1 Diagram 1 shows an animal cell
Rajah 1 menunjukkan sel haiwan.

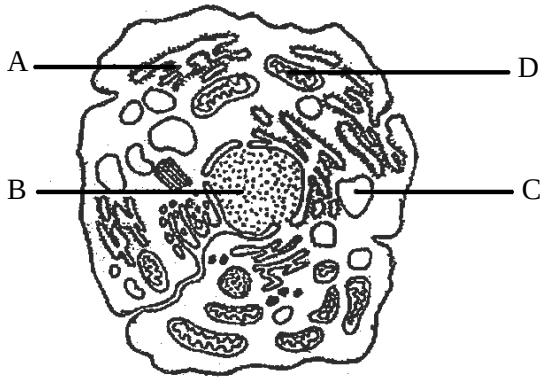


Diagram 1 / *Rajah 1*

Which organelles **A, B, C** or **D** is the site of cellular respiration?
*Antara organel **A, B, C** dan **D**, yang manakah adalah tapak respirasi sel?*

2 The following information refers to organelle M.
Maklumat berikut merujuk kepada organel M.

- Consists of a stack of flattened membrane-bound sacs
  Terdiri daripada lapisan membran nipis
- Function as a processing, packaging and transport centre of carbohydrates, protein and glycoproteins
  Berfungsi sebagai pusat memproses, membungkus dan mengangkut karbohidrat, protein dan glikoprotein

What is organelle M?
Apakah organel M?

A	Vacuole	/	*Vakuol*
B	Nukleus	/	*Nukleus*
C	Golgi apparatus	/	*Jasad Golgi*
D	Endoplasmic reticulum	/	*Retikulum endoplasma*

3 Which of the following is correct about the cellular structure and its function?
Antara berikut, pernyataan yang manakah adalah benar mengenai struktur sel dan fungsinya?

	Cellular structure ***Struktur sel***	**Function** ***Fungsi***
A	Ribosome *Ribosom*	To synthesise lipids *Untuk mensintesis lipid*
B	Lysosome *Lisosom*	To produce energy *Untuk menjana tenaga*
C	Cell wall *Dinding sel*	To control the passage of materials in and out of the cells *Untuk mengawal pergerakan bahan keluar dan masuk sel*
D	Endoplasmic reticulum *Jalinan endoplasma*	To transport substances to the Golgi apparatus *Untuk mengangkut bahan ke jasad Golgi*

4 Diagram 2 shows a type of muscle tissue found in the human body.
Rajah 2 menunjukkan sejenis tisu otot yang dijumpai di dalam badan manusia.

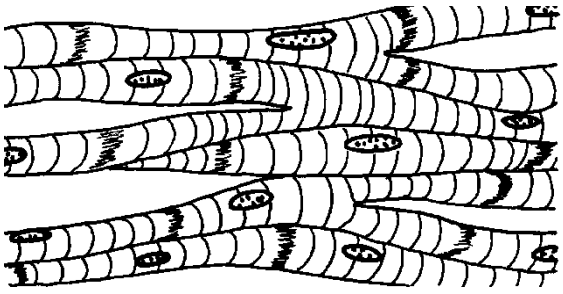


Diagram 2 / *Rajah 2*

Which system does the tissues found?
Dalam sistem manakah tisu ini dijumpai?

A Lymphatic system / *Sistem limfa*
B Circulatory system / *Sistem peredaran*
C Excretory system / *Sistem perkumuhan*
D Endocrine system / *Sistem endokrin*

5 Diagram 3 shows the structure of a plasma membrane.
Rajah 3 menunjukkan struktur membran plasma.

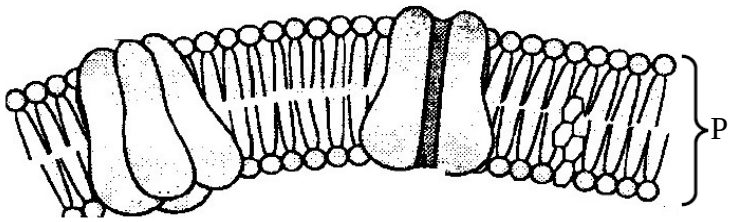


Diagram 3 / *Rajah 3*

Which of the following molecules can pass through P?
Manakah antara molekul berikut dapat merentasi P?

A Amino Acid / *Amino Asid*
B Water / *Air*
C Glycogen / *Glikogen*
D Starch / *Kanji*

6 Diagram 4 shows the condition of red blood cell samples which have been placed in different concentration of salt solutions M and N.
Rajah 4 menunjukkan keadaan sampel sel darah merah yang telah diletakkan di dalam larutan garam yang berbeza kepekatan, M dan N.

Condition of red blood cell *Keadaan sel darah merah*		
Solution Larutan	Salt solution M *Larutan garam M*	Salt solution N *Larutan garam N*

Diagram 4 / *Rajah 4*

What are the type of solution M and N?
Apakah jenis larutan M dan N?

	Solution M / *Larutan M*	**Solution N / *Larutan N***
A	Hypotonic / *Hipotonik*	Hypertonic / *Hipertonik*
B	Hypertonic / *Hipertonik*	Hypotonic / *Hipotonik*
C	Hypertonic / *Hipertonik*	Isotonic / *Isotonik*
D	Hypotonic / *Hipotonik*	Isotonic / *Isotonik*

7 Diagram 5 is an experiment to show the movement of water through a membrane.
Rajah 5 adalah eksperimen yang menunjukkan pergerakan molekul merentasi membran.

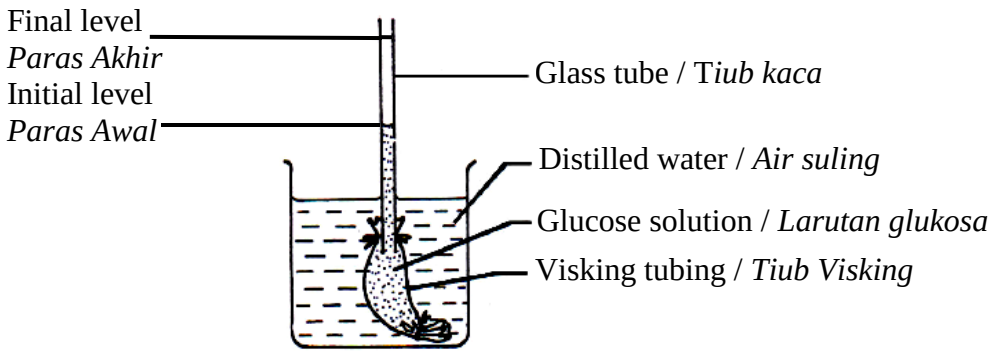


Diagram 5 / *Rajah 5*

Why does the water level in the glass tube rise?
Mengapakah paras air di dalam tiub kaca meningkat?

A Glucose solution flows out
Larutan glukosa meresap keluar.

B Water molecules diffused into the Visking tubing
Molekul air meresap ke dalam tiub Visking

C Air diffuses into the Visking tubing
Udara meresap ke dalam tiub Visking

D The atmospheric pressure causes the water level to rise.
Tekanan atmosfera menyebabkan paras air meningkat.

8 An experiment is carried out to show the effect of the concentration of sucrose solution to the mass of potato strips.
Potato strips were placed in 5 %, 15 % and 30 % sucrose solution. The initial mass of the potato strips is 1.40 g.
What is the final mass of the potato strip in 30 % sucrose solution?

Satu eksperimen telah dijalankan untuk menyiasat kesan kepekatan larutan sukrosa terhadap jisim jalur kentang.
Jalur kentang direndam ke dalam larutan sukrosa 5 %, 15 % dan 30 %. *Jisim awal jalur kentang ialah 1.40 g.*
Apakah jisim akhir jalur kentang di dalam larutan sukrosa 30 %?

A 1.14 g
B 1.40 g
C 1.58 g
D 1.79 g

9 The following equations shows the hydrolysis of four different types of carbohydrates.
Persamaan berikut menunjukkan hidrolisis empat jenis karbohidrat.

P : Maltose + water → glucose + glucose
P : Maltosa + air → glukosa + glukosa

Q : Galactose + water → glucose + lactose
Q : Galaktosa + air → glukosa + laktosa

R : Sucrose + water → glucose + fructose
R : Sukrosa + air → glukosa + fruktosa

S : Fructose + water → glucose + sucrose
S : Fruktosa + air → glukosa + sukrosa

Which equations are correct?
Persamaan manakah yang betul?

A P and Q / *P dan Q*

B R and S / *R dan S*

C Q and R / *Q dan R*

D P and R / *P dan R*

10 Diagram 6 shows the structure of a triglyceride.
Rajah 6 menunjukkan struktur satu trigliserida.

Diagram 6 / *Rajah 6*

What are represented by X and Y?

Apakah yang diwakili oleh X dan Y?

	X	Y
A	Glycerol / *Gliserol*	Fatty acid / *Asid lemak*
B	Fatty acid / *Asid lemak*	Phosphoric acid / *Asid fosforik*
C	Amino acid / *Asid amino*	Glycerol / *Gliserol*
D	Phosphate / *Fosfat*	Fatty acid / *Asid lemak*

11 Diagram 7 shows the the mechanism of an enzyme reaction.
Rajah 7 menunjukkan mekanisme tindak balas enzim.

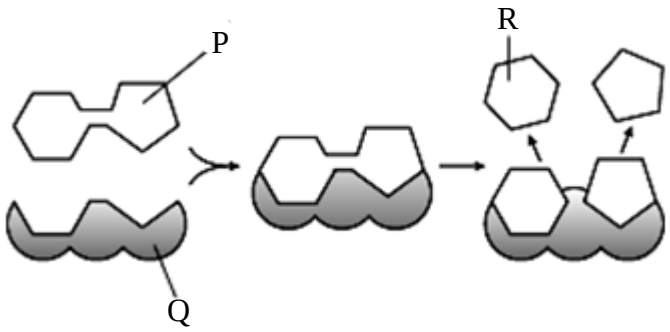


Diagram 7 / *Rajah 7*

Based of diagram above, which characteristics of enzyme is true?
Berdasarkan gambarajah di atas, ciri-ciri enzim yang manakah adalah benar?

I Enzyme is highly specific
Enzim adalah sangat spesifik
II Enzyme is not destroyed at the end of reaction
Enzim tidak dimusnahkan di akhir tindak balas
III Enzyme reaction is reversible
Tindakan enzim adalah berbalik
IV Enzyme are needed in small quantities
Enzim diperlukan dalam kuantiti yang sedikit

A I and II / *I dan II*
B I and III / *I dan III*
C II and IV / *II dan IV*
D III and IV / *III dan IV*

12 Diagram 8 shows the cell cycle.
Rajah 8 menunjukkan kitaran sel.

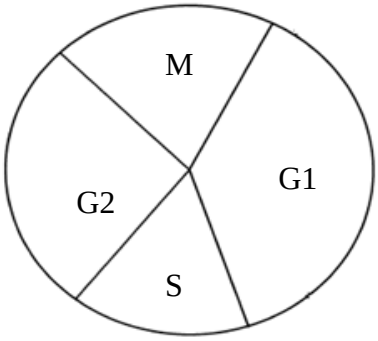


Diagram 8 / *Rajah 8*

Which of the following is correct about S phase?
Antara berikut yang manakah benar tentang fasa S?

A Replication of DNA / *Replikasi DNA*
B Synthesis of organelles / *Sintesis organel*
C Mitosis and cytokinesis / *Mitosis dan sitokinesis*
D Accumulation of energy / *Pengumpulan tenaga*

13 Diagram 9 shows a process that occurs during a phase in meiosis.
Rajah 9 menunjukkan suatu proses yang berlaku dalam satu peringkat meiosis.

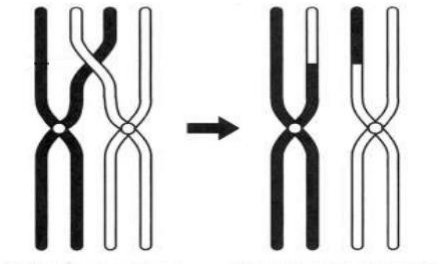


Diagram 9 / *Rajah 9*

In which part of a plant does this process takes place?
Pada bahagian tumbuhan yang manakah proses ini berlaku?

A Sepal / *Sepal*
B Stigma / *Stigma*
C Anther / *Anter*
D Filament / *Filamen*

  [*Lihat halaman sebelah*

14 Diagram 10 shows a cell in the skin of animal X undergoing mitosis.
Rajah 10 menunjukkan sel di bahagian kulit haiwan X yang sedang menjalani mitosis.

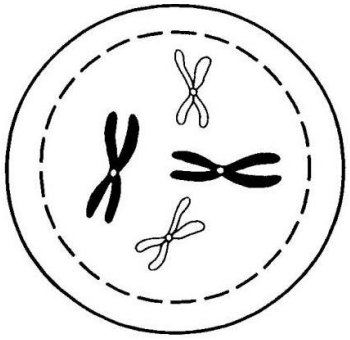
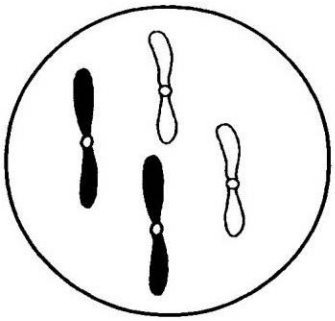


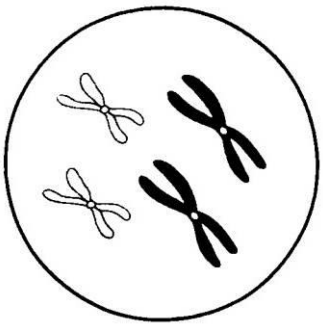
Diagram 10 / *Rajah 10*

Which of the following represents the daughter cell when mitosis is completed?
Antara berikut yang manakah mewakili sel anak setelah mitosis lengkap?

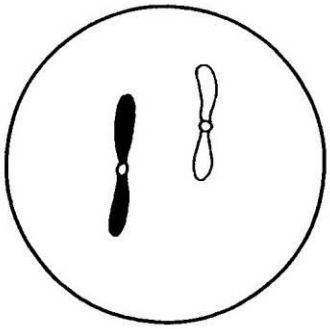
A



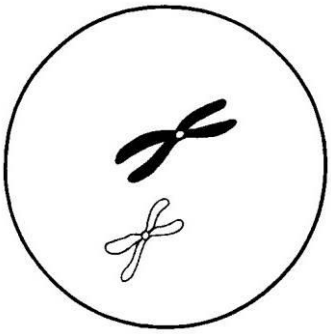
B



C



D



15 Diagram 11 shows a condition faced by a woman as she grows older.
Rajah 11 menunjukkan keadaan yang dialami oleh seorang wanita apabila dia semakin meningkat usia.

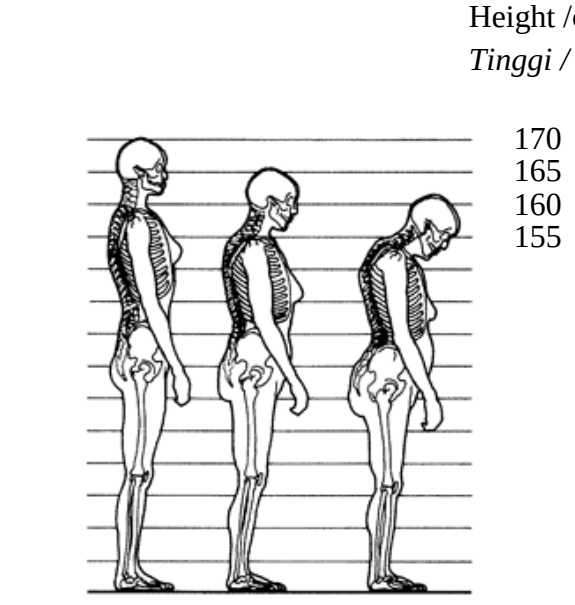


Diagram 11 / *Rajah 11*

Which nutrient should be consumed to prevent this condition?
Nutrien manakah perlu diambil untuk mencegah keadaan ini?

A Sodium and vitamin D / *Natrium dan vitamin D*
B Calcium and phosphorus / *Kalsium dan fosforus*
C Iodine and vitamin C / *Iodin dan vitamin C*
D Protein and vitamin A / *Protein dan vitamin A*

16 Diagram 12 shows the formation of gallstones in the gall bladder and bile duct.
Rajah 12 menunjukkan pembentukan batu hempedu dalam pundi hempedu dan duktus hempedu.

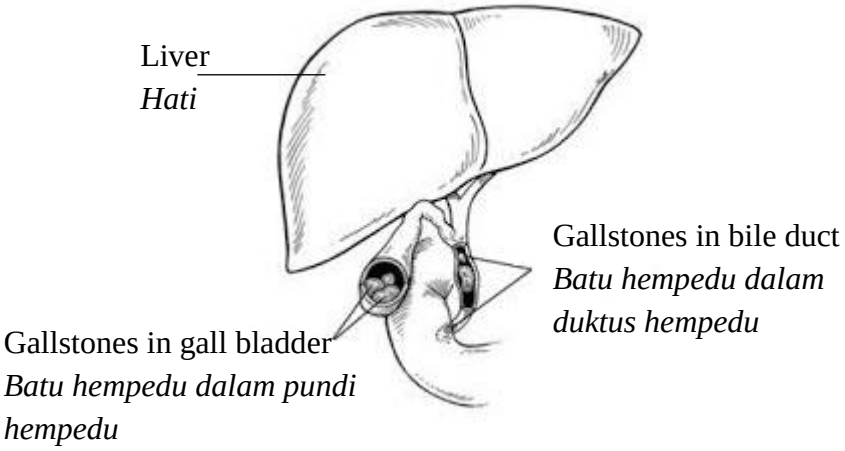


Diagram 12 / *Rajah 12*

What is the effect to the digestive system if the gall bladder and the bile duct are removed surgically?
Apakah kesan kepada sistem pencernaan jika pundi hempedu dan duktus hempedu dibuang secara pembedahan?

A Bile cannot be produced
Hempedu tidak dapat dihasilkan

B Fats cannot be emulsified
Lemak tidak dapat diemulsikan

C Protein cannot be digested efficiently
Protein tidak boleh dicernakan dengan cekap

D Assimilation of food cannot be carried out
Asimilasi makanan tidak dapat berlaku

17 The following statements describe the effect of a mineral deficiency in plant.
Pernyataan berikut menerangkan kesan kekurangan satu mineral pada tumbuhan.

- Leaves turn yellow (chlorosis) / *Daun menjadi kuning (klorosis)*
- Stunted growth / *Pertumbuhan terbantut*
- Retarded buds / *Kematian tunas*

What is the mineral?
Apakah mineral tersebut?

A Magnesium / *Magnesium*

B Phosphorus / *Fosforus*

C Nitrogen / *Nitrogen*

D Sulphur / *Sulfur*

18 The chemical equation below shows one of the reactions that occurs during photosynthesis.
Persamaan kimia di bawah menunjukkan salah satu daripada tindak balas yang berlaku semasa fotosintesis.

$$24H_2O \xrightarrow[\text{Chlorophyll/}\textit{Klorofil}]{\text{Light/}\textit{Cahaya}} 24H^+ + 24OH^-$$

Which of the following will happen if the light intensity is low?
Antara yang berikut, yang manakah akan berlaku jika keamatan cahaya adalah rendah?

I More oxygen is produced
Lebih banyak oksigen dihasilkan

II Photolysis of water increases
Fotolisis air meningkat

III Less hydrogen atoms are produced
Kurang atom hidrogen dihasilkan

IV Fixation of carbon dioxide is reduced
Pengikatan karbon dioksida berkurangan

A I and II / *I dan II*

B I and III / *I dan III*

C II and IV / *II dan IV*

D III and IV / *III dan IV*

  [*Lihat halaman sebelah*

19 Diagram 13 shows a cross-section of an alveolus and blood capillary.
Rajah 13 menunjukkan keratan rentas bagi alveolus dan kapilari darah.

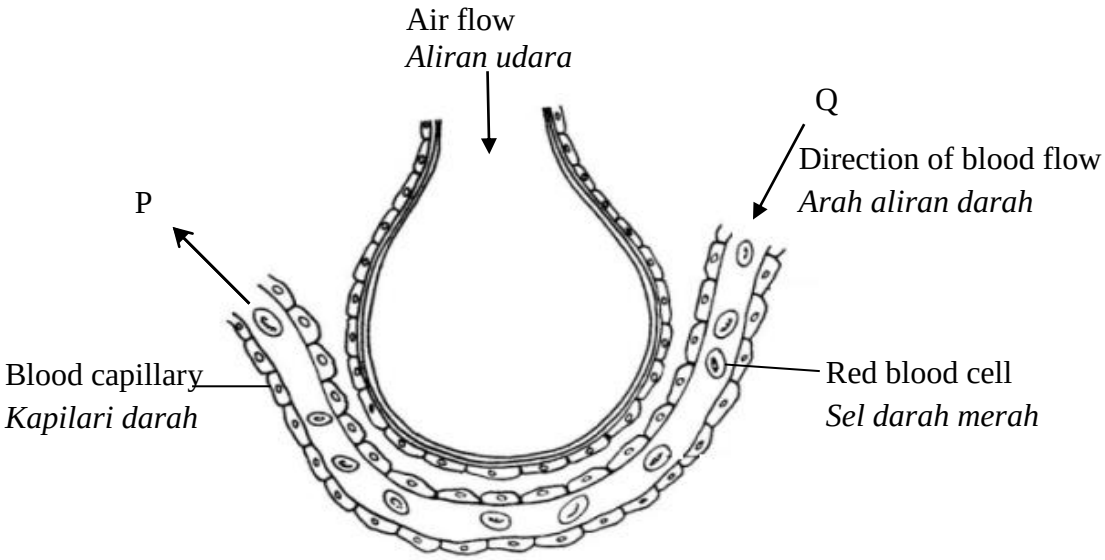


Diagram 13 / *Rajah 13*

What is the partial pressure of oxygen at P and Q?
Apakah tekanan separa oksigen pada P dan Q?

	P	**Q**
A	Low / *Rendah*	High / *Tinggi*
B	High / *Tinggi*	Low / *Rendah*
C	Low / *Rendah*	Low / *Rendah*
D	High / *Tinggi*	High / *Tinggi*

20 Diagram 14 shows an experiment to study respiration in yeast.
Rajah 14 menunjukkan satu eksperimen untuk mengkaji respirasi dalam yis.

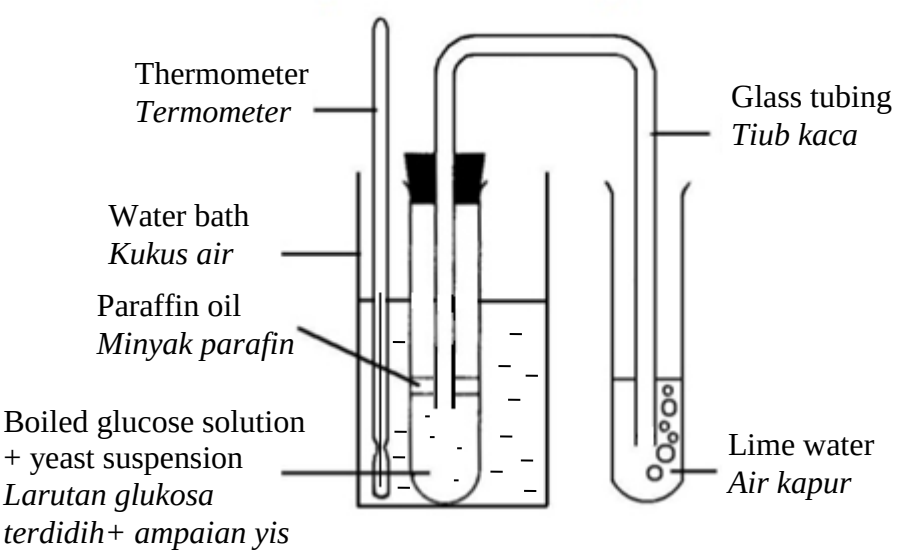


Diagram 14 / *Rajah 14*

Which of the following equations represents the reaction that occurs?
Antara persamaan berikut, yang manakah mewakili tindak balas kimia yang berlaku?

A Glucose + oxygen → carbon dioxide + water + energy
Glukosa + oksigen → karbon dioksida + air + tenaga

B Glucose → carbon dioxide + water + energy
Glukosa → karbon dioksida + air + tenaga

C Glucose → carbon dioxide + ethanol + energy
Glukosa → karbon dioksida + etanol + tenaga

D Glucose → lactic acid + water + energy
Glukosa → asid laktik + air + tenaga

21 Diagram 15 shows part of the human respiratory system.
Rajah 15 menunjukkan sebahagian daripada sistem respirasi manusia.

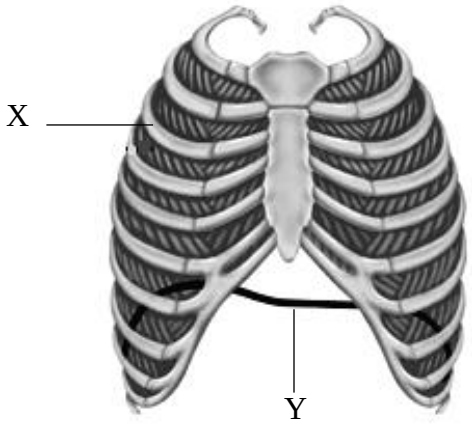


Diagram 15 / *Rajah 15*

What happen to structures X and Y during exhalation?
Apakah yang berlaku kepada struktur X dan Y semasa menghembus nafas?

	X	**Y**
A	Move downwards and inwards *Bergerak ke bawah dan ke dalam*	Relaxes *Mengendur*
B	Moves upwards and outwards *Bergerak ke atas dan ke luar*	Relaxes *Mengendur*
C	Move downwards and inwards *Bergerak ke bawah dan ke dalam*	Contracts *Mengecut*
D	Moves upwards and outwards *Bergerak ke atas dan ke luar*	Contracts *Mengecut*

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

A Both require oxygen
Kedua-duanya memerlukan oksigen
B Both occurs in all living cells
Kedua-duanya berlaku dalam semua sel hidup
C Both produce water
Kedua-duanya menghasilkan air
D Both produce energy
Kedua-duanya menghasilkan tenaga

23 Which of the following pair of organisms shows commensalism interaction?
Antara pasangan organisma yang berikut, yang manakah menunjukkan interaksi komensalisme?

A Rhizobium and legume
Rhizobium dan legum
B Remora and shark
Ikan remora dan ikan yu
C Tapeworm and human
Cacing pita dan manusia
D Sea anemone and hermit crab
Anemon laut dan ketam hermit

24 Diagram 16 shows a process of colonisation and succession in a pond.
Rajah 16 menunjukkan proses pengkolonian dan sesaran dalam sebuah kolam.

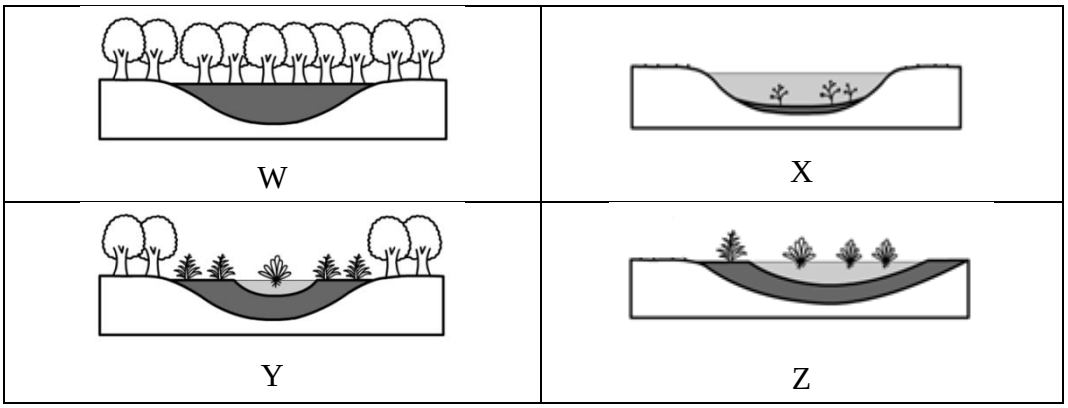


Diagram 16 / *Rajah 16*

What is the correct sequence?
Apakah urutan yang betul?

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

25 Table 1 shows the result of a study on the population of snails in a garden.
Jadual 1 menunjukkan keputusan satu kajian ke atas populasi siput dalam satu kebun.

Visit ***Lawatan***	**Number of snails** ***Bilangan siput***	
	Marked ***Bertanda***	**Unmarked** ***Tidak bertanda***
First *Pertama*	100	-
Second *Kedua*	20	40

Table 1 /*Jadual 1*

What is the estimated population size of the snails?
Apakah anggaran saiz populasi siput?

A 10
B 50
C 200
D 300

26 Which of the following organisms is involved in the process of making compost?
Antara organisma-organisma berikut, yang manakah terlibat dalam proses membuat kompos?

A Algae / *Alga*
B Virus / *Virus*
C Protozoa / *Protozoa*
D Bacteria / *Bakteria*

  [*Lihat halaman sebelah*

27 Diagram 17 is a graph which shows the Air Pollution Index (API) in an area.
Rajah 17 ialah satu graf yang menunjukkan Indeks Pencemaran Udara (IPU) dalam satu kawasan.

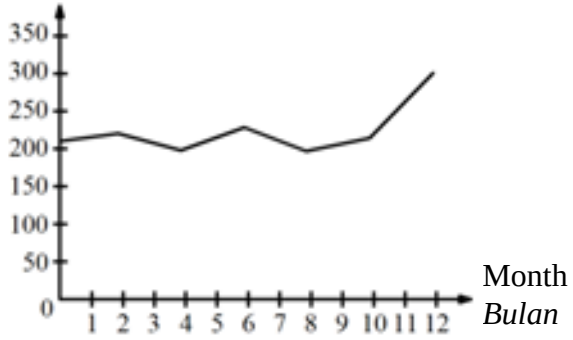


Diagram 17 / *Rajah 17*

What is the human activity that contributes to the increases of Air Pollution Index reading?
Apakah aktiviti manusia yang menyumbang kepada peningkatan Indeks Pencemaran Udara?

A Dumping of domestic material
Pembuangan bahan domestik
B Open burning
Pembakaran terbuka
C Releasing of chloroflurocarbon
P*embebasan kloroflorokarbon*
D Dumping of radioactive waste
Pembuangan sisa radioaktif

28 What is effect of thermal pollution?
Apakah kesan pencemaran terma?

A Soil erosion
H*akisan tanah*
B Deforestation
Penyahutanan
C Thinning of ozone layer
P*enipisan lapisan ozon*
D Rapid growth of algae
P*ertumbuhan alga yang pesat*

29 The following steps were carried out to investigate the water pollution level in a river.
Langkah-langkah yang berikut dijalankan untuk mengkaji tahap pencemaran air dalam sebatang sungai.

P	- Record the time taken for the methylene blue solution to decolourise *Catatkan masa diambil untuk pelunturan warna larutan metilena biru*
Q	- Fill the reagent bottles with water samples *Isi botol reagen dengan sampel air*
R	- Place the reagent bottles inside a cupboard *Simpan botol reagen di dalam sebuah almari*
S	- Use a syringe to add 1 mℓ of methylene blue solution *Gunakan picagari untuk memasukkan 1 mℓ larutan metilena biru*

Which of the following is the correct sequence to investigate the water pollution level.
Antara yang berikut, yang manakah urutan yang betul untuk mengkaji tahap pencemaran air?

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

30 Diagram 18 shows an open circulatory system of an insect.
Rajah 18 menunjukkan sistem peredaran terbuka seekor serangga.

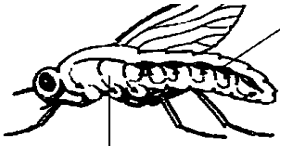


Diagram 18 / *Rajah 18*

What is the colourless fluid inside X?
Apakah cecair tidak berwarna yang terdapat dalam X?

A Lymph / *Bendalir limfa*
B Hemolymph / *Hemolimfa*
C Blood plasma / *Plasma darah*
D Tissue fluid / *Bendalir tisu*