



**KEMENTERIAN
PENDIDIKAN
MALAYSIA**

**BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH
DAN SEKOLAH KECEMERLANGAN**

**PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2015
PERCUBAAN SIJIL PELAJARAN MALAYSIA**

BIOLOGI

Kertas 1

1 jam 15 minit

JANGAN BUKA KERTAS SOALANINI SEHINGGA DIBERITAHU

Arahan:

1. Kertas soalan ini adalah dalam dwibahasa.
2. Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.
3. Kertas soalan ini mengandungi **50 soalan**.
4. Jawab **semua** soalan.
5. Jawab setiap soalan dengan menghitamkan ruangan yang **betul** dalam helaian jawapan.
6. Hitamkan **satu** ruangan sahaja bagi setiap soalan.
7. Sekiranya anda ingin mengubah jawapan anda, padamkan tanda hitam yang telah dibuat. Kemudian hitamkan ruangan untuk jawapan baharu.
8. Rajah yang diberikan dalam soalan tidak dilukiskan mengikut skala melainkan diberitahu.
9. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

Kertas soalan ini mengandungi **28** halaman bercetak.

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

- 1** The following statements are characteristics of a cell structure.
Pernyataan berikut adalah ciri-ciri suatu struktur sel.

- Permeable to all fluids
Telap kepada semua cecair
- Rigid and not elastic
Tegar dan tidak kenyal

Which structure has these characteristics?
Struktur manakah yang mempunyai ciri-ciri ini?

- | | |
|------------------------------------------------|----------------------------------------------------|
| A Vacuole
<i>Vakuol</i> | B Cell wall
<i>Dinding sel</i> |
| C Golgi apparatus
<i>Jasad golgi</i> | D Plasma membrane
<i>Membrane plasma</i> |

- 2** Diagram 1 shows a part of human digestive system.
Rajah 1 menunjukkan sebahagian daripada sistem pencernaan manusia.

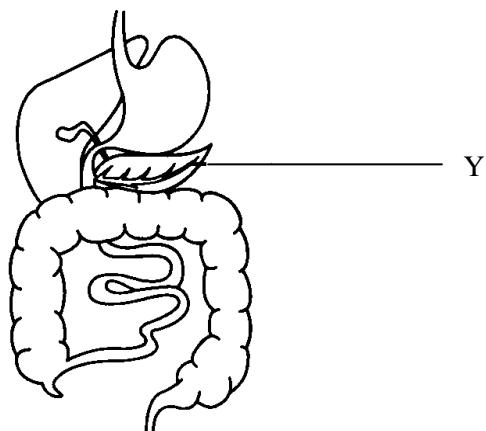


Diagram 1
Rajah 1

Which organelle can be found in large number in organ Y?
Organel manakah yang terdapat dengan banyak di dalam organ Y?

- | | |
|--------------------------------------------------------------------------|-------------------------------------------------------------------------|
| A Mitochondrion
<i>Mitokondria</i> | B Lysosome
<i>Lisosom</i> |
| C Smooth endoplasmic reticulum
<i>Jalinan endoplasma licin</i> | D Rough endoplasmic reticulum
<i>Jalinan endoplasma kasar</i> |

- 3** Diagram 2 shows the structure of plant cells when immersed in a sugar solution.
Rajah 2 menunjukkan struktur sel tumbuhan apabila direndam di dalam larutan gula.

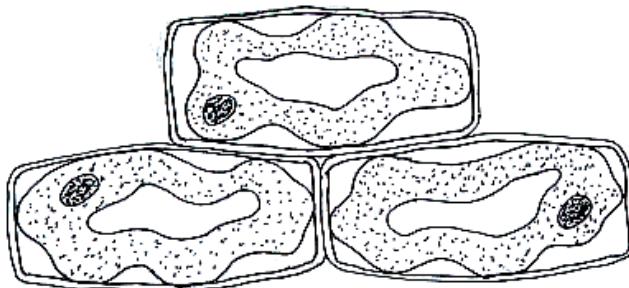


Diagram 2
Rajah 2

Which of the following is **true** about the process and the condition of the cells?
Antara berikut yang manakah adalah benar tentang proses dan keadaan sel itu?

	Process Proses	Condition of the cell Keadaan sel
A	Plasmolysis <i>Plasmolysis</i>	Turgid <i>Segah</i>
B	Plasmolysis <i>Plasmolysis</i>	Flaccid <i>Flasid</i>
C	Deplasmolysis <i>Deplasmolisis</i>	Turgid <i>Segah</i>
D	Deplasmolysis <i>deplasmolisis</i>	Flaccid <i>Flasid</i>

- 4** Diagram 3 shows the movement of molecule X across the plasma membrane through process Y.
Rajah 3 menunjukkan pergerakan molekul X merentasi membran plasma melalui proses Y.

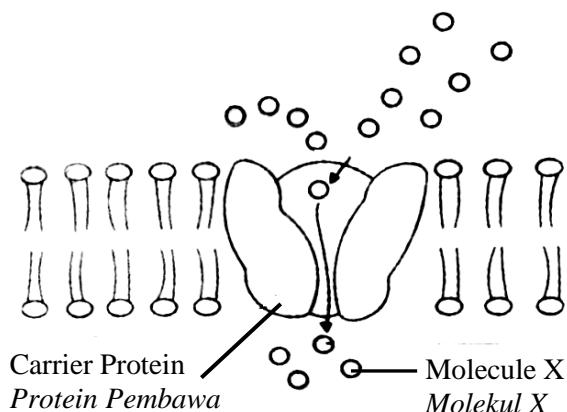


Diagram 3
Rajah 3

What is process Y?
Apakah proses Y?

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

- 5 Diagram 4 shows the proses involved in the preservation of cucumber. The cucumbers were immersed in solution X for 3 months.

Rajah 4 menunjukkan proses yang digunakan dalam pengawetan buah timun. Buah-buah timun direndam dalam larutan X selama 3 bulan.

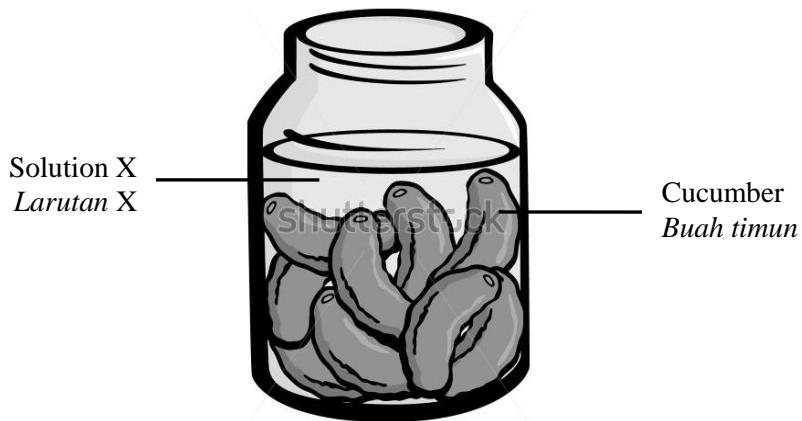
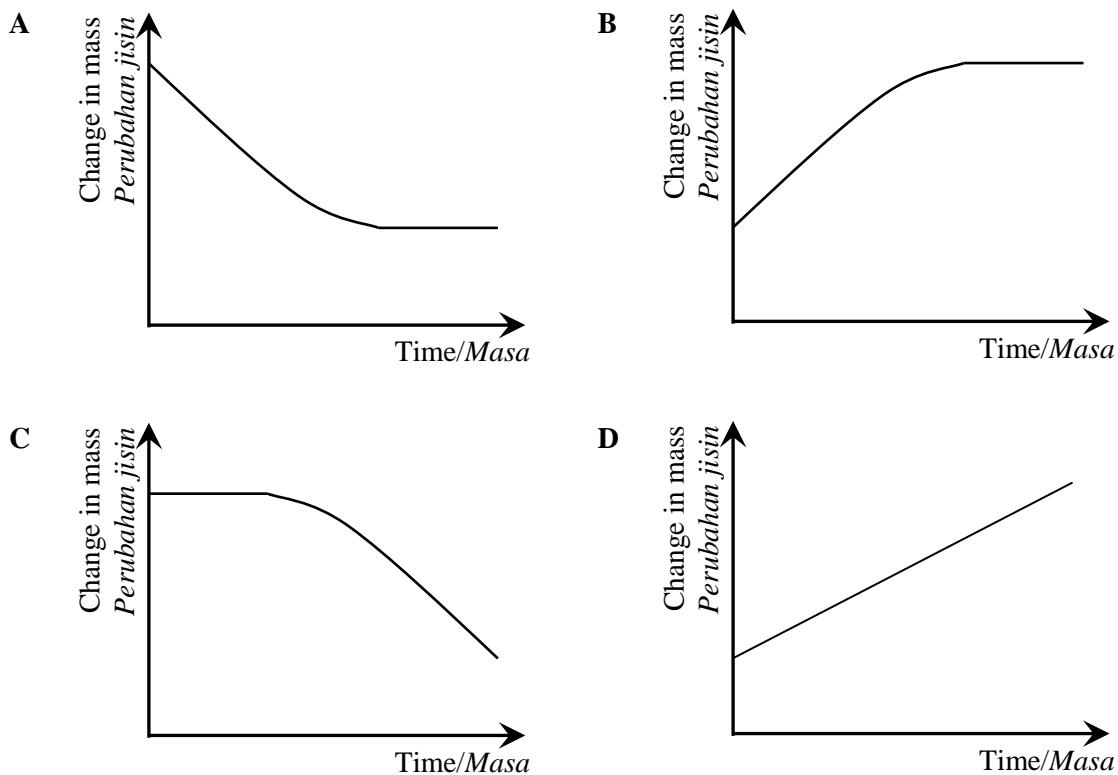


Diagram 4
Rajah 4

Which graph shows how the mass of cucumber changes during the process?
Graf manakah menunjukkan bagaimana jisim timun berubah semasa proses itu?



6

A vegetable seller found out his leafy vegetables wilt when left for half a day.

Penjual sayur mendapati sayur-sayurannya layu apabila ditinggalkan separuh hari.

What is the best way to refresh the vegetables?

Apakah kaedah terbaik untuk menjadikan sayur-sayuran segar semula?

- A Immerse the vegetables in tap water
Rendam sayuran di dalam air paip
- B Immerse the vegetables in salt water
Rendam sayuran di dalam air masin
- C Keep the vegetables in a transparent plastic bag
Simpan sayuran di dalam beg plastik lutsinar
- D Keep the vegetables in the refrigerator
Simpan sayuran di dalam peti sejuk

7 What is the process involved in breaking down a dipeptide chain into amino acids?

Apakah proses yang terlibat dalam pemecahan rantai dipeptida kepada asid amino?

- | | |
|-------------------------------------------|-----------------------------------|
| A Condensation
<i>Kondensasi</i> | B Heating
<i>Pemanasan</i> |
| C Acid addition
<i>Penambahan asid</i> | D Hydrolysis
<i>Hidrolisis</i> |

8 Diagram 5 show a nucleotide molecule of DNA.

Rajah 5 menunjukkan satu molekul nukleotida dalam DNA.

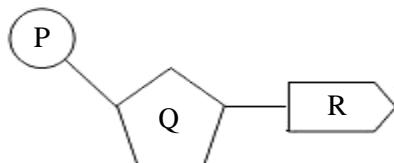


Diagram 5
Rajah 5

What are P,Q and R?

Apakah P , Q dan R ?

	P	Q	R
A	Pentose sugar <i>Gula Pentosa</i>	Nitrogenous base <i>Bes bernitrogen</i>	Phosphate group <i>Kumpulan fosfat</i>
B	Nitrogenous base <i>Bes bernitrogen</i>	Phosphate group <i>Kumpulan fosfat</i>	Pentose sugar <i>Gula Pentosa</i>
C	Phosphate group <i>Kumpulan fosfat</i>	Pentose sugar <i>Gula Pentosa</i>	Nitrogenous base <i>Bes bernitrogen</i>
D	Pentose sugar <i>Gula Pentosa</i>	Phosphate group <i>Kumpulan fosfat</i>	Nitrogenous base <i>Bes bernitrogen</i>

9 Diagram 6 shows one type of protein structure.

Which of the following is an example of the structure?

Rajah 6 menunjukkan satu jenis struktur protein.

Yang manakah antara berikut adalah contoh untuk struktur itu.

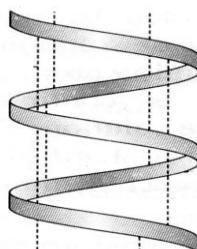


Diagram 6

Rajah 6

A Hormone
Hormon

B Silk
Sutera

C Enzyme
Enzim

D Haemoglobin
Haemoglobin

10 At which stage in a meiotic division the number of chromosomes in the cell begin to half?

Dalam peringkat pembahagian metosis yang manakah bilangan kromosom dalam sel mula diseparuahkan?

A Anaphase I
Anaphase I

B Anaphase II
Anaphase II

C Telophase I
Telophase I

D Telophase II
Telophase II

11 Diagram 7 shows an animal cell undergoing meiosis I.

Rajah 7 menunjukkan satu sel haiwan sedang mengalami meiosis I.

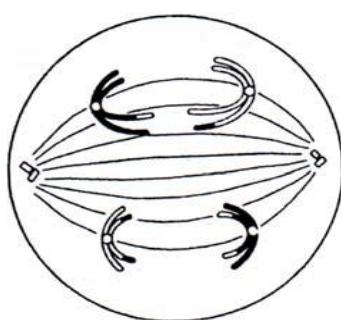


Diagram 7

Rajah 7

How many chromosomes are there in the gamete of this animal?

Berapakah bilangan kromosom dalam gamet haiwan ini?

A 2

B 4

C 6

D 8

- 12** Diagram 8 shows three stages of meiosis.

Rajah 8 menunjukkan tiga peringkat meiosis.

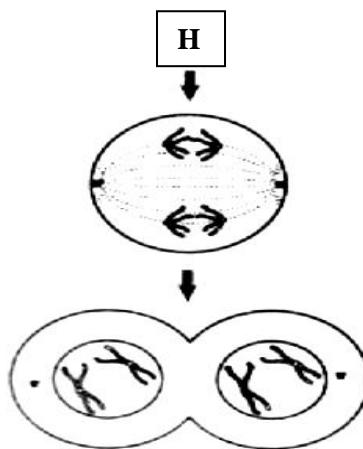


Diagram 8
Rajah 8

Which of the following describes the chromosomes in stage H?

Yang manakah antara berikut memperihalkan kromosom dalam peringkat H?

- A** The chromosomes become shorter and thicker
Kromosom memendek dan menebal
- B** Homologous chromosomes pair up and crossing over takes place
Kromosom homolog berpasangan dan pindah silang berlaku
- C** Homologous chromosomes separate and move to the opposite poles
Kromosom homolog berpisah dan bergerak ke kutub bertentangan
- D** Homologous chromosomes arrange themselves in one line between the two cell poles
Kromosom homolog menyusun dalam satu barisan di antara dua kutub sel

- 13** Diagram 9 shows the structure of a chloroplast seen under an electron microscope.

Rajah 9 menunjukkan struktur kloroplas yang dilihat di bawah mikroskop elektron.

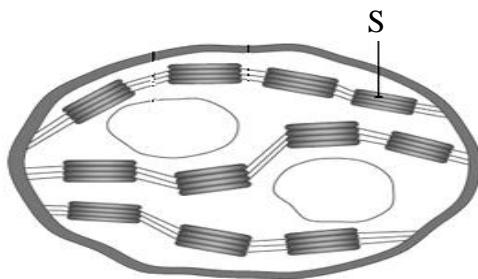


Diagram 9
Rajah 9

Name the process that occurs in S.

Namakan proses yang berlaku di S.

- | | |
|--------------------------------------------------------------------------|-------------------------------------------------------|
| A Reduction of carbon dioxide
<i>Penurunan karbon dioksida</i> | B Photolysis of water
<i>Fotolisis air</i> |
| C Synthesis of glucose
<i>Sintesis glukosa</i> | D Synthesis of starch
<i>Sintesis kanji</i> |

- 14** Diagram 10 shows the human digestive system.
Rajah 10 menunjukkan sistem pencernaan manusia

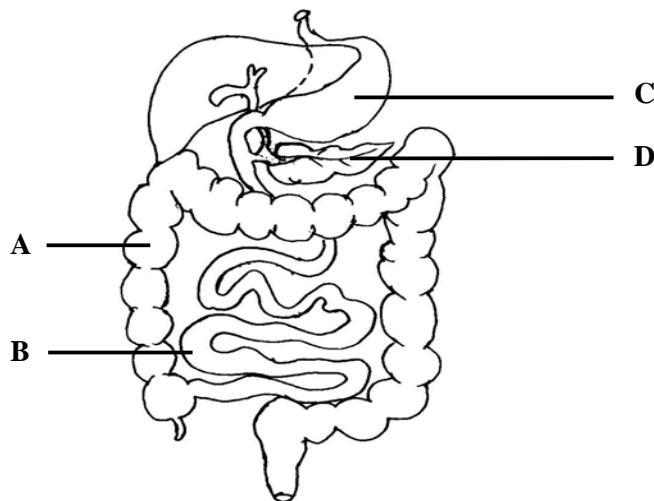


Diagram 10
Rajah 10

Which of the following organs **A**, **B**, **C** or **D** secretes hydrochloric acid?
*Antara organ **A**, **B**, **C** atau **D** berikut yang manakah merembeskan asid hidroklorik?*

- 15** Diagram 11 shows a section of a leaf.
Rajah 11 menunjukkan keratan sehelai daun.

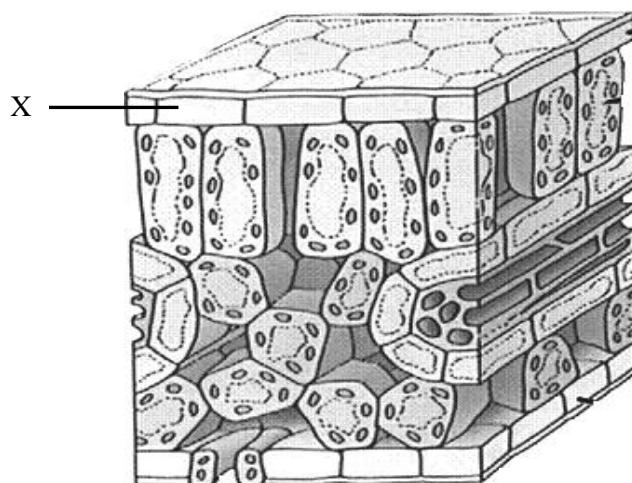


Diagram 11
Rajah 11

What is the adaptation of the structure X to optimize photosynthesis?
Apakah penyesuaian yang terdapat pada struktur X untuk mengoptimalkan fotosintesis?

- | | | | |
|----------|----------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------------------------|
| A | Have a lot of chloroplast
<i>Mempunyai banyak kloroplas</i> | B | Large air spaces between cell
<i>Ruang udara yang besar antara sel</i> |
| C | Transparent layer of the surface
<i>Lapisan permukaan yang lutsinar</i> | D | Cylindrical cell arranged in long row
<i>Sel berbentuk silinder tersusun dalam barisan panjang</i> |

- 16** Diagram 12 shows the structure of a villus in the ileum.
Rajah 12 menunjukkan struktur vilus dalam ileum.

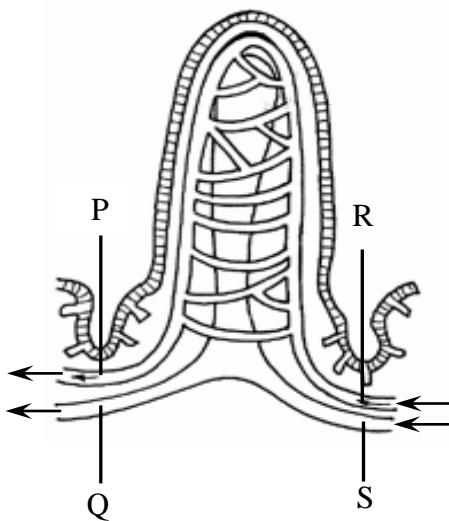


Diagram 12
Rajah 12

Which of the following carry large amounts of glucose and fat-soluble vitamins?
Salur yang manakah membawa banyak glukosa dan vitamin larut dalam lemak?

	Glucose <i>Glukosa</i>	Fat soluble vitamins <i>Vitamin larut dalam lemak</i>
A	P	Q
B	Q	P
C	R	S
D	S	R

- 17** When 0.4 g of groundnut is completely burnt, the temperature of 20 ml of water rises from 30°C to 70°C. The specific heat capacity of water is 4.2 Jg°C. Calculate the energy value of the groundnut.

Apabila 0.4g kacang tanah dibakar dengan lengkap, suhu 20 ml air meningkat dari 30°C kepada 70°C. Muatan Haba Tentu air ialah 4.2 Jg °C.

Hitung nilai tenaga bagi kacang tanah.

- | | |
|--------------------------|--------------------------|
| A 1400 Jg^{-1} | B 3400 Jg^{-1} |
| C 8400 Jg^{-1} | D 7620 Jg^{-1} |

- 18** Diagram 13 shows an experiment to study the effect of light intensity on the rate of photosynthesis. The number of air bubbles released represents the rate of photosynthesis.

Rajah 13 menunjukkan eksperimen yang mengkaji kesan keamatan cahaya ke atas kadar fotosintesis. Bilangan gelembung udara yang dibebaskan mewakili kadar fotosintesis.

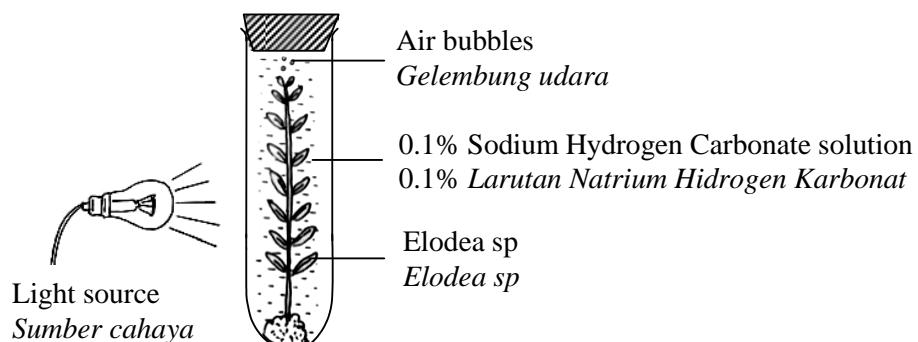
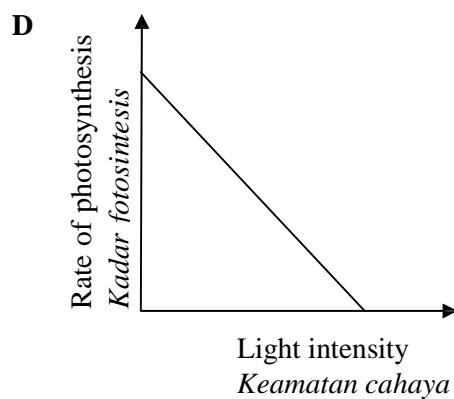
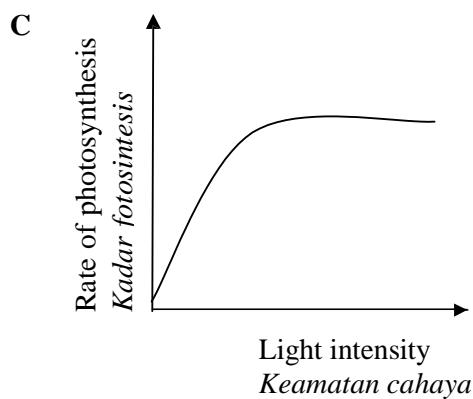
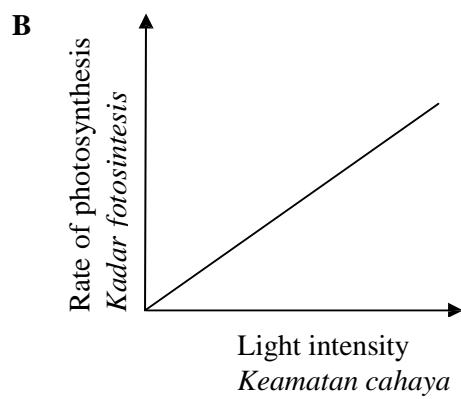
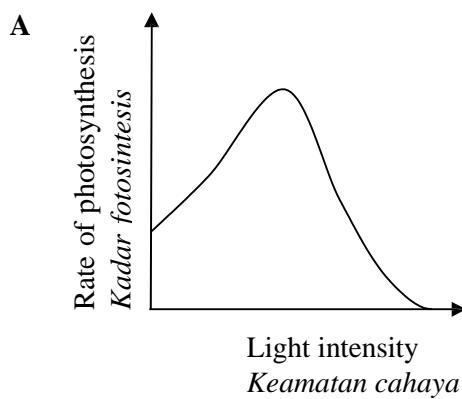


Diagram 13
Rajah 13

Which of the following graph shows the result of the experiment?

Antara graf yang berikut yang manakah menunjukkan keputusan eksperimen?



- 19** Which is one of the end products of anaerobic respiration in yeast?
Yang manakah adalah salah satu produk akhir bagi respirasi anaerobik pada yis?

- | | |
|--------------------------------------------|-----------------------------------|
| A Lactic acid
<i>Asid laktik</i> | B Ethanol
<i>Etanol</i> |
| C 38 ATP
<i>38 ATP</i> | D Water
<i>Air</i> |

- 20** Diagram 14 shows a living organism.
Rajah 14 menunjukkan sejenis organisma hidup.



Diagram 14
Rajah 14

Which of the following is true about the pathway of carbon dioxide in the organism?
Antara berikut yang mana benar tentang urutan laluan karbon dioksida dalam organisma itu?

- | | | |
|----------|------------------------------------------|---------------------------------------------------------------|
| A | Spiracles → trachea → tracheoles → cells | <i>Spirakel</i> → <i>trakea</i> → <i>trakeol</i> → <i>sel</i> |
| B | Cells → tracheoles → spiracles → trachea | <i>Sel</i> → <i>trakeol</i> → <i>spirakel</i> → <i>trakea</i> |
| C | Spiracles → tracheoles → trachea → cells | <i>Spirakel</i> → <i>trakeol</i> → <i>trakea</i> → <i>sel</i> |
| D | Cells → tracheoles → trachea → spiracles | <i>Sel</i> → <i>trakeol</i> → <i>trakea</i> → <i>spirakel</i> |

21 Diagram 15 shows the negative feedback in human body system.

X is responsible for detecting the increase in the concentration of carbon dioxide.

Rajah 15 menunjukkan mekanisme suap balik negatif dalam sistem badan manusia. X bertanggungjawab untuk mengesan pertambahan kepekatan karbon dioksida.

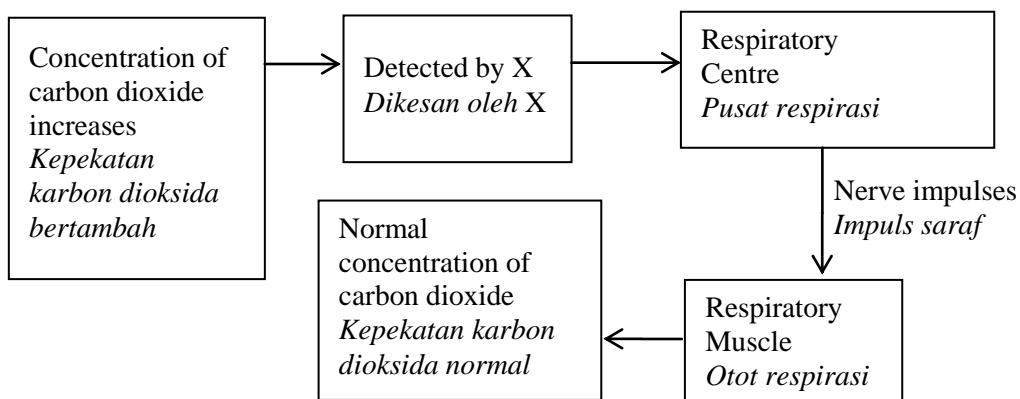


Diagram 15

Rajah 15

Which of the parts labelled **A**, **B**, **C** or **D** in Diagram 16 is X?

*Antara bahagian berlabel **A**, **B**, **C** atau **D** dalam Rajah 16 yang manakah X?*

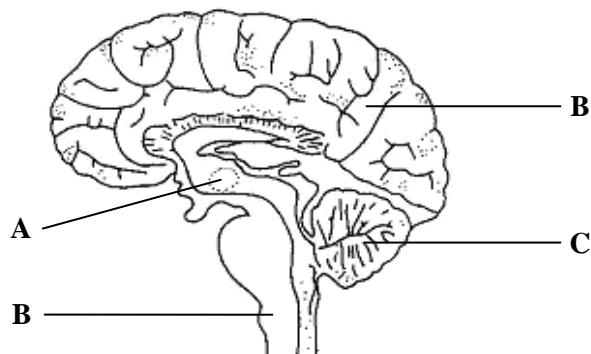


Diagram 16

Rajah 16

- 22** Diagram 17 shows the number of deaths in three different situation.

Rajah 17 menunjukkan bilangan kematian yang berlaku dalam tiga situasi yang berbeza.

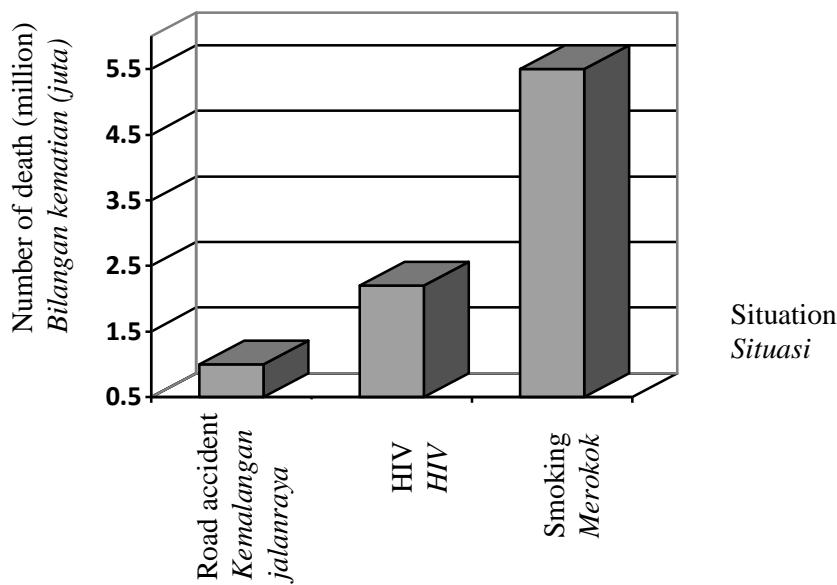


Diagram 17

Rajah 17

What are the harmful effects of smoking that caused the highest number of deaths?

Apakah kesan berbahaya merokok sehingga menyebabkan bilangan kematian paling tinggi?

- I Increases the risk of heart attacks and stroke.
Meningkatkan risiko serangan jantung dan angin.
 - II High risk of lung disease by damaging airways and the alveoli.
Menyebabkan penyakit paru-paru dengan merosakkan laluan udara dan alveolus.
 - III Higher risk of getting diabetes mellitus.
Berisiko tinggi mendapat penyakit kencing manis.
 - IV Higher risk of getting lung cancer
Berisiko tinggi mendapat kanser paru-paru.
- | | | | |
|----------|---------------------------------------|----------|-----------------------------------------------|
| A | I, II and III
I, II <i>dan</i> III | B | I, II and IV
I, II <i>dan</i> IV |
| C | I, III and IV
I, III <i>dan</i> IV | D | I, II, III and IV
I, II, III <i>dan</i> IV |

- 23** Diagram 18 shows an interaction between two organisms, R and S of different species.
Rajah 18 menunjukkan interaksi di antara dua organisme, R dan S yang berlainan spesies

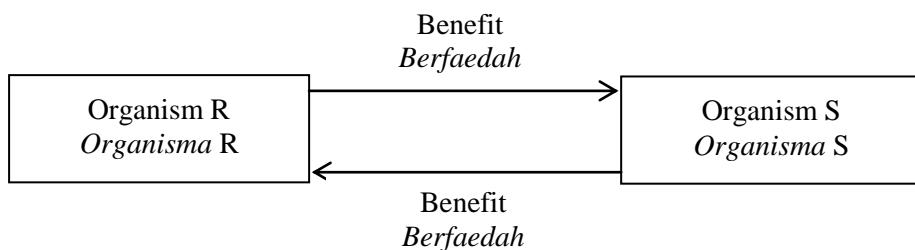


Diagram 18
Rajah 18

Which of the following represent organism R and organism S?
Antara berikut yang manakah mewakili organisme R dan S?

	R	S
A	Owl <i>Burung Hantu</i>	Rat <i>Tikus</i>
B	Shark <i>Jerung</i>	Remora fish <i>Ikan remora</i>
C	Alga <i>Alga</i>	Fungus <i>Kulat</i>
D	Crab <i>Ketam</i>	Barnacles <i>Teritip</i>

- 24** Diagram 19 shows parts of nitrogen cycle in the atmosphere.
Rajah 19 menunjukkan sebahagian kitar nitrogen di atmosfera

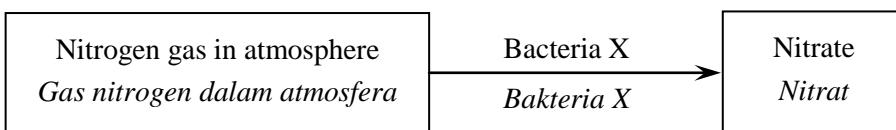


Diagram 19
Rajah 19

What is bacteria X?
Apakah bakteria X?

- | | | | |
|----------|---------------------------------------------------------------|----------|---------------------------------------------------|
| A | Nitrogen-fixing bacteria
<i>Bakteria pengikat nitrogen</i> | B | Nitrifying bacteria
<i>Bakteria penitritan</i> |
| C | Denitrifying bacteria
<i>Bakteria pendenitratan</i> | D | Purifying bacteria
<i>Bakteria pengurai</i> |

- 25** Table 1 shows the data obtained from an experiment to study the population of snails in an area.
Jadual 1 menunjukkan data yang diperoleh daripada eksperimen untuk mengkaji populasi siput dalam suatu kawasan.

Number of snails in the first capture <i>Bilangan siput dalam tangkapan pertama</i>	Number of snails in the second capture <i>Bilangan siput dalam tangkapan kedua</i>	
	Number of unmarked snails in the second capture <i>Bilangan siput yang tidak bertanda dalam tangkapan kedua</i>	Number of marked snails in the second capture <i>Bilangan siput yang bertanda dalam tangkapan kedua</i>
60	53	15

Table 1
Jadual 1

Estimate the size of population of snails in an area.
Anggarkan saiz populasi siput di kawasan tersebut.

A 13.2

B 17

C 272

D 362

- 26** Diagram 20 shows a food web in an ecosystem
Rajah 20 menunjukkan siratan makanan dalam suatu ekosistem

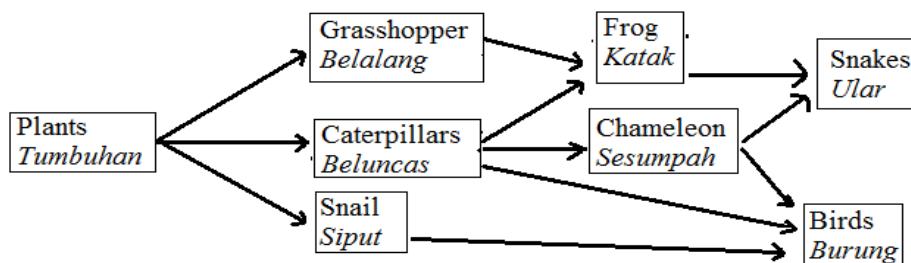


Diagram 20
Rajah 20

Which of the following statements about the food web in Diagram 21 are true?
Antara berikut manakah pernyataan tentang siratan makanan dalam Rajah 21 adalah benar?

- I Snails received more energy compared to birds
Siput menerima lebih tenaga berbanding dengan burung
- II If the number of grasshopper increases, the number of snakes also increases
Jika bilangan belalang bertambah, maka bilangan ular juga bertambah
- III If the number of birds decreases, the number of frog and caterpillars also decreases
Jika bilangan burung berkurang, maka bilangan katak dan beluncas juga berkurang
- IV The total number of food chain in food web in diagram is 6
Jumlah rantai makanan dalam siratan makanan dalam rajah di atas adalah 6

A I, II and III
I, II dan III

B I, II and IV
I, II dan IV

C I, III and IV
I, III dan IV

D II, III and IV
II, III dan IV

- 27** Diagram 21 shows an environmental phenomenon
Rajah 21 menunjukkan satu fenomena alam sekitar.

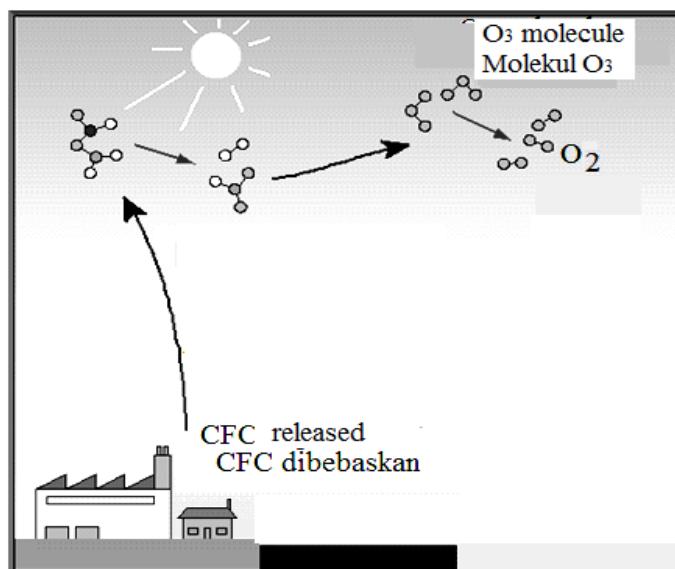


Diagram 21
Rajah 21

Which of the following represents the phenomenon?
Antara berikut manakah mewakili fenomena tersebut?

- | | |
|----------------------------------------------------|--------------------------------------------------------------------|
| A Global warming
<i>Pemanasan global</i> | B Greenhouse effect
<i>Kesan rumah hijau</i> |
| C Acid rain
<i>Hujan asid</i> | D Depletion of ozone layer
<i>Penipisan lapisan ozon</i> |

- 28** Which of the following is correctly matched ?
Antara berikut manakah padanan yang betul ?

	Unplanned development <i>Pembangunan tidak terancang</i>	Impact <i>Kesan</i>
A	Excessive use of inorganic fertilizers <i>Penggunaan baja bukan organik yang berlebihan</i>	Eutrophication <i>Eutrofikasi</i>
B	Glass building <i>Bangunan berkaca</i>	Air pollution <i>Pencemaran udara</i>
C	Excessive mining <i>Perlombongan berlebihan</i>	Greenhouse effect <i>Kesan rumah hijau</i>
D	Dumping of domestic waste <i>Pembuangan bahan buangan domestik</i>	Soil erosion <i>Hakisan tanah</i>

- 29** Diagram 22 shows the emission of various gases by a chemical factory in an industrial area.
Rajah 22 menunjukkan pembebasan pelbagai jenis gas dari kilang kimia dalam suatu kawasan perindustrian.



Diagram 22
Rajah 22

Which of the following is the effect of this activity?

Antara yang berikut, manakah merupakan kesan daripada aktiviti ini?

- | | |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| A Reduce BOD value of water
<i>Mengurangkan nilai BOD air</i> | B Increase the humidity of atmosphere
<i>Meningkatkan kelembapan atmosfera</i> |
| C Increase the acidity of the water
<i>Meningkatkan keasidan air</i> | D Reduce the vision distance problems
<i>Mengurangkan masalah jarak penglihatan</i> |

- 30** Diagram 23 shows two type of aquatic organisms which live in a pond.

Rajah 23 menunjukkan dua jenis organisma akuatik yang hidup di dalam sebuah kolam.

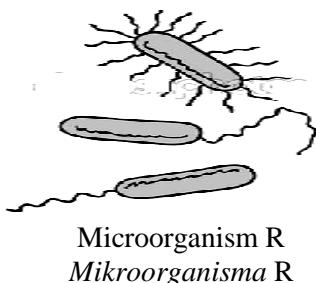


Diagram 23
Rajah 23

Which of the following is true regarding the relationship between the level of BOD in the water, the populations of R and the population of S ?

Antara berikut, manakah yang benar mengenai hubungan antara paras BOD air, populasi R dan populasi S ?

	Level of BOD <i>Paras BOD</i>	Population of R <i>Populasi R</i>	Population of S <i>Populasi S</i>
A	Lower <i>Lebih rendah</i>	<i>Increases</i> <i>Semakin bertambah</i>	Decreases <i>Semakin berkurang</i>
B	Higher <i>Lebih tinggi</i>	<i>Increase</i> <i>Semakin bertambah</i>	Decreases <i>Semakin berkurang</i>
C	Lower <i>Lebih rendah</i>	Decreases <i>Semakin berkurang</i>	Decreases <i>Semakin berkurang</i>
D	Higher <i>Lebih tinggi</i>	<i>Increases</i> <i>Semakin bertambah</i>	<i>Increases</i> <i>Semakin bertambah</i>

- 31** Diagram 24 shows a longitudinal section of a human heart.
Rajah 24 menunjukkan keratan membujur jantung manusia

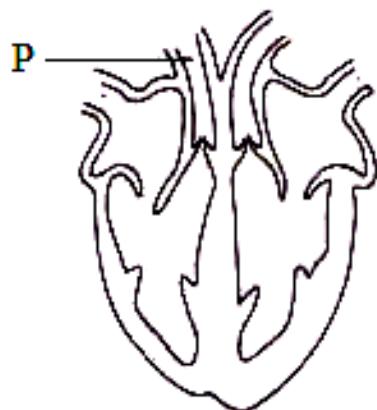


Diagram 24
Rajah 24

What is P?

Apakah P?

A Aorta
Aorta

B Pulmonary vein
Vena Pulmonari

C Pulmonary artery
Arteri Pulmonari

D Posterior vena cava
Vena kava posterior

- 32** The following statements is about blood cell
Pernyataan berikut adalah berkaitan dengan sel darah

- Without granules
Tanpa granul
- Destroy pathogens by phagocytosis
Memusnahkan patogen secara fagositosis

What is the type of this blood cell?

Apakah jenis sel darah ini?

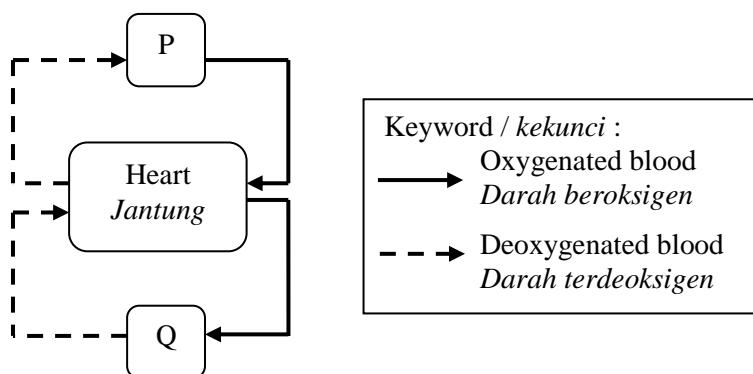
A Erythrocyte
Eritrosit

B Platelet
Platlet

C Neutrophil
Neutrofil

D Monocytes
Monosit

- 33 Diagram 25 shows a double closed circulatory system of an amphibians
Rajah 25 menunjukkan sistem peredaran tertutup ganda dua amfibia



What is P and Q?
Apakah P dan Q?

	P	Q
A	Lungs <i>Peparu</i>	Body tissue <i>Tisu badan</i>
B	Body tissue <i>Tisu badan</i>	Lung <i>Peparu</i>
C	Lungs <i>Peparu</i>	Brain <i>Otak</i>
D	Body tissue <i>Tisu badan</i>	Brain <i>Otak</i>

- 34 Diagram 26 shows an experiment of bark ringing on a branch.
Rajah 26 menunjukkan satu eksperimen menggelang kulit pokok pada satu dahan.

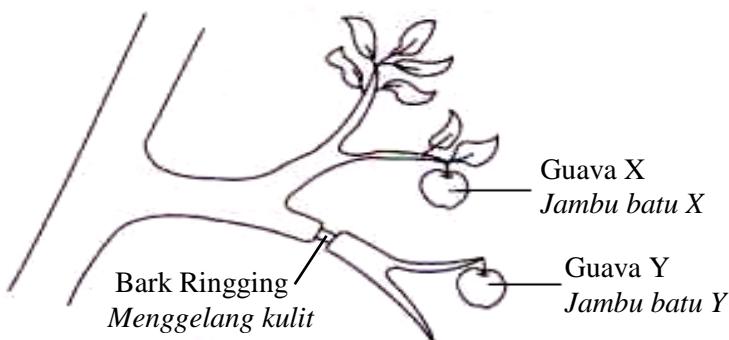


Diagram 26
Rajah 26

What will happen to guava Y after five weeks?
Apakah yang akan berlaku kepada jambu batu Y selepas lima minggu?

- | | |
|------------------------------------------------|------------------------------------------------------------------|
| A Grow bigger
<i>Tumbuh membesar</i> | B Shrinks in size
<i>Saiz mengecil</i> |
| C Remains the same
<i>Kekal sama</i> | D Same size as guava X
<i>Saiz sama dengan jambu X</i> |

- 35 Diagram 27 shows a vertebrae column of human.
Rajah 27 menunjukkan turus vertebra pada manusia.

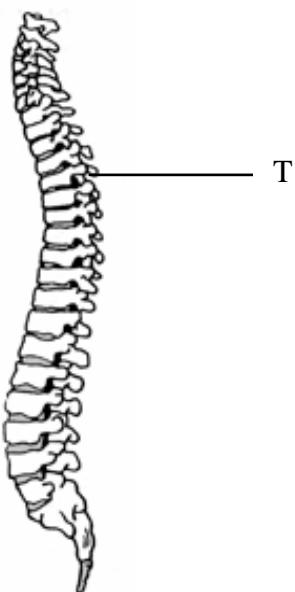
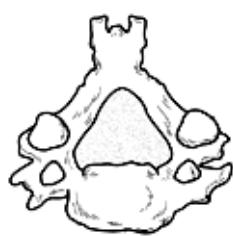


Diagram 27
Rajah 27

Which of the following is correct about T?
Manakah berikut adalah benar tentang T?

A



B



C



D



- 36** Diagram 28 shows a human's ball and socket joint.
Rajah 28 menunjukkan sendi lesung manusia

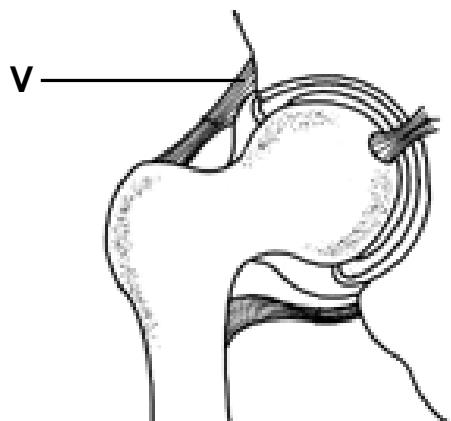


Diagram 28
Rajah 28

Which of the following is true about V?

Manakah berikut benar mengenai V?

- | | | | |
|----------|-----------------------------------------------------------------|----------|------------------------------------------------------------------------------------|
| A | Connect bone and muscle
<i>Menghubungkan tulang dan otot</i> | B | Reduce friction between two bones
<i>Mengurangkan geseran antara dua tulang</i> |
| C | Connect two bones
<i>Menghubungkan dua tulang</i> | D | Produce synovial fluid
<i>Menghasilkan bendalir sinovia</i> |

- 37** Diagram 29 shows fin which involve in movement of fish
Rajah 29 menunjukkan sirip yang terlibat dalam pergerakan ikan.

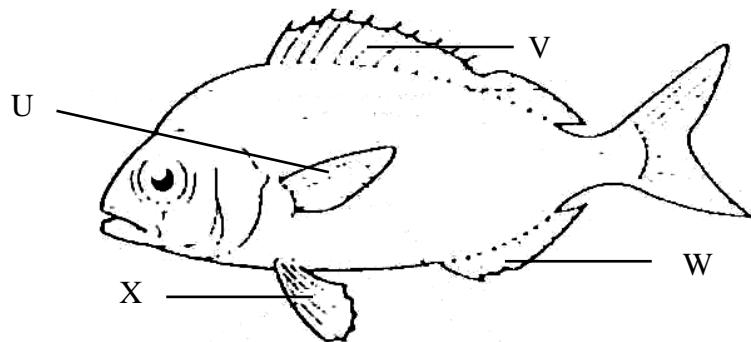


Diagram 29
Rajah 29

Which pair of the fins to avoid rolling and yawing?

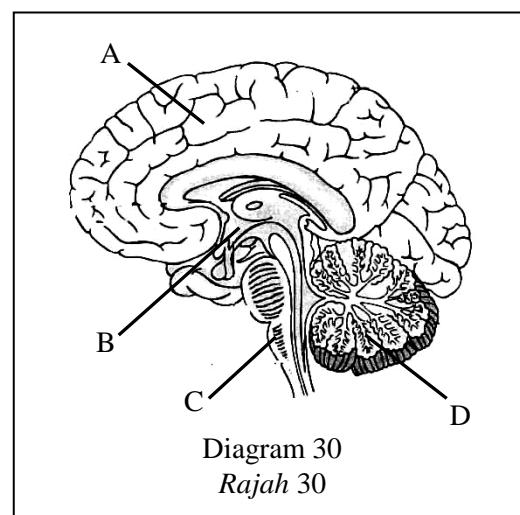
Manakah pasangan sirip yang mencegah golekan dan pesongan?

- | | | | |
|----------|---------------------------|----------|---------------------------|
| A | U and V
<i>U dan V</i> | B | X and W
<i>X dan W</i> |
| C | U and X
<i>U dan X</i> | D | V and W
<i>V and W</i> |

- 38** The brain regulates body temperature, keeping it within a narrow range. The consequences when this fails can be life-threatening, may cause death due to heat stroke. Neurons in the brain adjust the balance between heat generation and heat loss from the body.

Otak mengawal atur suhu badan, mengekalkan suhu pada satu julat kecil. Jika gagal, akan mengancam nyawa, boleh maut akibat strok haba. Neuron-neuron dalam otak mengawal keseimbangan antara penghasilan haba dengan pembebasan haba daripada badan.

Diagram 30 shows structure of the human brain.
Rajah 30 menunjukkan struktur otak manusia.



Which part of the brain controls the body temperature?
Bahagian otak yang manakah mengawal suhu badan?

- | | |
|------------------------------------------------------|----------------------------------------------|
| A Cerebrum
<i>Serebrum</i> | B Hypothalamus
<i>Hipotalamus</i> |
| C Medula oblongata
<i>Medula oblongata</i> | D Spinal cord
<i>Saraf tunjang</i> |

- 39** Diagram 31 shows the structure of one type of neurons in nerve system.
Rajah 31 menunjukkan struktur salah satu jenis neuron dalam sistem saraf.

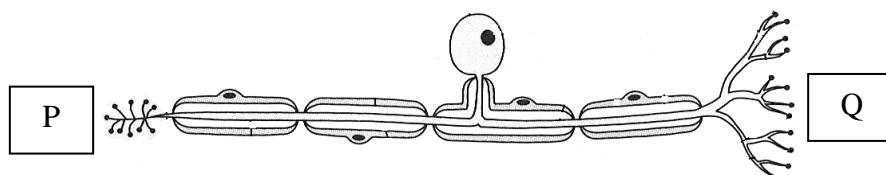


Diagram 31
Rajah 31

This neuron connects to P and Q. What is P and Q?
Neuron ini berhubung dengan P dan Q. Apakah P dan Q ?

	P	Q
A	Interneuron <i>Interneuron</i>	Effector <i>Efektor</i>
B	Receptor <i>Reseptor</i>	Effector <i>Efektor</i>
C	Receptor <i>Reseptor</i>	Interneuron <i>Interneuron</i>
D	Interneuron <i>Interneuron</i>	Efferent neurone <i>Neuron eferen</i>

- 40** The following informations show steps in the coordination of ‘fight or flight’ situation.
Maklumat berikut menunjukkan langkah-langkah dalam kordinasi bagi situasi ‘lawan atau lari’.

- P More glycogen is converted to glucose
Lebih glikogen ditukarkan kepada glukosa
- Q The information is interpreted and sends nerve impulses to the adrenal glands.
Maklumat diinterpretasi dan impuls dihantar ke kelenjar adrenal
- R Nerve impulses from the receptors in eyes transmit to the brain.
Impuls saraf dari reseptor pada mata bergerak ke otak
- S Increase the energy production to give the suitable response
Meningkatkan penghasilan tenaga untuk memberikan gerakbalas sesuai

Which of the following sequences of steps is correct during this situation.
Antara langkah-langkah berikut, yang manakah urutan langkah yang betul semasa situasi ini?

- | | |
|--------------------------------------------------------|--------------------------------------------------------|
| A $R \rightarrow Q \rightarrow P \rightarrow S$ | B $P \rightarrow S \rightarrow R \rightarrow Q$ |
| C $R \rightarrow P \rightarrow Q \rightarrow S$ | D $P \rightarrow R \rightarrow S \rightarrow Q$ |

- 41** Diagram 32 shows the shoot cutting technique to produce a ‘bonsai’ plant .
Rajah 32 menunjukkan teknik pemangkasan pucuk bagi menghasilkan pokok bonsai.



Diagram 32
Rajah 32

Why must the shoot part be removed ?
Mengapa bahagian pucuk perlu dibuang?

- A** To faster fruit ripening
Mempercepatkan pemasakan buah
- B** To promotes a bigger partenocarpic fruits
Untuk menggalakkan buah partenokarpi yang besar
- C** To promotes branching plant
Untuk menggalakkan pengeluaran cabang pokok
- D** To maintain the freshness of flower and leaf
Untuk mengekalkan kesegaran bunga dan daun

- 42 Diagram 33 shows a male reproductive system.
Rajah 33 menunjukkan sistem pembiakan lelaki.

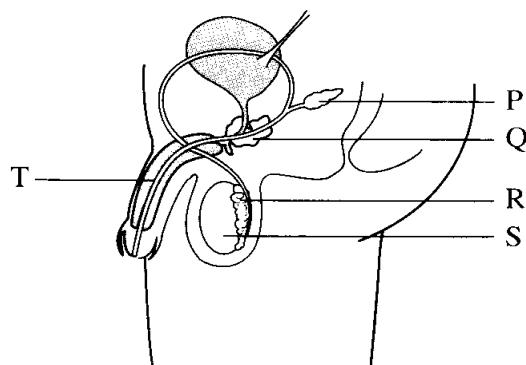


Diagram 33
Rajah 33

In which parts P, Q, R , S and T are sperms produced and stored ?
Dalam bahagian yang manakah P,Q,R S dan T , sperma dihasilkan dan disimpan ?

	Site of production Tempat penghasilan	Site of storage Tempat simpanan
A	S	P
B	S	R
C	Q	P
D	P	T

- 43 Diagram 34 shows proses P and Q and development of structure R and S in the formation of pollen grains in an anther of a flower
Rajah 34 menunjukkan proses P dan Q serta perkembangan struktur R dan S semasa pembentukan debunga di dalam anter

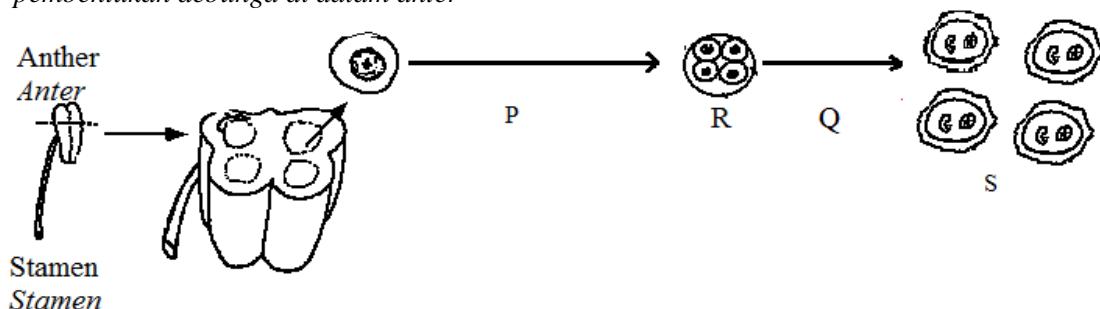


Diagram 34
Rajah 34

What is P,Q, R and S ?
Apakah P, Q, R dan S ?

	P	Q	R	S
A	Meiosis <i>Meiosis</i>	Mitosis <i>Mitosis</i>	Diploid microspore <i>Mikrospora diploid</i>	Pollen grains <i>Debunga</i>
B	Mitosis <i>Mitosis</i>	Meiosis <i>Meiosis</i>	Diploid microspore <i>Mikrospora diploid</i>	Haploid microspore <i>Mikrospora haploid</i>
C	Mitosis <i>Mitosis</i>	Meiosis <i>Meiosis</i>	Pollen grains <i>Debunga</i>	Diploid microspore <i>Mikrospora diploid</i>
D	Meiosis <i>Meiosis</i>	Mitosis <i>Mitosis</i>	Haploid microspore <i>Mikrospora haploid</i>	Pollen grains <i>Debunga</i>

- 44** Diagram 35 shows a development in the ovary.

Rajah 35 menunjukkan perkembangan yang berlaku di dalam ovarium.

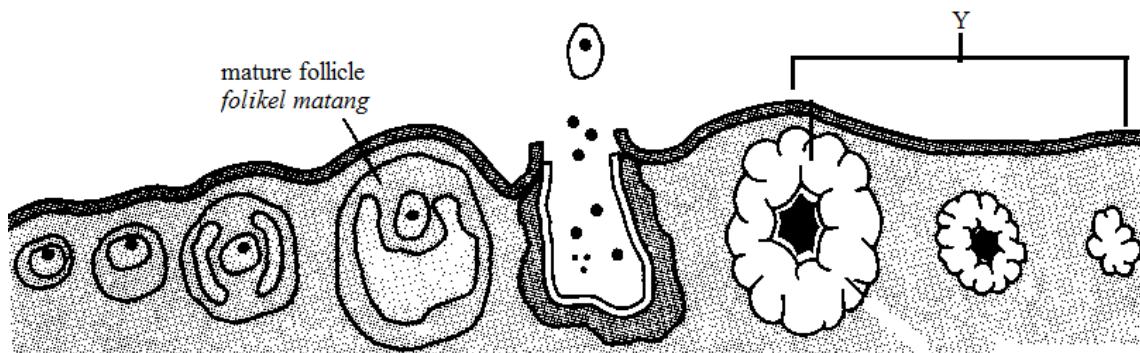


Diagram 35

Rajah 35

Which of the following statements about the stage labelled Y is correct ?

Antara pernyataan berikut, manakah benar tentang peringkat yang berlabel Y ?

- | | |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| A The thickness of the endometrium increases
<i>Ketebalan endometrium meningkat</i> | B The level of LH increases
<i>Aras LH meningkat</i> |
| C The level of FSH increases
<i>Aras FSH meningkat</i> | D The level of progesterone decreases
<i>Aras hormon progesterone menurun</i> |

- 45** Table 2 shows menstrual cycle of a woman. Her menstruation start on 3rd March and her menstrual cycle is 28 days.

Jadual 2 menunjukkan kitar haid seorang wanita. Beliau mengalami haid pada 3 Mac dan kitar haidnya ialah 28 hari.

Week Minggu	March Mac						
	Sunday Ahad	Monday Isnin	Tuesday Selasa	Wednesday Rabu	Thursday Khamis	Friday Jumaat	Saturday Sabtu
1	-	1	2	3	4	5	6
2	7	8	9	10	11	12	13
3	14	15	16	17	18	19	20
4	21	22	23	24	25	26	27

Table 2

Jadual 2

Which week does ovulation occurs?

Minggu berapakah dia akan mengalami ovulasi?

- | | |
|------------------------------------|------------------------------------|
| A Week 1
<i>Minggu 1</i> | B Week 2
<i>Minggu 2</i> |
| C Week 3
<i>Minggu 3</i> | D Week 4
<i>Minggu 4</i> |

- 46** Allele N is control for normal vision while allele n is control for colour blindness. If Linda is a carrier of colour-blindness while her husband, Lutfi, is normal, which of the following genotypes are matched correctly?

Alel N adalah untuk mengawal penglihatan normal manakala n adalah untuk mengawal buta warna. Jika Linda adalah pembawa buta warna manakala suaminya adalah normal, antara genotip berikut, manakah dipadankan dengan betul?

	Linda	Lutfi
A	$X^N X^n$	$X^N Y$
B	$X^N X^N$	$X^n Y$
C	$X^n X^n$	$X^N Y$
D	$X^N X^n$	$X^n Y$

- 47** Haemophilia is a disease caused by a recessive allele, h, on chromosome X.

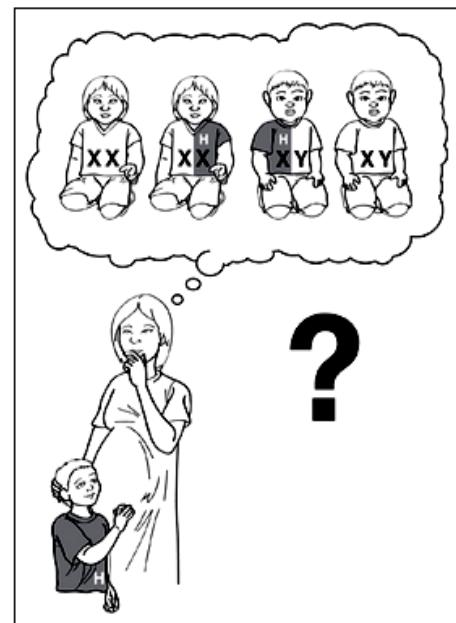
For a mother who carries the hemophilia allele, the chances of giving birth to a child with hemophilia are the same for each pregnancy. Even though she already has a child with hemophilia, she can still give birth to another.

In other case, can a non-carrier mother give birth to a haemophiliac child?

Hemofilia adalah sejenis penyakit yang disebabkan oleh alel resesif, h, pada kromosom X.

Seorang ibu pembawa alel hemofilia, peluang melahirkan seorang anak hemofilia adalah sama bagi setiap kandungan. Walaupun dia sudah mempunyai seorang anak hemofilia, dia masih boleh melahirkan anak lain yang hemofilia.

Dalam kes yang lain, bolehkan seorang ibu bukan pembawa melahirkan seorang anak hemofilia?



Parents:	Amin	x	Sarah
<i>Induk</i>			
Genotype:	$X^h Y$	x	$X^H X^H$
<i>Genotip</i>			

Diagram 36
Rajah 36

Diagram 36 shows the genotypes of a married couple, Amin and Sarah. What is the probability for this couple to get a daughter who is a haemophiliac?

Rajah 36 menunjukkan genotip sepasang suami isteri Amin dan Sarah.

Apakah kebarangkalian pasangan ini akan memperoleh anak perempuan hemofilia?

- | | | | |
|----------|------|----------|-------|
| A | 0 % | B | 25 % |
| C | 50 % | D | 100 % |

- 48** Diagram 37 shows a pedigree chart of blood group inheritance in a family.
Rajah 37 menunjukkan salasilah pewarisan kumpulan darah dalam sebuah keluarga.

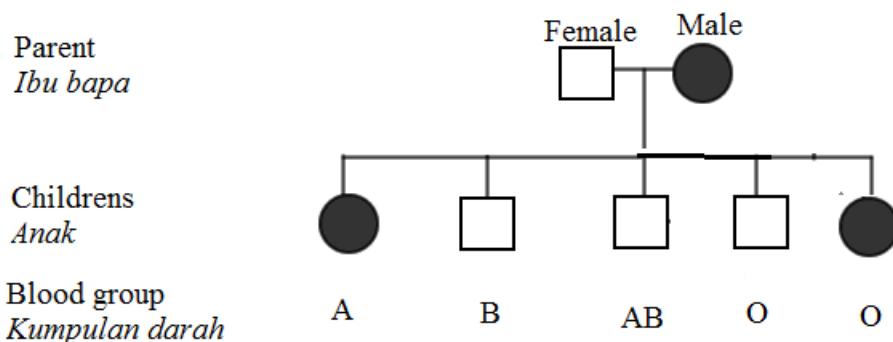


Diagram 37
Rajah 37

Based on diagram 38, what are the possible genotypes of the parent?
Berdasarkan rajah 38, apakah genotip yang mungkin bagi ibu dan bapa tersebut?

- | | |
|-------------------------------------------------------------|-------------------------------------------------------------|
| A $I^B I^B$ and $I^B I^B$
$I^B I^B$ dan $I^B I^B$ | B $I^A I^B$ and $I^A I^B$
$I^A I^B$ dan $I^A I^B$ |
| C $I^A I^O$ and $I^B I^O$
$I^A I^O$ dan $I^B I^O$ | D $I^A I^B$ and $I^O I^O$
$I^A I^B$ dan $I^O I^O$ |

49

People with albinism have a reduced amount of melanin pigments or no melanin at all. They may have very pale hair, skin and eyes. Usually, they have a number of eye problems, such as:

- problems with eyesight
- nystagmus (involuntary eye movements)
- photophobia (sensitivity to light)

Orang albino memiliki kandungan pigmen melanin ataupun tidak mempunyai melanin langsung. Mereka berkemungkinan mempunyai warna rambut, kulit dan mata yang sangat pudar. Biasanya, mereka mempunyai beberapa masalah mata seperti:

- masalah penglihatan
- nistagmus (pergerakan mata luarkawal)
- fotofobia (sensitif kepada cahaya)

Which of the following factor causes albinism in humans?
Antara berikut, faktor manakah yang menyebabkan albinisme pada manusia?

- | | |
|--------------------------------------------------------------|---------------------------------------------------------|
| A Crossing over
<i>Pindah silang</i> | B Gene mutation
<i>Mutasi gen</i> |
| C Environmental factors
<i>Faktor persekitaran</i> | D Chromosomal mutation
<i>Mutasi kromosom</i> |

- 50** Diagram 38 shows the variation type of ear lobe.
Rajah 38 menunjukkan variasi jenis cuping telinga.

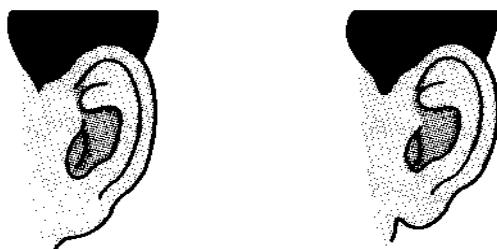
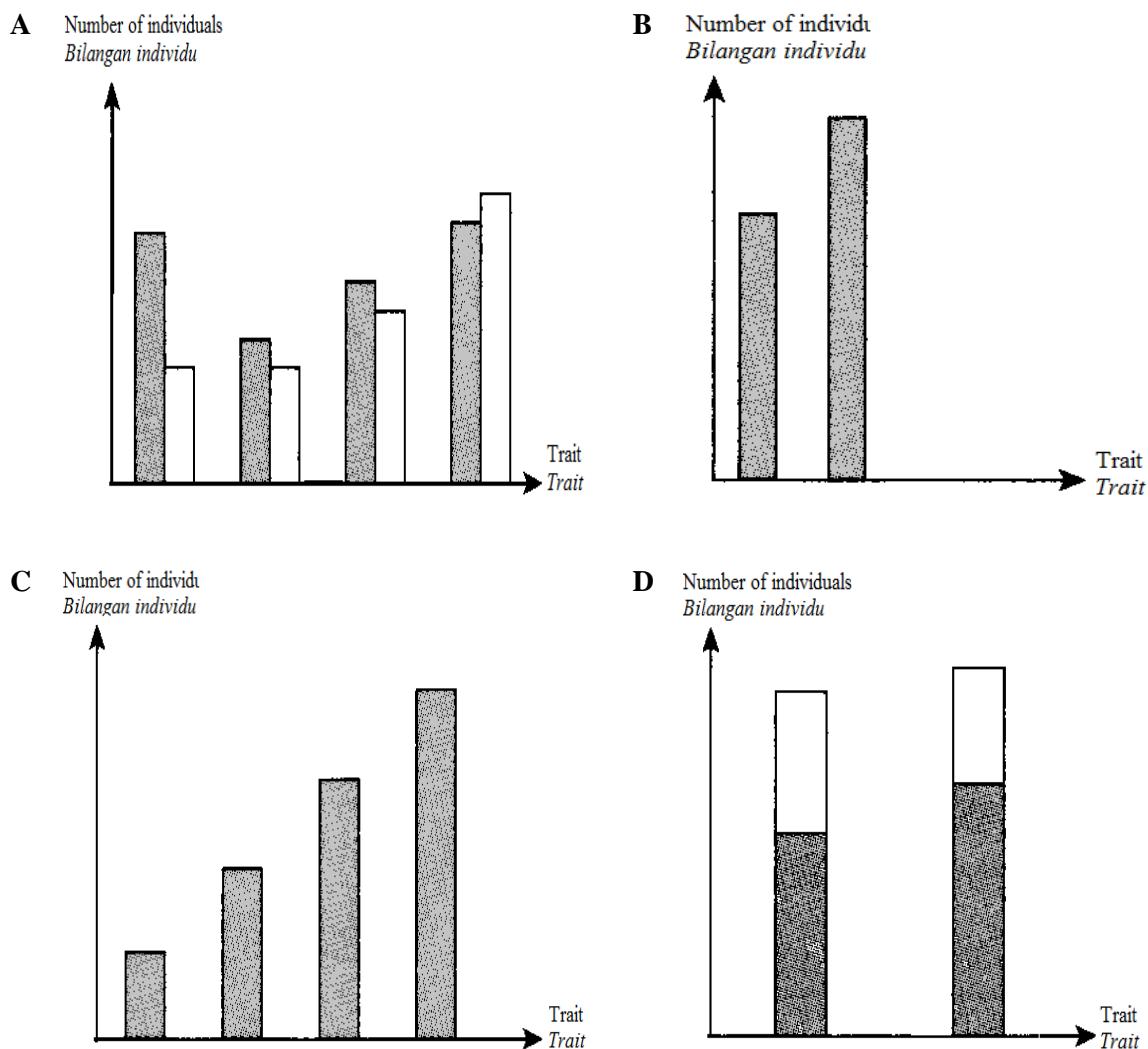


Diagram 38
Rajah 38

Which of the following graph is the best represents the variation type of ear lobe?
Antara graf berikut, manakah paling tepat mewakili variasi jenis cuping telinga?



END OF QUESTION PAPER
KERTAS SOALAN TAMAT