types of food.  
*Jadual 1 menunjukkan kandungan nutrient dalam 100g bagi beberapa jenis makanan.*

Food <i>Makanan</i>	Nutrien content <i>Kandungan nutrien</i>				
	Protein/g <i>Protein/g</i>	Lipid/g <i>Lipid/g</i>	Carbohydrate/g <i>Karbohidrat/g</i>	Calcium/mg <i>Kalsium/mg</i>	Iron/g <i>Iron/g</i>
White bread <i>Roti putih</i>	8.0	1.7	54.3	100	1.7
Apple <i>Epal</i>	0.3	0	12.0	4	0.3
Butter <i>Mentega</i>	0.5	82.5	0	15	0.2
Rice <i>Nasi</i>	6.2	1.0	86.8	4	0.4
Eggs <i>Telur</i>	12.3	10.9	0	56	2.1

Table 1  
*Jadual 1*

A student bled and fractured his bone during school sport practice.  
 Based on Table 1, which types of food are suitable for student for fast recovery?

*Seorang murid mengalami luka dan patah tulang semasa menjalani latihan sukan.*

*Berdasarkan Jadual 1, jenis makanan yang manakah sesuai diambil alih oleh murid itu supaya cepat sembuh?*

- A Apple, rice, butter  
*Epal, nasi, mentega*
- B White bread, eggs, rice  
*Roti putih, telur, nasi*
- C Eggs, apple, butter  
*Telur, epal, mentega*
- D White bread, butter, apple  
*Roti putih, mentega, epal*

- 27 The following data is the result of an experiment to determine the energy value of a peanut.

*Data berikut merupakan keputusan suatu eksperimen untuk menentukan nilai tenaga bagi kacang tanah.*

Mass of peanut <i>Jisim kacang tanah</i>	0.5g
Mass of water <i>Jisim air</i>	20g
Initial temperature of water <i>Suhu awal air</i>	25°C
Final temperature of water <i>Suhu akhir air</i>	45°C

The specific heat capacity of water is  $4.2\text{Jg}^{-1}\text{C}^{-1}$ . Calculate the energy value of the peanut.

*Muatan haba tentu air ialah  $4.2\text{Jg}^{-1}\text{C}^{-1}$ . Hitung nilai tenaga bagi kacang tanah.*

- A  $1\,680\text{Jg}^{-1}$
- B  $3\,360\text{Jg}^{-1}$
- C  $7\,560\text{Jg}^{-1}$
- D  $11\,760\text{Jg}^{-1}$

- 28 In the dark, closure of the stoma is due to  
*Di dalam gelap, penutupan stoma berlaku disebabkan oleh*
- I The guard cell does not carry out photosynthesis  
*Sel pengawal tidak dapat menjalankan fotosintesis*
  - II Concentration of cell sap reduces  
*Kepekatan sap sel berkurang*
  - III The guard cell becomes flaccid  
*Sel pengawal menjadi flasid*
  - IV Rate of transpiration decreases  
*Kadar transpirasi berkurang*
- A I and III only  
*I dan III sahaja*
- B II and IV only  
*II dan IV sahaja*
- C I, II and III only  
*I, II dan III sahaja*
- D I, II, III and IV  
*I, II, III dan IV*
- 29 Organisms which are not able to synthesize their own food are  
*Organisma yang tidak boleh mensintesis makanan sendiri adalah*
- A autotrophs  
*autotrof*
  - B heterotrophs  
*heterotrof*
  - C parasites  
*parasit*
  - D pathogens  
*patogen*

- 30 Which of the following enzymes are produced by the pancreas?  
*Enzim yang manakah dihasilkan oleh pankreas?*
- I Lipase  
*Lipase*
- II Amylase  
*Amilase*
- III Trypsin  
*Tripsin*
- IV Erepsin  
*Erepsin*
- A I and III only  
*I dan III sahaja*
- B II and IV only  
*II dan IV sahaja*
- C I, II and III only  
*I, II dan III sahaja*
- D I, II, III and IV  
*I, II, III dan IV*
- 31 Which of the following is the product of aerobic and anaerobic respiration in muscles?  
*Yang manakah antara berikut adalah hasil respirasi aerobik dan anaerobik dalam otot?*

	<b>Anaerobic respiration</b> <i>Respirasi anaerobik</i>	<b>Aerobic respiration</b> <i>Respirasi aerobik</i>
A	Lactic acid <i>Asid laktik</i>	Ethanol <i>Etanol</i>
B	Carbon dioxide and water <i>Karbon dioksida dan air</i>	Ethanol <i>Etanol</i>
C	Lactic acid <i>Asid laktik</i>	Carbon dioxide and water <i>Karbon dioksida dan air</i>
D	Carbon dioxide <i>Karbon dioksida</i>	Ethanol <i>Etanol</i>

32

Diagram 11 shows the arrangement of apparatus to measure the quantity of gas in the air.  
*Rajah 11 menunjukkan susunan radas untuk mengukur kuantiti gas dalam sampel udara.*

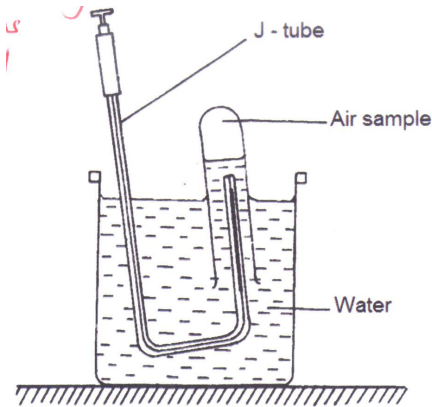


Diagram 11

*Rajah 11*

Initial length of bubble gas .....	10.00 cm
<i>Panjang asal gelembung udara .....</i>	<i>10.00 cm</i>
Length of bubbles gas + potassium hydroxide solution .....	9.40 cm
<i>Panjang gelembung udara + larutan kalium hidroksida .....</i>	<i>9.40cm</i>
Length of bubble gas + potassium pyrogalate solution .....	8.00 cm
<i>Panjang gelembung udara + larutan kalium progalat .....</i>	<i>8.00 cm</i>

Percentage of oxygen in the air sample is

*Peratus kandungan oksigen dalam sampel udara adalah*

- A 6%
- B 10%
- C 14%
- D 16%

- 33 Diagram 12 shows an experiment to investigate yeast activity.  
*Raja 12 menunjukkan satu eksperimen untuk menyiasat aktiviti yis.*

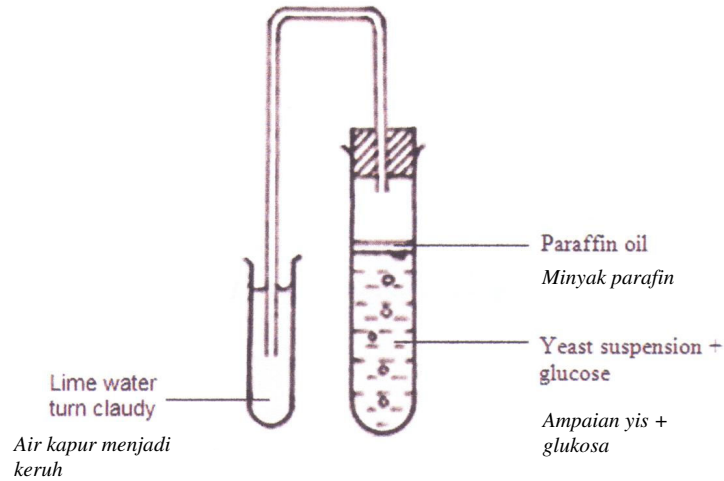


Diagram 12

*Rajah 12*

The yeast is suspended in a glucose solution. Which of the following occurs during the experiment?

*Rajah 2 menunjukkan ujikaji untuk menyiasat aktiviti yis. Yang manakah antara berikut berlaku semasa eksperimen?*

- A Carbon dioxide is produced  
*Karbon doiksida dihasilkan*
- B Anaerobic respiration takes place  
*Respirasi anaerobik berlaku*
- C Complete breakdown of glucose  
*Pemecahan molekul glukosa*
- D Lactic acid will produce  
*Asid laktik dihasilkan*



- 34 Diagram 13 shows the structure of respiration system of certain organism.  
*Diagram 13 menunjukkan struktur bagi sistem respirasi suatu organisma*

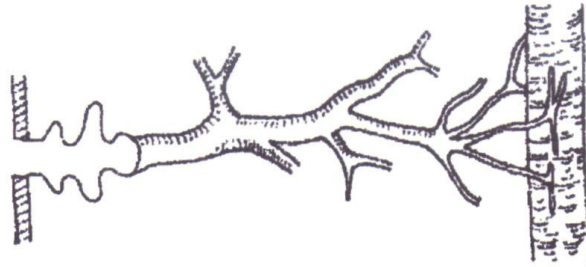


Diagram 13

*Rajah 13*

Which organism has this structure?.

*Organisma yang manakah mempunyai sturuktur itu?*

- A Frog  
*Katak*
- B Grasshopper  
*Belalang*
- C Fish  
*Ikan*
- D Crocodile  
*Buaya*

- 35 Diagram 14 shows human respiratory system  
*Rajah 14 menunjukkan system respirasi manusia.*

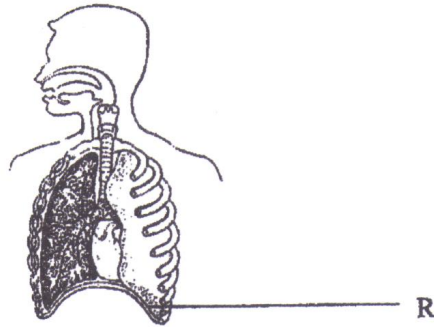


Diagram 14  
*Rajah 14*

What happen to structure R during exhalation?  
*Apakah yang berlaku ke atas struktur R semasa hembus nafas?.*

- A Contract and become flatten  
*Mengecut dan mendatar*
- B Contract and become doom shape  
*Mengecut dan melengkung*
- C Relax and become flatten  
*Mengendur dan mendatar*
- D Relax and become doom shape  
*Mengendur dan melengkung*

- 36 Diagram 15 shows the structure of alveoli.  
*Rajah 15 menunjukkan struktur alveolus.*

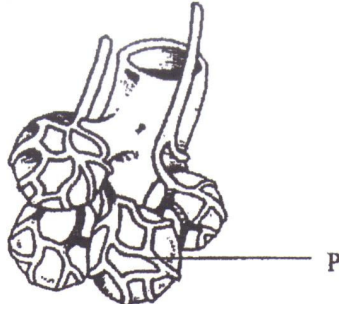
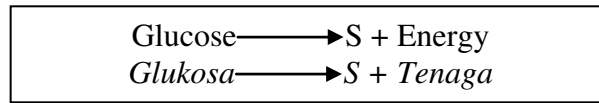


Diagram 15  
*Rajah 15*

What process occurs between alveolus and structure P during gaseous exchange?  
*Apakah proses yang berlaku di antara alveolus dengan struktur P semasa pertukaran gas?*

- A Osmosis  
*Osmosis*
- B Diffusion  
*Resapan*
- C Facilitated diffusion  
*Resapan berbantu*
- D Active transport  
*Pengangkutan aktif*
- 37 Which structure is involved in the gaseous exchange in *Ameoba* ?  
*Struktur yang manakah yang terlibat dalam pertukaran gas dalam Ameoba?*
- A Cell wall  
*Dinding sel*
- B Nucleus  
*Nukleus*
- C Cell membrane  
*Membran sel*
- D Vacuole  
*Vakuol*
- 38 The following equation shows the process that take place in yeast.

*Persamaan berikut menunjukkan proses yang berlaku dalam yis.*



*What is S?*

*Apakah S?*

- A Water  
*Air*
- B Ethanol  
*Etanol*
- C Lactic acid  
*Asid laktik*
- D Carbon dioxide  
*Karbon dioksida*

- 39 Diagram 16 shows a model of a human lungs.  
*Rajah 16 menunjukkan model peparu manusia.*

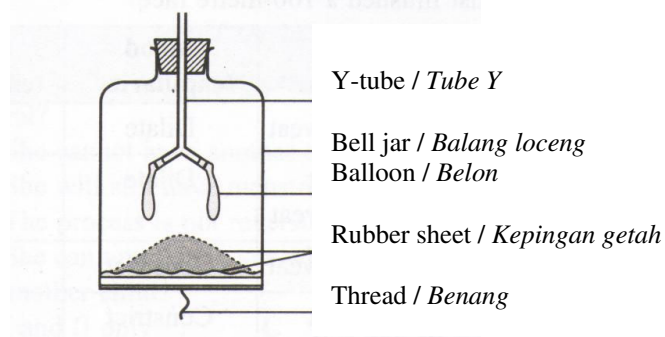


Diagram 16  
*Rajah 16*

What happens when the thread is pulled downwards?  
*Apa yang terjadi apabila benang ditarik ke bawah?*

- A Air rushes in and fills up the balloons  
*Udara masuk dan memenuhi belon*
- B The volume of the bell jar decreases  
*Isipadu dalam balang gas berkurang*
- C The pressure in the bell jar increases  
*Tekanan dalam balang gas bertambah*
- D The volume of the balloons decreases slowly  
*Isipadu belon berkurang dengan perlahan*

40 Which of the following comparison are true?

*Yang manakah antara berikut adalah perbezaan yang benar?*

	<b>Respiration</b> <i>Respirasi</i>	<b>Photosynthesis</b> <i>Fotosintesis</i>
I	Takes places only in a dark <i>Berlaku ditempat gelap sahaja</i>	Takes place only in light <i>Berlaku di tempat terang sahaja</i>
II	Oxygen is used <i>Oksigen digunakan</i>	Oxygen is produced <i>Oksigen dihasilkan</i>
III	Chlorophyll does not plays a role <i>Klorofil tidak memainkan peranan</i>	Chlorophyll is essential <i>Klorofil diperlukan</i>
IV	Plant gains weight <i>Tumbuhan bertambah berat</i>	Plant loses weight <i>Tumbuhan hilang berat</i>

- A I and III only  
*I dan III sahaja*
- B II and III only  
*II dan III sahaja*
- C II, III and IV only  
*II, III dan IV sahaja*
- D I, II, III and IV  
*I, II, III dan IV*

41 Which group of organism obtains its organic substances by external digestion on dead organisms?

*Antara berikut, kumpulan organisma yang manakah memperoleh bahan organik ringkas melalui pencernaan luar sel ke atas organisma mati?*

- A Epiphytes  
*Epifit*
- B Parasites  
*Parasit*
- C Saprophytes  
*Saprofit*
- D Commensal  
*Komensal*

- 42 In the colonisation of a mangrove swamp, which of the following mangrove tree is furthest away from the mud banks?

*Dalam pengkolonian kawasan paya bakau, pokok bakau yang manakah didapati paling jauh daripada tebing lumpur?*

- A *Rhizophora sp.*
  - B *Bruguiera sp.*
  - C *Avicennia sp.*
  - D *Sonneratia sp.*
- 43 Which of the following is an example of commensalism?

*Antara berikut, yang manakah adalah contoh hubungan komensalisme?*

- A Barnacles on plant shoots  
*Teritip pada pucuk tumbuhan*
- B Bracket fungus on woody stems  
*Kulat tetupai pada batang kayu*
- C Algae and fungi in lichen  
*Alga dan kulat pada kulampair*
- D Remora fish and shark  
*Ikan remora dan ikan yu*

- 44 What are the factors that need to be considered when using the technique of capture mark-release and recapture to estimate the population of animals?  
*Apakah faktor yang patut dipertimbangkan semasa menggunakan teknik tangkap tanda-lepas dan tangkap semula untuk menganggarkan populasi haiwan?*
- I The population of animals must be stable  
*Populasi haiwan mestilah stabil*
  - II The animals are captured randomly  
*Haiwan itu mesti ditangkap secara rawak*
  - III The substance used be for marking must be long lasting  
*Bahan penanda yang digunakan mestilah tahan lama*
  - IV The animals marked are able to exist freely with the other animals in the habitat  
*Haiwan yang ditandakan dapat bergaul semula dengan haiwan lain di habitatnya.*
- A I, II and III only  
*I, II dan III sahaja*
  - B I, II and IV only  
*I, II dan IV sahaja*
  - C II, III and IV only  
*II, III dan IV sahaja*
  - D I, II, III and IV  
*I, II, III dan IV*



- 45 In an experiment to estimate the population of snails in a certain habitat, the number of snails caught and marked is 120. The snails were then released. After three days, another 100 snails were caught. From the snails caught, 60 snails were not marked. What is the population of the snails in the habitat?

*Dalam suatu kajian tentang populasi siput babi bagi sesuatu habitat, bilangan siput babi yang ditangkap dan ditanda pada lawatan pertama ialah 120 ekor. Selepas ditanda, siput-siput itu dibebaskan. Selepas tiga hari, lawatan kedua dibuat dan 100 ekor siput babi ditangkap. Daripada bilangan yang ditangkap, terdapat 60 ekor siput yang tidak bertanda. Berapakah populasi siput babi di kawasan itu?*

- A 1200
- B 600
- C 300
- D 200

46 What are the adaptive characteristics of *Rhizophora sp.* found in the mangrove swamp?

*Apakah ciri-ciri penyesuaian Rhizophora sp. untuk hidup di kawasan paya bakau?*

- I Has viviparity seeds  
*Mempunyai biji benih vivipariti*
  - II Has intensive prop roots for support in soft soil  
*Mempunyai akar jangkang yang luas untuk menyokong dalam tanah yang lembut*
  - III Has supportive root systems to bind the loose sand particles together  
*Mempunyai sistem akar sokong untuk mengikat pasir yang longgar*
  - IV Is able to remove excess salt from the tree  
*Mempunyai kebolehan untuk menyingkirkan garam yang berlebihan daripada pokok*
- A I and III only  
*I dan III sahaja*
  - B I, II and III only  
*I, II dan III sahaja*
  - C I, II and IV only  
*I, II dan IV sahaja*
  - D II, III and IV only  
*II, III dan IV sahaja*

- 47 The Figure 17 shows an activity.  
*Rajah 17 menunjukkan satu aktiviti.*

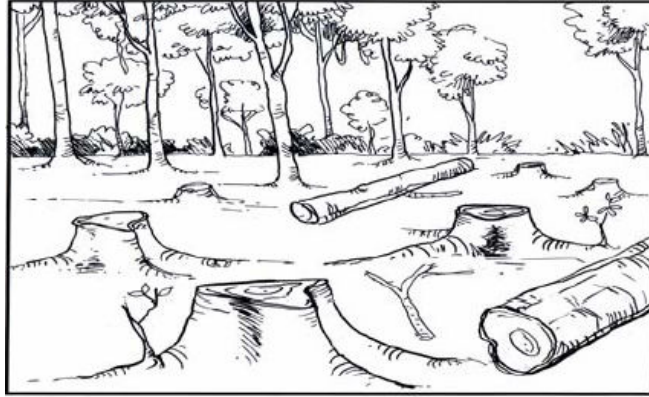


Diagram 17  
*Rajah 17*

Which of the following are the effects of the activity?  
*Antara berikut yang manakah merupakan kesan aktiviti itu?*

- I Flash flood  
*Banjir kilat*
  - II Landslide  
*Tanah runtuh*
  - III Global warming  
*Pemanasan global*
  - IV Thinning of the ozone layer  
*Penipisan lapisan ozon*
- A I, II and III only  
*I, II dan III sahaja*
  - B I, II and IV only  
*I, II dan IV sahaja*
  - C II, III and IV only  
*II, III dan IV sahaja*
  - D I,II,III and IV  
*I,II,III dan IV*

- 48 The following information shows steps in the reactions during the destruction of the ozone layer.

*Maklumat berikut menunjukkan langkah-langkah dalam tindak balas semasa pemusnahan lapisan ozon .*

T	Chlorine atom reacts with ozone to produce chlorine monoxide and oxygen molecules <i>Atom klorin bertindak balas dengan ozon untuk menghasilkan klorin monoksida dan molekul oksigen</i>
U	Free oxygen atom will break the chlorine monoxide bond <i>Atom oksigen bebas akan memutuskan ikatan klorin monoksida</i>
V	Ultra violet ray breaks the chlorine chemical bond in CFC to produce free chlorine atom <i>Sinar ultra ungu memutuskan ikatan kimia klorin dalam CFC untuk menghasilkan atom klorin bebas</i>
W	Free chlorine atom repeats the chain reaction <i>Atom klorin bebas mengulangi tindak balas rantai</i>

Which of the following sequences of steps is correct during ozone destruction?

*Antara berikut, yang manakah merupakan langkah yang betul semasa pemusnahan ozon ?*

- A T, V, U, W
- B U, T, V, W
- C V, T, U, W
- D V, U, T, W
- 49 Which of the following can be used as an alternative source to replace non-renewable energy sources?
- Antara berikut, yang manakah boleh digunakan sebagai sumber alternatif bagi menggantikan sumber tenaga yang tidak boleh diperbaharui ?*
- A Coal  
*Arang batu*
- B Fossil fuels  
*Bahan api fosil*
- C Wind energy  
*Tenaga Ombak*
- D Oil  
*Minyak*

- 50 The management of development activities must take into consideration the aspects of sustaining the ecosystem so that ...
- Pengurusan aktiviti pembangunan mestilah memberi pertimbangan berkaitan aspek pengekalan ekosistem supaya ....*
- I there is no deterioration in the quality of the environment  
*tiada kemusnahan kualiti alam sekitar*
  - II the balance of nature is maintained  
*keseimbangan alam semulajadi dikekalkan*
  - III the richness of the biodiversity is maintained  
*kekayaan biodiversity dikekalkan*
  - IV the negative impacts of unplanned development can be reduced  
*kesan negatif dari pembangunan yang tidak terancang boleh dikurangkan*
- A I and III only  
*I dan III sahaja*
  - B II and III only  
*II dan III sahaja*
  - C I, II and IV only  
*I, II dan IV sahaja*
  - D I,II,III and IV  
*I,II,III dan IV*

**END OF QUESTION PAPER  
KERTAS SOALAN TAMAT**

4551/2  
Biologi  
Kertas 2  
OKT/NOV  
2009

2  $\frac{1}{2}$  jam

Nama:.....

Tingkatan:.....



**JABATAN PELAJARAN MELAKA**

**PEPERIKSAAN SELARAS AKHIR TAHUN  
TINGKATAN EMPAT 2009**

**BIOLOGI**

Kertas 2

Dua jam tiga puluh minit

**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

1. Kertas soalan ini mengandungi tiga bahagian. **Bahagian A, Bahagian B dan Bahagian C.** Jawab **semua** soalan dalam **Bahagian A**, **satu** soalan daripada **Bahagian B** dan **satu** soalan dari **Bahagian C**
2. Jawapan kepada **Bahagian A** hendaklah ditulis dalam ruang jawapan yang disediakan dalam kertas soalan. Langkah penting dalam kerja mengira hendaklah ditunjukkan.
3. Jawapan kepada Bahagian B dan Bahagian C hendaklah ditulis pada ruang jawapan yang disediakan. Anda diminta menjawab dengan lebih panjang untuk Bahagian B dan Bahagian C tetapi jawapan mestilah jelas dan logik. Dalam jawapan anda, persamaan, gambar rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda boleh digunakan.
4. Jawapan kepada ketiga-tiga bahagian ini hendaklah diserahkan bersama-sama. Anda hendaklah menyerahkan kertas tulis dan kertas graf tambahan.
5. Penggunaan kalkulator saintifik yang **tidak** boleh diprogramkan adalah dibenarkan.

<i>Untuk Kegunaan Pemeriksa</i>			
Bahagian	Soalan	Markah penuh	Markah dipelehi
A	1	12	
	2	12	
	3	12	
	4	12	
	5	12	
B	6	20	
	7	20	
C	8	20	
	9	20	
Jumlah		100	

Kertas soalan ini mengandungi 19 halaman bercetak

**INFORMATION FOR CANDIDATES**  
**MAKLUMAT UNTUK CALON**

1. This question consists of two sections: **Section A** and **Section B**.  
*Kertas soalan ini mengandungi dua bahagian: **Bahagian A** dan **Bahagian B**.*
2. Answer **all** questions in **Section A**. Write your answer for **Section A** in the space provided in the question paper.  
*Jawab **semua** soalan dalam **Bahagian A**. Jawapan anda bagi **Bahagian A** hendaklah ditulis pada ruang yang disediakan dalam kertas soalan ini.*
3. Answer any **two** questions from **Section B**. Write your answer for **Section B** on the 'helaian tambahan' provided by the invigilators. You may use equations, diagrams, graph and other suitable methods to explain your answer.  
*Jawab mana-mana **dua** soalan daripada **Bahagian B**. Jawapan anda bagi **Bahagian B** hendaklah ditulis dalam helaian tambahan yang dibekalkan oleh pengawas peperiksaan. Anda boleh menggunakan persamaan, rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda.*
4. The diagrams in the questions are not drawn to scale unless stated.  
*Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
5. The marks allocated for each question or sub-part of a questions are shown in brackets.  
*Markah yang diperuntukkan bagi setiap soalan atau ceraihan soalan ditunjukkan dalam kurungan.*
6. If you wish to change your answer, cross out the answer that you have done. Then write down the next answer.  
*Jika anda hendak menukar jawapan, batalkan jawapan yang telah dibuat. Kemudian tulis jawapan yang baru.*
7. You may use a non-programmable scientific calculator.  
*Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.*
8. You are advised to spend 90 minutes to answer question in **Section A** and 60 minutes for **Section B**.  
*Anda dinasihatkan supaya mengambil masa 90 minit untuk menjawab soalan dalam Bahagian A dan 60 minit untuk soalan Bahagian B.*
9. Detach **Section B** from this question paper. Tie the 'helaian tambahan' together with this question paper and hand in to the invigilator at the end of the examination.  
*Ceraikan **Bahagian B** daripada kertas soalan ini. Ikatkan helaian tambahan bersama-sama kertas soalan ini dan serahkan kepada pengawas peperiksaan pada akhir peperiksaan.*

SECTION A

[ 60 marks ]

Answer all questions in this section.

*Jawab semua soalan dalam bahagian ini*

1. Diagram 1 shows two cells , X and Y.  
*Rajah 1 menunjukkan dua sel, X dan Y.*

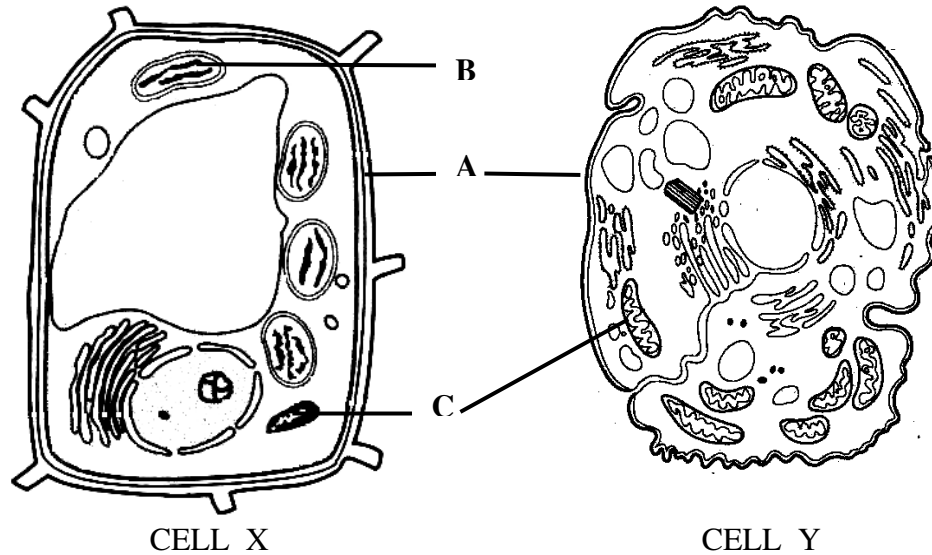


Diagram 1  
*Rajah 1*

- (a) (i) Name A, B and C.  
*Namakan A, B dan C.*

A : \_\_\_\_\_  
 B : \_\_\_\_\_  
 C : \_\_\_\_\_

[3 mark]

- (ii) State one function of :  
*Nyatakan satu fungsi bagi:*

B : \_\_\_\_\_  
 \_\_\_\_\_  
 C : \_\_\_\_\_  
 \_\_\_\_\_

[2 mark]

- (b) Which is a plant cell, X or Y ? Why?  
*Yang manakah sel tumbuhan, X atau Y? Kenapa?*

\_\_\_\_\_  
 \_\_\_\_\_

[2 mark]



- (c) State two differences between an animal cell and a plant cell.  
*Nyatakan dua perbezaan di antara sel haiwan dan sel tumbuhan.*

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[2 marks]

- (d) (i) Predict what happens to a cell if organelle C is absent.  
*Ramalkan apa akan berlaku kepada sel sekiranya tiada organel C.*

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---

[2 marks]

- (ii) Write a word equation to show the overall reaction that occurs in organelle C.

[1 mark]

2. Diagram 2 shows the chemical process of light reaction during photosynthesis.  
*Rajah 2 menunjukkan proses kimia dalam tindak balas cahaya semasa fotosintesis*

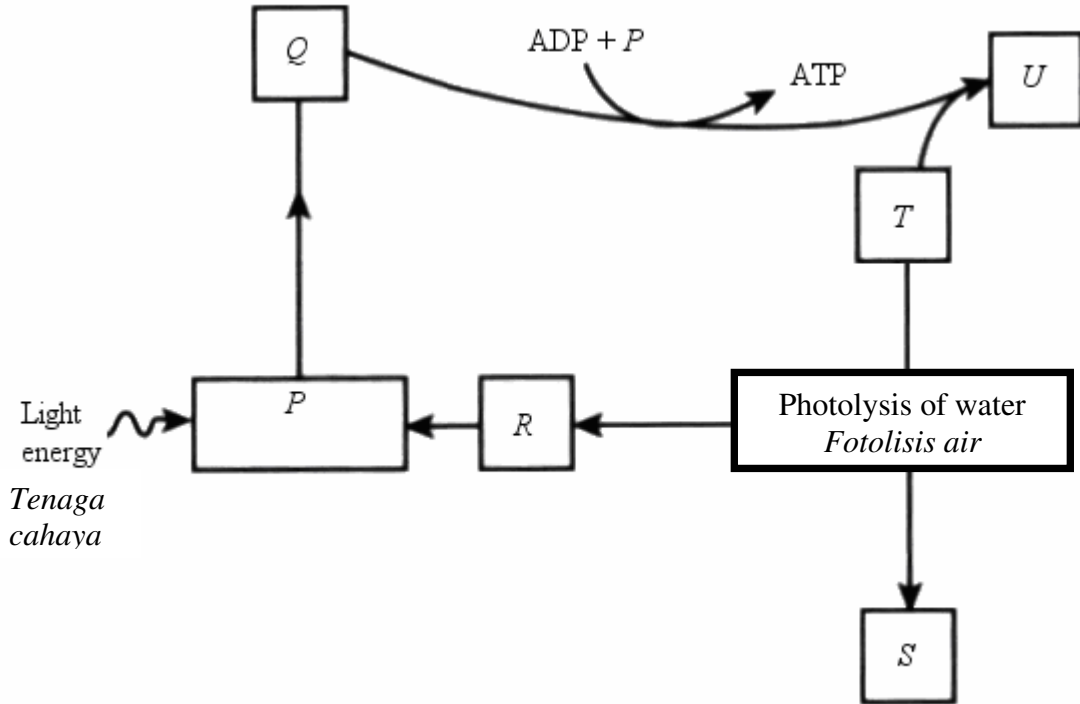


Diagram 2  
*Rajah 2*

- (a) What is meant by photosynthesis?  
*Apakah maksud fotosintesis?*

\_\_\_\_\_

\_\_\_\_\_

[2 marks]

- (b) Name *P, Q, R, S, T* and *U*.  
*Namakan P, Q, R, S, T dan U.*

P : \_\_\_\_\_  
 Q : \_\_\_\_\_  
 R : \_\_\_\_\_  
 S : \_\_\_\_\_  
 T : \_\_\_\_\_  
 U : \_\_\_\_\_

[4 marks]

- (c) State the difference between *Q* and *R*.  
 Nyatakan perbezaan di antara *Q* dan *R*.

---



---

[2 marks]

- (d) Name **two** products synthesised during light reaction which are used in the dark reaction of photosynthesis.  
 Namakan dua hasil yang disintesis semasa tindak balas cahaya dan digunakan dalam tindak balas gelap fotosintesis.

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[2 marks]

- (e) Name a by-product of photosynthesis and state the importance of this product to living organisms.  
 Namakan bahan sampingan proses fotosintesis dan nyatakan kepentingan bahan tersebut kepada organisma hidup.

---



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[2 marks]

3. Diagram 3 shows a reaction of an enzyme molecule on a fat molecule.  
 Rajah 3 menunjukkan tindakbalas suatu molekul enzim terhadap molekul lemak.

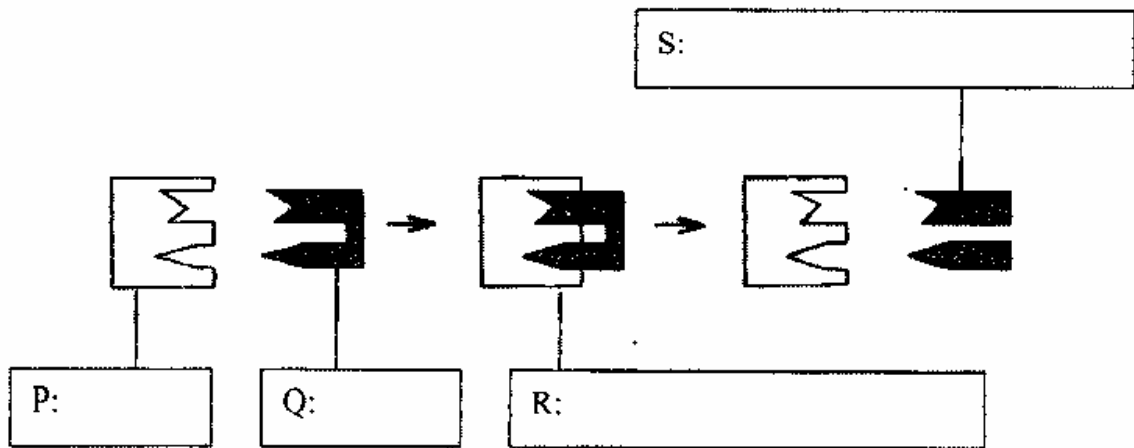


Diagram 3  
 Rajah 3

- (a) (i) Label P, Q, R and S in diagram 3.  
 Labelkan P, Q, R, dan S pada Rajah 3

[4 marks]

- (ii) State **two** characteristics of P.

*Berikan dua ciri P.*

1. \_\_\_\_\_
2. \_\_\_\_\_

[2 marks]

- (b) (i) Name the mechanism of enzyme reaction illustrated in Diagram 3. *Namakan mekanisme tindak balas enzim seperti yang ditunjukkan pada Rajah 3.*

\_\_\_\_\_ [1 mark]

- (ii) Explain the mechanism that you have mentioned in (b) (i).

*Terangkan mekanisme yang anda berikan dalam (b)(i).*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

[2 marks]

- (c) Enzymes are used widely in industries.

State one usage of lipase in food industry.

*Enzim digunakan secara meluas dalam pelbagai industri.*

*Berikan satu kegunaan lipase dalam industri makanan.*

\_\_\_\_\_ [1 mark]

- (d) The temperature at which a lipase reaction takes place is increased to more than 60° C. State the effect on the quantity of the product. Explain your answer.

*Sahu bagi tindakbalas lipase telah dinaikkan melebihi 60° C. Nyatakan kesannya ke atas kuantiti hasil tindak balas itu. Terangkan jawapan anda.*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

[2 marks]

4. The diagram 4 shows two different cells undergoing cell division.  
*Rajah 4 menunjukkan dua sel berbeza yang menjalani pembahagian sel.*

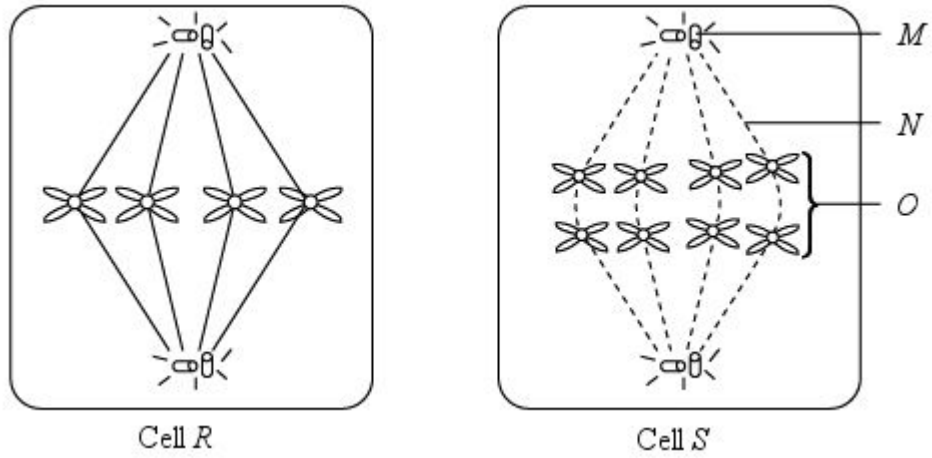


Diagram 4  
*Rajah 4*

- (a) (i) Based on the diagram, are these animal cells or plant cells?  
*Berdasarkan rajah, adakah sel tersebut adalah sel haiwan atau sel tumbuhan ?*

\_\_\_\_\_ [1 mark]

- (ii) Give two reasons for your answer in (a)(i).  
*Berikan dua sebab untuk jawapan anda di (a)(i).*

\_\_\_\_\_  
 \_\_\_\_\_ [2 marks]

- (b) Name the structures labelled *M*, *N* and *O*.  
*Namakan struktur berlabel M, N dan O.*

*M* : \_\_\_\_\_  
*N* : \_\_\_\_\_  
*O* : \_\_\_\_\_

[3 marks]

- (c) State the functions of *M* and *N*.  
*Nyatakan fungsi M dan N.*

\_\_\_\_\_  
 \_\_\_\_\_ [2 marks]

- (d) Name the types of cell division shown by  
*Namakan jenis pembahagian sel yang ditunjukkan oleh*
- (i) cell R: \_\_\_\_\_  
*sel R:* \_\_\_\_\_ [1 mark]
- (ii) Cell S: \_\_\_\_\_  
*sel S:* \_\_\_\_\_ [1 mark]
- (e) Name the stage of cell division shown by  
*Namakan peringkat pembahagian sel yang ditunjukkan oleh*
- (i) cell R: \_\_\_\_\_  
*sel R:* \_\_\_\_\_ [1 mark]
- (ii) cell S: \_\_\_\_\_  
*sel S:* \_\_\_\_\_ [1 mark]

5. Diagram 5 shows a profile of a mangrove swamp with three main zones.  
*Rajah 5 menunjukkan profil satu kawasan paya bakau dengan tiga zon utama.*

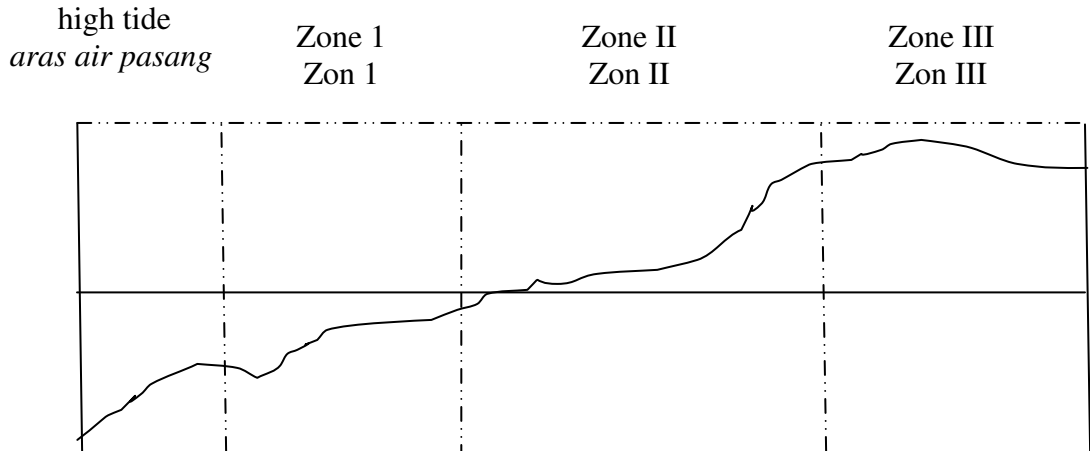


Diagram 5  
*Rajah 5*

- (a) In the space provided on Diagram 5, draw the types of roots for the mangrove trees in zone I, zone II dan zone III.  
*Dalam ruang yang disediakan pada rajah 5, lukis jenis akar pokok bakau di zon I, zon II dan zon III.* [ 2 marks]

- (b) Name a plant species that can be found in zone I.  
*Namakan satu spesies tumbuhan yang terdapat di zon I.*
- \_\_\_\_\_
- [1 mark]
- (c) (i) Name the special structure on the roots of mangrove trees in zone I.  
*Namakan struktur khas yang terdapat pada akar pokok bakau di zon I.*
- \_\_\_\_\_
- \_\_\_\_\_
- [1 mark]
- (ii) What is the main function of this structure?  
*Apakah tugas utama struktur tersebut?*
- \_\_\_\_\_
- \_\_\_\_\_
- [1 mark]
- (d) (i) Name the special reproduction method that is carried out by the mangrove trees in zone II.  
*Namakan cara pembiakan istimewa bagi pokok bakau yang terdapat di zon II.*
- \_\_\_\_\_
- [1 mark]
- (ii) State two problems that can be overcome through this reproduction method.  
*Nyatakan dua masalah yang dapat diatasi melalui cara pembiakan tersebut.*
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- [2 marks]
- (e) State two adaptations of the leaves for the mangrove trees in zone I, zone II and zone III.  
*Nyatakan dua penyesuaian daun pokok bakau di zon I, zon II dan zon III.*
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- [2 marks]
- (f) (i) If the mangrove swamp is left as it is for five years, suggest the type of trees that would appear in zone I after this period.  
*Jika kawasan paya bakau itu dibiarkan dalam keadaan semula jadi selama lima tahun, cadangkan jenis tumbuhan baru yang akan muncul di zon I selepas tempoh tersebut.*
- \_\_\_\_\_
- \_\_\_\_\_
- [1 mark]

- (ii) Give reasons for your answers.  
*Berikan sebab untuk jawapan anda.*

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[1 mark]

SECTION B  
[40 marks]

Answer any **two** questions from this section.  
*Jawab mana-mana **dua** soalan daripada bahagian ini.*

6. Diagram 6.1 shows the beginning and the end of an experiment to illustrate a physical process.  
*Rajah 6.1 menunjukkan permulaan dan akhiran untuk eksperimen yang ditunjukkan satu proses fizikal.*

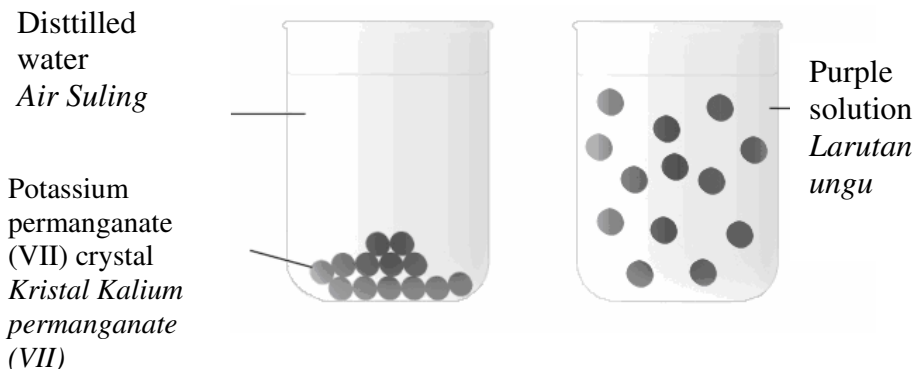


Diagram 6.1  
*Rajah 6.1*

- (a) (i) Give a brief explanation of the process shown in Diagram 6.1.  
*Berikan penerangan ringkas proses yang ditunjukkan dalam Rajah 6.1*

[4 marks]

- (ii)
- Fresh milk  
*Susu segar*
  - Fish  
*Ikan*

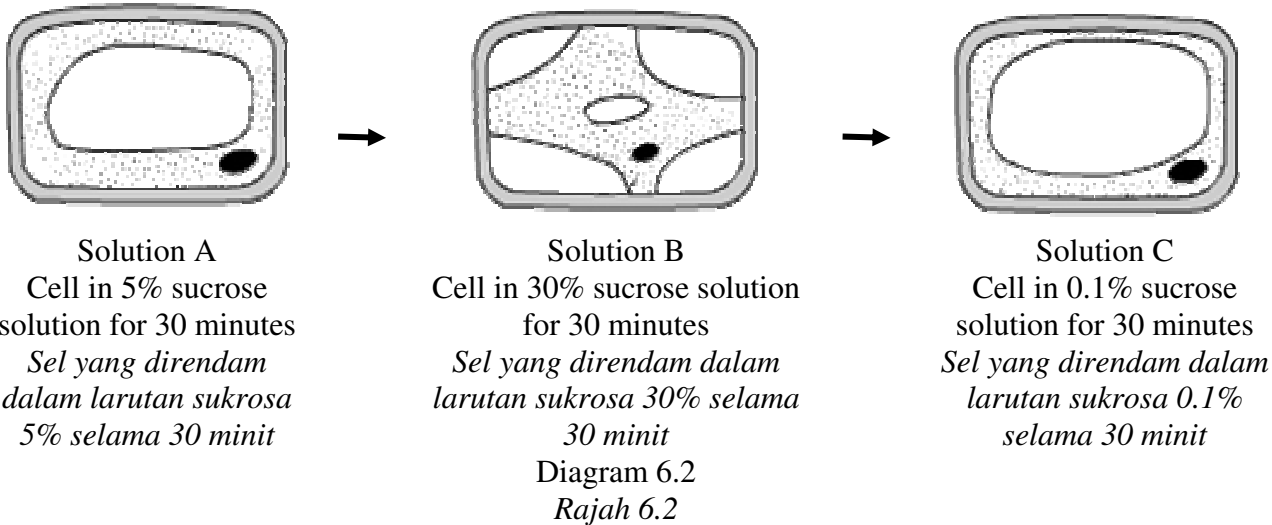
Explain **one** method by which the above food can be preserved for a long period of time.

*Terangkan satu kaedah untuk mengawet makanan tersebut untuk jangka masa yang lama.*

[6 marks]



- (b) Diagram 6.2 shows a plant cell immersed in different concentrations of sucrose solution.  
*Rajah 6.2 menunjukkan sel tumbuhan yang direndam dalam kepekatan larutan sukrosa yang berbeza.*



- (i) Explain what happens to the cell in each of the different concentrations of sucrose solution as shown in Diagram 6.2.  
*Terangkan apakah yang berlaku kepada setiap sel dalam setiap kepekatan larutan sukrosa yang berbeza dalam rajah 6.2.*

[10 marks]

7. Diagram 7 shows three organisms *P*, *Q* and *R*.  
*Rajah 7 menunjukkan tiga organisma P, Q dan R.*

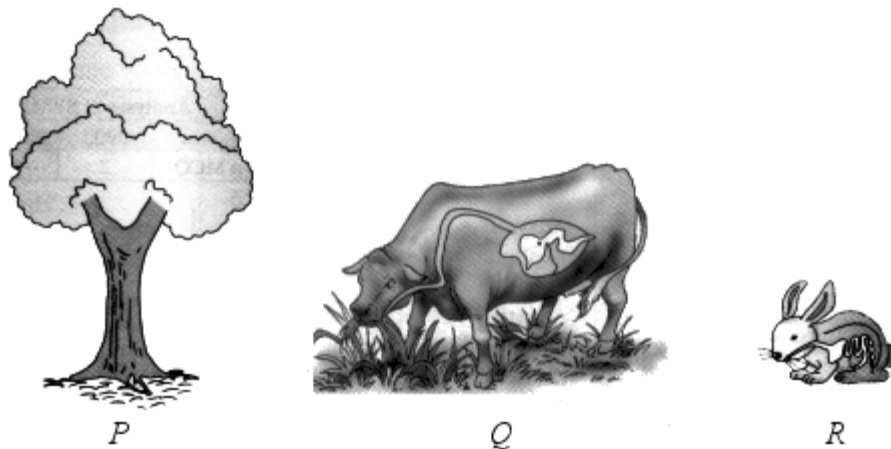


Diagram 7  
*Rajah 7*

- (a) (i) Describe the type of nutrition in *P* and *Q*.  
*Huraikan jenis nutrisi pada P dan Q.*

[4 marks]

- (ii) Explain **one** similarity and **four** differences for the alimentary canals and types of nutrition between *Q* and *R*.  
*Terangkan satu persamaan dan empat perbezaan salur alimentari dan jenis nutrisi antara Q dan R.*

[10 marks]

(b)

Poor eating habits result in health problems such as obesity, anaemia and constipation.  
*Amalan pemakanan yang tidak sihat akan menyebabkan masalah kesihatan seperti obesiti, anemia dan sembelit.*

Based on the statement above, state the causes and suggest ways on how to overcome the health problems mentioned in the statement.

*Berdasarkan kenyataan di atas, nyatakan punca dan cadangkan cara untuk mengatasi setiap masalah kesihatan yang dinyatakan.*

[6 marks]

8. (a) Diagram 8.1 shows *Amoeba sp.* that lives freely in freshwater.  
*Rajah 8.1 menunjukkan Amoeba sp. yang hidup bebas di air tawar.*

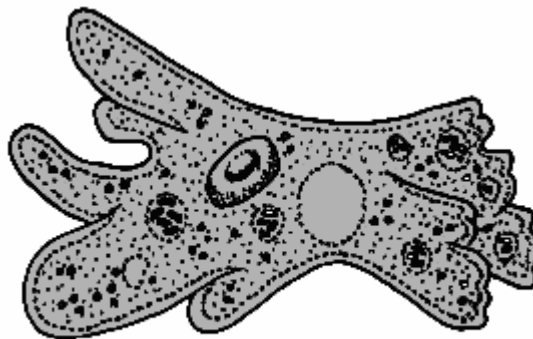


Diagram 8.1  
*Rajah 8.1*

- (i) Explain how this unicellular organism carries out gaseous exchange to fulfill its needs  
*Terangkan bagaimana organisma unisel ini melakukan pertukaran gas untuk memenuhi keperluan hidup.*

[4 marks]

- (b) Diagram 8.2 shows the structures found in the respiratory systems of two organisms, X and Y.  
*Rajah 8.2 menunjukkan struktur yang dijumpai dalam sistem respirasi dua bagi organisma X dan Y.*

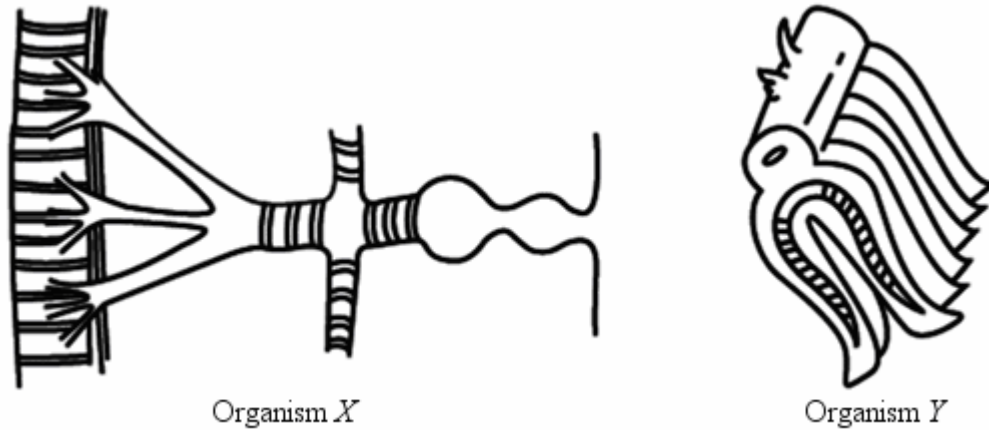


Diagram 8.2  
*Rajah 8.2*

- (i) Explain how the structures shown in the diagram above is adapted to carry out the gaseous exchange process efficiently.  
*Terangkan bagaimana struktur yang ditunjukkan di atas disesuaikan untuk melakukan proses pertukaran gas secara efisien.*

[6 marks]

- (c) Diagram 8.3 shows the structures involved in the human breathing mechanism.  
*Rajah 8.3 menunjukkan struktur yang terlibat dalam mekanisma pernafasan manusia.*

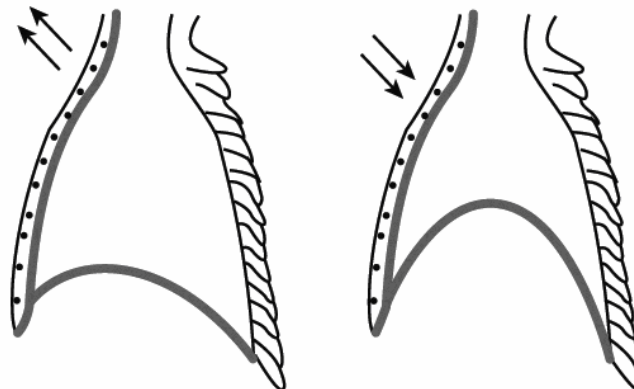


Diagram 8.3  
*Rajah 8.3*

- (i) Based on Diagram 8.3, explain how the mechanism of breathing involving intercostal muscles, rib cage and diaphragm occur.  
*Berdasarkan Rajah 8.3, terangkan bagaimana mekanisma pernafasan melibatkan otot interkostal, sangkar rusuk dan diafragma berlaku.*

[10 marks]

9. (a) Diagram 9.1 shows one of the environmental phenomena which has become a current topic of discussion.  
*Rajah 9.1 menunjukkan satu daripada fenomena alam sekitar yang menjadi isu perbincangan masa kini.*

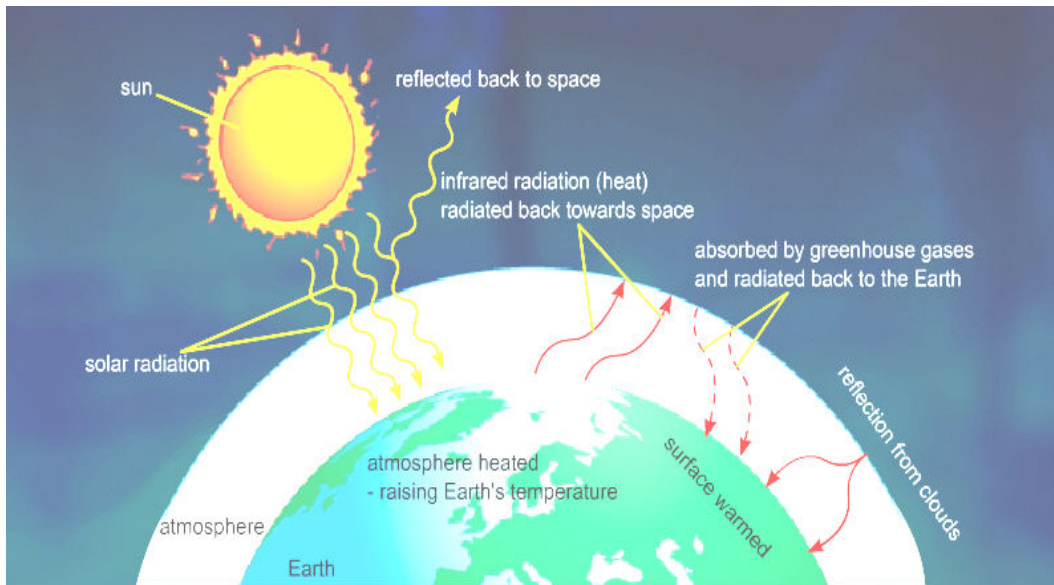


Diagram 9.1  
*Rajah 9.1*

- (i) Name this phenomenon and explain how it happens.  
 If you are an environmental activist, suggest how would you explain to society about the measures needed to overcome the phenomenon.  
*Namakan fenomena ini dan terangkan bagaimana fenomena ini berlaku.  
 Jika anda adalah seorang aktivis alam sekitar, cadangkan bagaimana anda akan menerangkan kepada orang ramai tentang langkah-langkah yang diperlukan untuk mengatasi fenomena ini.*

[ 10 marks]

- (b) A tropical forest areas developed into an industrial area as shown in Diagram 9.2.  
*Kawasan hutan tropika dibangunkan menjadi kawasan perindustrian seperti yang ditunjukkan pada Rajah 9.2.*

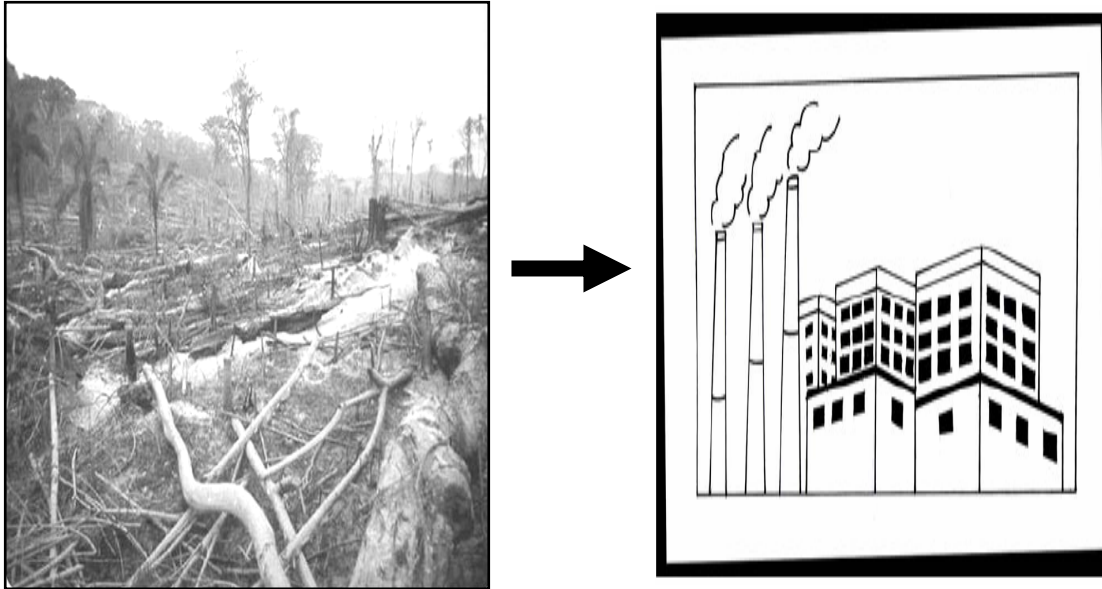


Diagram 9.2  
*Rajah 9.2*

- (i) Discuss the good and the bad social, economic and environmental effects of this development.  
*Bincangkan kesan baik dan kesan buruk sosial, ekonomi dan persekitaran akibat pembangunan ini.*

[10 marks]

**END OF QUESTION PAPER**

4551/3  
**Biologi**  
**Kertas 3**  
**OKT/NOV**  
**2009**

1  $\frac{1}{2}$  jam

Nama : .....

Tingkatan : .....



**JABATAN PELAJARAN MELAKA**

**PEPERIKSAAN SELARAS AKHIR TAHUN**  
**TINGKATAN 4**  
**2009**

**BIOLOGI**

**KERTAS 3**

Satu jam tiga puluh minit

**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

	Kod Pemeriksa		
	Nombor soalan	Markah penuh	Markah diperolehi
1. Tulis nama dan kelas anda pada ruang yang disediakan.	1	33	
2. Calon dikehendaki menjawab <b>semua</b> soalan.	2	Respon 15	
3. Calon dikehendaki membaca maklumat di halaman 2		Laporan 2	
		Jumlah	

Kertas soalan ini mengandungi **12** halaman bercetak







**INFORMATION FOR CANDIDATES**  
**MAKLUMAT UNTUK CALON**

1. This question consists of two question: **Question 1** and **Question 2**.  
*Kertas soalan ini mengandungi dua soalan: **Soalan 1** dan **Soalan 2**.*
2. Answer **all** questions in. Write your answer for **Question 1** in the space provided in the question paper.  
*Jawab **semua** soalan. Jawapan anda bagi **Soalan 1** hendaklah ditulis pada ruang yang disediakan dalam kertas soalan ini.*
3. Write your answers for **Question 2** on the “helaian tambahan” provided by the invigilators. You may use equations, diagrams, graph and other suitable methods to explain your answer.  
*Jawab anda bagi soalan **Soalan 2** hendaklah ditulis dalam helaian tambahan yang dibekalkan oleh pengawas peperiksaan. Anda boleh menggunakan persamaan, rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda.*
4. Show your working, it may help you to get marks.  
*Tunjukkan kerja pengiraan, ini boleh membantu anda mendapat markah.*
5. The diagrams in the questions are not drawn to scale unless stated.  
*Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
6. The marks allocated for each question or sub-part of a questions are shown in brackets.  
*Markah yang diperuntukkan bagi setiap soalan atau ceraihan soalan ditunjukkan dalam kurungan.*
7. 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 baru.*
8. You may use a non-programmable scientific calculator.  
*Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh deprogram.*
9. You are advised to spend 45 minutes to answer question in **Question 1** and 45 minutes for **Question 2**.  
*Anda dinasihatkan supaya mengambil masa 45 minit untuk menjawab soalan dalam **Soalan 1** dan 45 minit untuk soalan **Soalan 2**.*
10. Detach **Section B** from this question paper. Tie the “helaian tambahan” together with this question paper and hand in to the invigilator at the end of the examination.  
*Ceraikan **Bahagian B** daripada kertas soalan ini. Ikatkan helaian tambahan bersama-sama kertas soalan ini dan serahkan kepada pengawas peperiksaan pada akhir peperiksaan.*

**Answer all questions***Jawab semua soalan*

Time suggested to complete each question is 45 minutes.

*Masa yang dicadangkan untuk menjawab setiap soalan ialah 45 minit.*

1. An experiment was set up by a group of students to determine the concentration of sucrose solution that is isotonic to the potato cell sap. The students carried out the following steps.  
*Ekspirimen telah dilaksanakan oleh sekumpulan pelajar untuk mengenalpasti kepekatan larutan sukrosa yang isotonic terhadap sap sel kentang. Pelajar tersebut telah mengikut langkah-langkah berikut.*

Step 1: Six cylindrical strips of potato were obtained using a cork borer. Each strip was measured and cut into a length of 5 cm.

*Langkah 1: Enam jalur silinder kentang dipotong dengan menggunakan penebuk gabus. Setiap jalur kentang diukur dan dipotong dengan panjang 5 cm.*

Step 2: Six test tubes were labelled A, B, C, D, E and F.

*Langkah 2: Enam tabung uji dilabel A, B, C, D, E dan F.*

Step 3: The test tube were filled with different concentrations of solutions as listed below and placed upright on a test tube rack.

*Langkah 3: Enam tabung uji diisi dengan kepekatan larutan yang berbeza mengikut senarai di bawah dan diletakkan di rak tabung uji.*

Test tube A	: 10 ml of distilled water
Test tube B	: 10 ml of 0.2 mol dm <sup>-3</sup> sucrose solution
Test tube C	: 10 ml of 0.4 mol dm <sup>-3</sup> sucrose solution
Test tube D	: 10 ml of 0.6 mol dm <sup>-3</sup> sucrose solution
Test tube E	: 10 ml of 0.8 mol dm <sup>-3</sup> sucrose solution
Test tube F	: 10 ml of 1.0 mol dm <sup>-3</sup> sucrose solution

Step 4: One strip of potato was added into each of the test tubes A to F, and left to stand for an hour as shown in Diagram 1.

*Langkah 4: Setiap satu jalur kentang dimasukkan ke dalam tabung uji A – F, dan dibiarkan selama 1 jam seperti ditunjukkan dalam Rajah 1.*

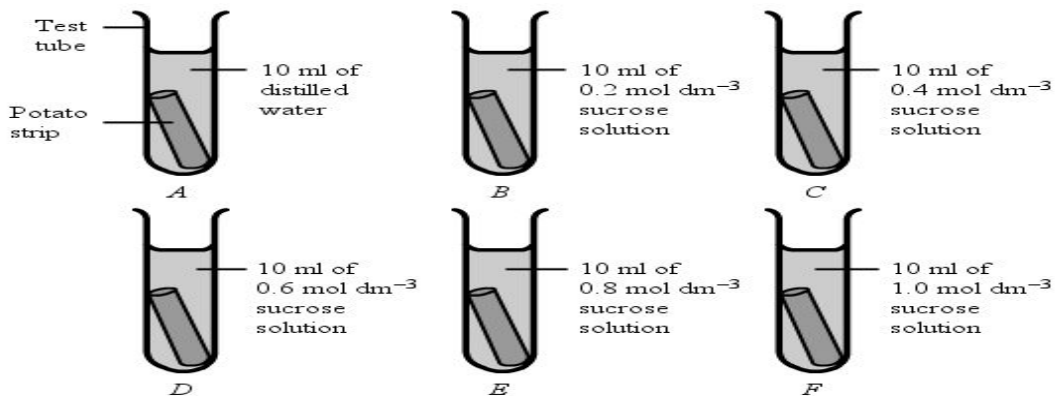


Diagram 1

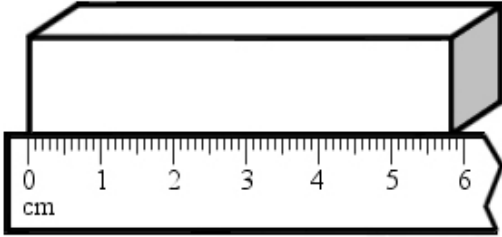
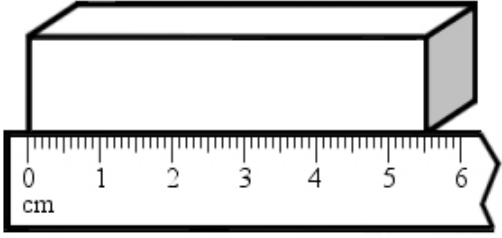
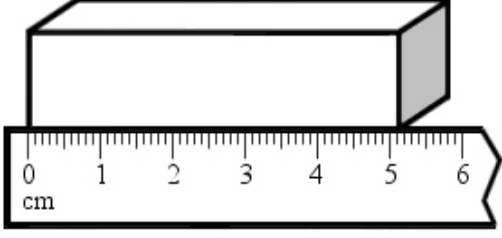
Rajah 1

Step5: After an hour, each potato strip is removed from the test tube using forceps and wiped till dry with a piece of filter paper. The lengths of the potato strips were measured and recorded in a table.

Langkah 5: Selepas satu jam, setiap jalur kentang dikeluarkan dari tabung uji dengan menggunakan forcep dan dikeringkan dengan menggunakan kertas turas. Panjang jalur kentang diukur dan direkodkan dalam jadual.

The results obtained are shown in the table 1 below.

Keputusan yang diperolehi direkodkan dalam jadual 1 di bawah.

Test tube Tabung uji	Concentration of sucrose solution ( $\text{mol dm}^{-3}$ ) Kepekatan larutan sukrosa ( $\text{mol dm}^{-3}$ )	Results Keputusan	Length of potato strip (cm) Panjang jalur kentang (cm)
A	0		
B	0.2		
C	0.4		

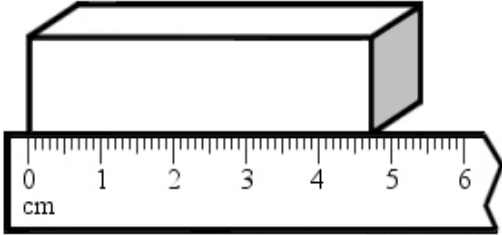
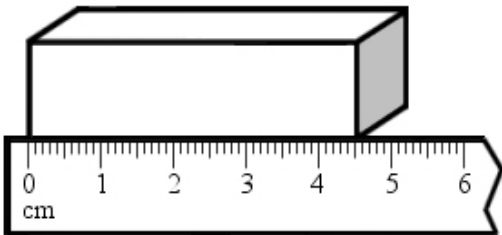
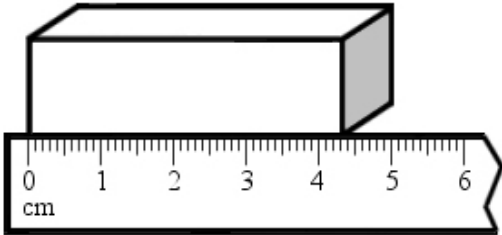
<p><i>D</i></p>	<p>0.6</p>		
<p><i>E</i></p>	<p>0.8</p>		
<p><i>F</i></p>	<p>1.0</p>		

Table 1  
Jadual 1

(a) (i) Based on Table 1, state **two** observation made during this experiment.  
Berdasarkan Jadual 1, nyatakan *dua* pemerhatian eksperimen ini.

(a) (i)

1. \_\_\_\_\_
2. \_\_\_\_\_

[3 marks]

(ii) State two inferences which corresponds to the observation in 1(a) (i)  
Nyatakan *dua inferen* yang sepadan dengan pemerhatian di 1(a)(i)

(a) (ii)

1. \_\_\_\_\_
2. \_\_\_\_\_

[3 marks]

- (b) In the spaces provided in table 1, record the lengths of the potato strips in the different concentrations of sucrose solutions.  
*Dalam ruangan yang disediakan dalam jadual 1, rekodkan panjang jalur kentang dalam kepekatan larutan sukrosa yang berlainan*

(b)

[3 marks]

- (c) Complete Table 2 based on this experiment  
*Lengkapkan Jadual 2 berdasarkan eksperimen ini.*

Variable	Method of handle the variable
Manipulated variable <i>Pembolehubah dimanipulasikan</i> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/>
Responding variable <i>Pembolehubah bergerak balas</i> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/>
Controlled variable <i>Pembolehubah dimalarkan</i> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/>

(c)

[3 marks]

Table 2  
 Jadual 2

- (d) State the hypothesis for this experiment  
*Nyatakan hipotesis untuk eksperimen ini.*

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(d)

- (e) (i) Record all the data collected in this experiment in Table 2.  
*Rekodkan data yang dikumpul dalam Jadual B.*

Test tube <i>Tabung uji</i>	Concentration of sucrose solution ( $\text{mol dm}^{-3}$ ) <i>Kepekatan larutan sukrosa (<math>\text{mol dm}^{-3}</math>)</i>	Length of potato strip (cm) <i>Panjang jalur kentang (cm)</i>		Difference in length (cm) <i>Perbezaan panjang (cm)</i>
		Initial length <i>Panjang awal</i>	Final length <i>Panjang akhir</i>	
<i>A</i>				
<i>B</i>				
<i>C</i>				
<i>D</i>				
<i>E</i>				
<i>F</i>				

(e)(i)

[3 marks]

Table 3  
*Jadual 3*

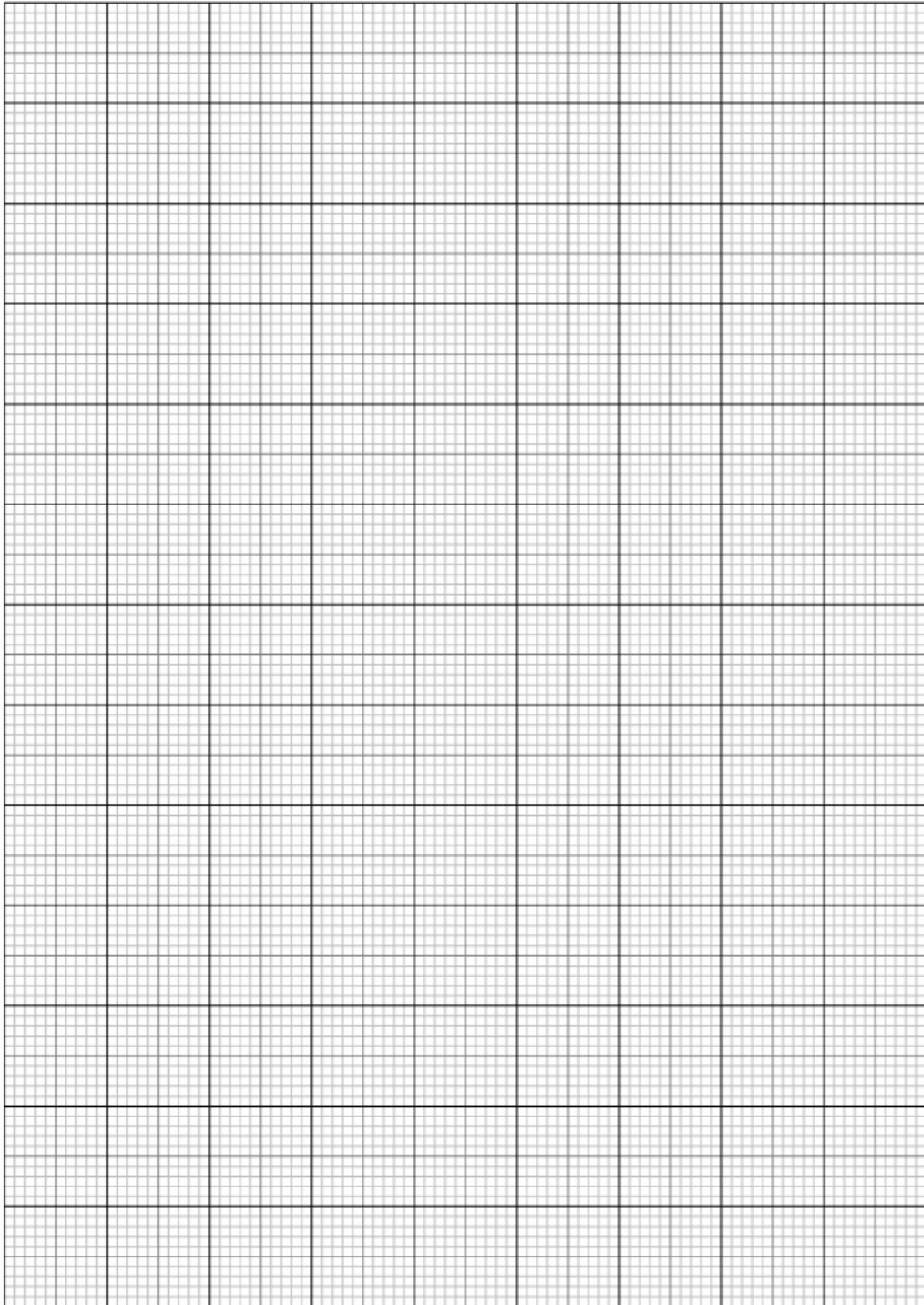
- (e) (ii) Draw a graph to show the change in length of the potato strip against the concentration of sucrose solution.  
*Lukiskan graf yang menunjukkan perubahan panjang jalur kentang melawan kepekatan larutan sukrosa.*

(e) (ii)

[3 marks]

Graph of the change in length of the potato strip against the concentration of sucrose solution.

Graf perubahan panjang jalur kentang melawan kepekatan larutan sukrosa.



- (f) From your graph, determine the concentration of the cell sap of the potato.

(f)

*Berdasarkan graf, nyatakan kepekatan sap sel kentang.*

[3 marks]

- (g) Explain the relationship between the changes in length of the potato strip and the concentration of sucrose solution.

(g)

*Terangkan hubungan antara perubahan panjang jalur kentang dan kepekatan larutan sukrosa.*

[3 marks]

- (h) List the apparatus and materials used in this experiment.

(h)

*Senaraikan alat dan radas yang digunakan dalam eksperimen ini.*

[3 marks]

Material <i>Bahan</i>	Apparatus <i>Radas</i>

- (i) Explain why excessive amount of fertilisers used on plants can cause the plants to wilt.

(i)

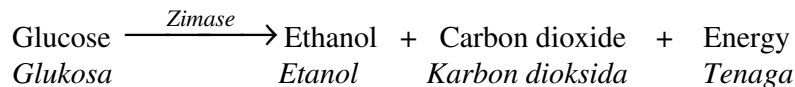
*Terangkan mengapakah berlebihan baja yang digunakan untuk tumbuhan akan menyebabkan tumbuhan itu layu.*

[3 marks]



- 2 Yeast cells can either respire aerobically (when oxygen is present), or anaerobically (in the absence of oxygen) to produce energy for their life processes. In the absence of oxygen, glucose is partially broken down to release carbon dioxide, ethanol, and heat energy. This anaerobic respiration of yeast is also called fermentation.

*Sel yis boleh menjalankan respirasi aerob (dalam keadaan beroksigen) atau menjalankan respirasi anaerob ( dalam keadaan tanpa oksigen) untuk menghasilkan tenaga bagi menjalankan pelbagai proses kemandiriannya. Dalam keadaan tanpa oksigen, glukosa separa terurai kepada karbon dioksida, etanol dan tenaga haba. Respirasi anaerob oleh yis ini dikenali juga sebagai penapaian.*



The rate of anaerobic respiration is affected by several factors such as temperature, pH values and nutrients.

*Kadar respirasi anaerob dipengaruhi oleh beberapa faktor seperti suhu, nilai pH dan nutrient.*

Based on the above information and equation, design a laboratory experiment to investigate the effect of temperature on the rate of anaerobic respiration in yeast  
*Berdasarkan maklumat dan persamaan di atas, reka bentuk satu eksperimen makmal untuk mengkaji kesan suhu ke atas kadar respirasi anaerob dalam yis.*

The planning of your experiment must include in the following aspects:  
*Perancangan eksperimen anda hendaklah meliputi aspek-aspek berikut:*

- Problem statement  
*Pernyataan masalah*
- Aim of investigation  
*Objektif kajian*
- Hypothesis  
*Hipotesis*
- Variables  
*Pembolehubah*
- List of apparatus and materials  
*Senarai radas dan bahan*
- Technique used  
*Teknik yang digunakan*
- Experimental procedure or method  
*Kaedah atau prosedur eksperimen*
- Presentation of data  
*Cara data dipersembahkan*
- Conclusion  
*Kesimpulan*

[17 marks]

**END OF QUESTION PAPER**