SULIT
4551/1
Biologi
Kertas 1
Ogos/September
2012
1 1/4jam

PEPERIKSAAN PERCUBAAN BERSAMA
SIJIL PELAJARAN MALAYSIA 2012
ANJURAN

MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
CAWANGAN PERLIS

BIOLOGI

Kertas 1

Satu jam lima belas minit

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.

Kertas soalan ini mengandungi 30 halaman bercetak termasuk kulit.

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of 50 questions
   Kertas soalan ini mengandungi 50 soalan.

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

3. Answer each question by blackening the correct space on the answer sheet.
   Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.

4. Blacken only **one** space for each question.
   Hitamkan **satu** *ruangan sahaja bagi setiap soalan.*

5. If you wish to change your answer , erase the blackened mark that you have made. Then blacken the space for the new answer.
   Sekiranya anda hendak menukarkan jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.

6. The diagrams in the questions provided are not drawn to scale unless stated.
   Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.

7. You may use a non-programmable scientific calculator.
   Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

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

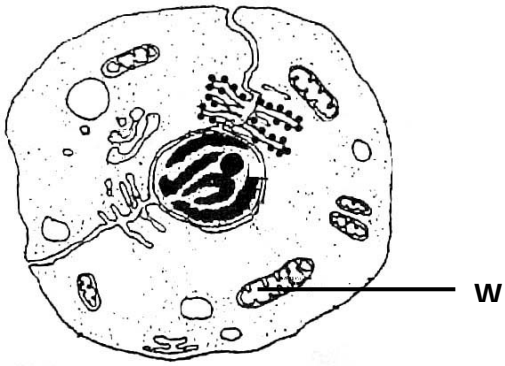


Diagram 1/*Rajah 1*

What is organelle W?
Apakah organel W ?

A Chloroplast
Kloroplas
B Golgi apparatus
Jasad Golgi
C Mitochondrion
Mitokondria
D Smooth endoplasmic reticulum
Jalinan endoplasma licin

2

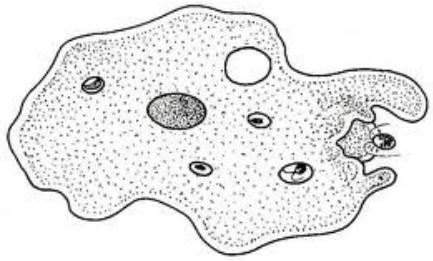


Diagram 2/*Rajah 2*

Which of the following sequence of feeding mechanism of *Amoeba* sp. is **correct**?
*Antara berikut yang manakah urutan mekanisma pemakanan Ameoba sp. yang **betul**?*

P	The food particles are digested by lysozyme *Cebisan makanan dihadamkan oleh enzim lisozim*
Q	Food vacuole are formed *Vakuol makanan dibentuk*
R	Two pseudopodia engulf food particles *Dua pseudopodia mengepung partikel makanan*
S	The cell assimilated the nutrients and left the undigested materials *Sel mengasimilasi nutrien dan meninggalkan bahan yang tidak tercerna*

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

3 Diagram 3 shows a model of the plasma membrane.
Rajah 3 menunjukkan model membran plasma.

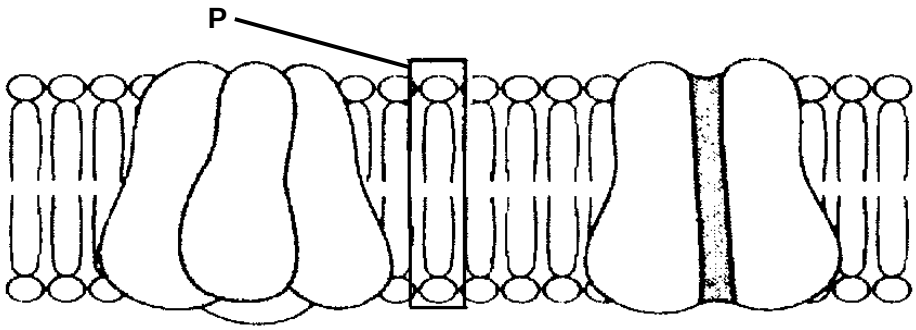


Diagram 3/*Rajah 3*

Which of the following pair is correctly match?
Manakah antara berikut dipadankan dengan betul?

	Structure P ***Struktur P***	**Function** ***Fungsi***
A	Cholesterol *Kolesterol*	Makes palsma membrane stronger *Menjadikan membrane plasma lebih kuat*
B	Phospholipid *Fosfolipid*	Allow water molecule to pass through *Membenarkan molekul air melaluinya*
C	Carrier protein *Protein pembawa*	Allow glucose and small proteins to pass through *Membenarkan molekul glukosa dan protein kecil melaluinya*
D	Pore protein *Protein liang*	Fatty acid and glycerol are transported through *Asid lemak dan gliserol diangkut melaluinya*

4 Diagram 4 shows a strip of mustard green after it has been soaked in solution P.
Rajah 4 menunjukkan jalur sawi selepas direndam dalam larutan P.

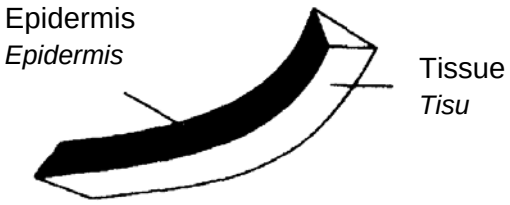


Diagram 4/*Rajah 4*

What is solution P?
Apakah larutan P?

A Distilled water
Air suling

B Salt solution
Larutan garam

C Concentrated sucrose solution
Larutan sukrosa pekat

D Concentrated glucose solution
Larutan glukosa pekat

5 Diagram 5 shows the condition of a fresh plant cell after they have been immersed in solution Z.
Rajah 5 menunjukkan keadaan struktur sel tumbuhan segar selepas direndam dalam larutan Z.

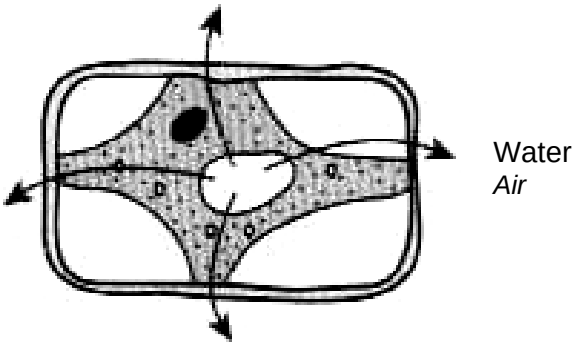


Diagram 5/*Rajah 5*

Which of the following statement is **TRUE** to describe the condition of the cell?
*Yang manakah diantara kenyataan berikut **BENAR** bagi menerangkan keadaan sel?*

A Water molecule diffuse out through facilitated diffusion.
Molekul air meresap keluar melalui proses resapan berbantu.

B Solution Z is a hypertonic solution to the cell sap.
Larutan Z adalah hipertonik terhadap sap sel.

C Solution Z is a hypotonic solution to the cell sap.
Larutan Z adalah hipotonik terhadap sap sel.

D The cell undergroes deplasmolysis.
Sel tersebut mengalami deplasmolisis.

6 Diagram 6 shows a protein molecule structure.
Rajah 6 menunjukkan struktur molekul protein.

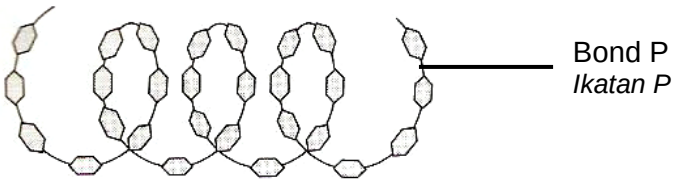


Diagram 6/*Rajah 6*

What is bond P?
Apakah ikatan P?

A Hydrogen bond
Ikatan hidrogen

B Disulphide bond
Ikatan disulfida

C Peptide bond
Ikatan peptida

D Polypeptide bond
Ikatan polipeptida

7 Diagram 7 shows the mechanism of enzyme action that follow the 'lock-key hipothesis' principle.
Rajah 7 menunjukkan mekanisme tindakan enzim yang bertindak mengikut prinsip 'kunci dan mangga hipotesis.

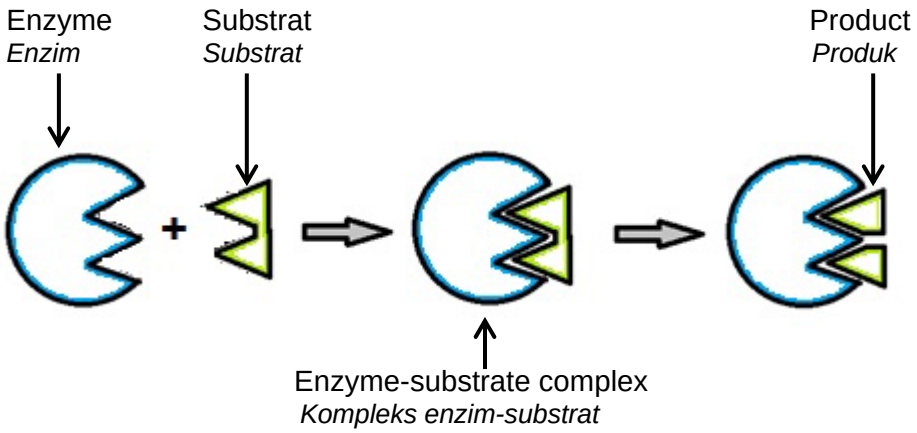


Diagram 7/*Rajah 7*

Which property of the enzyme can be illustrated by the diagram?
Di antara ciri-ciri enzim berikut, yang manakah boleh digambarkan oleh rajah di atas?

I Ezyme action is specific
Tindakan enzim adalah spesifik

II Enzyme molecule is not destroyed by the reaction
Molekul enzim tidak dimusnahkan selepas tindakbalas

III High temperature can destroy the active site
Suhu yang tinggi boleh memusnahkan tapak aktif

IV Enzyme are needed in a small quantity
Enzim diperlukan dalam kuantiti yang sedikit

A I and III only
I dan III sahaja

B II and IV only
II dan IV sahaja

C I and II only
I dan II sahaja

D I, II, III and IV
I, II, III dan IV

8 Diagram 8 shows an activity done by Luqman to investigate action of pepsin on egg albumen.
Rajah 8 menunjukkan aktiviti yang dijalankan oleh Luqman untuk mengkaji tindakan enzim pepsin ke atas albumin telur.

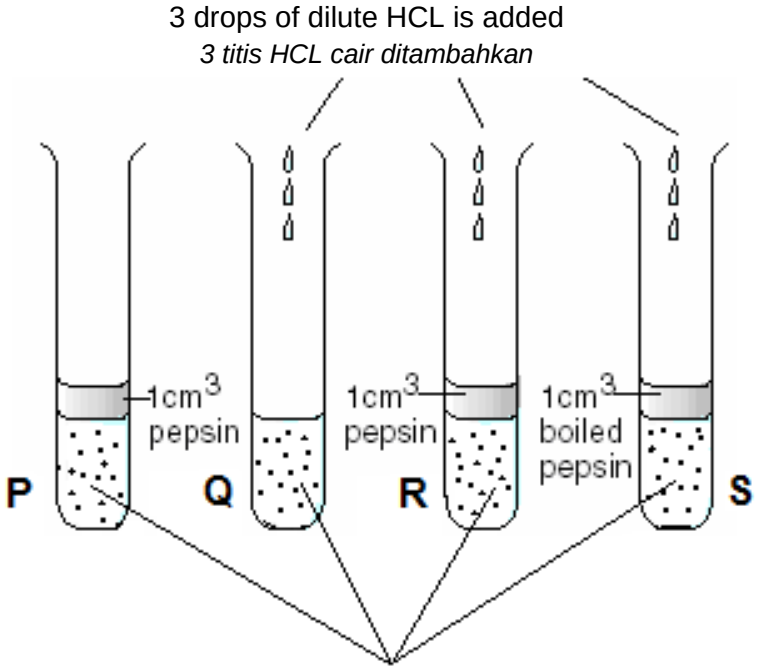


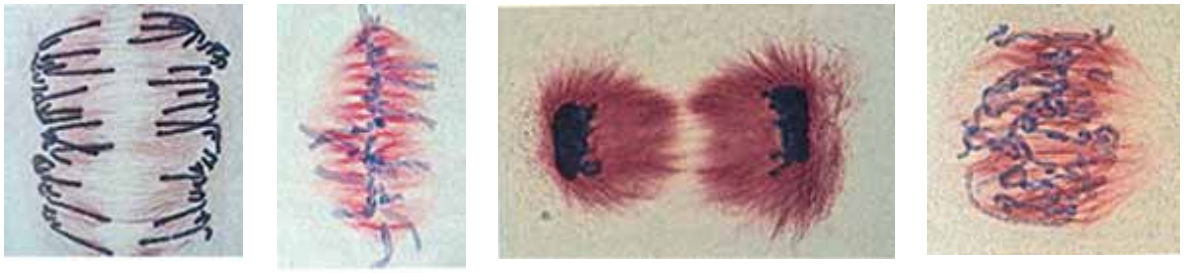
Diagram 8/*Rajah 8*

The tubes are immersed in a water bath at 37°C.
Tabung uji direndamkan dalam kukus air pada suhu 37°C.

What are the observations should he get after 20 minutes?
Apakah pemerhatian yang mungkin dia perolehi selepas 20 minit?

	P	Q	R	S
A	Clear *Jernih*	Cloudy *Keruh*	Cloudy *Keruh*	Cloudy *Keruh*
B	Cloudy *Keruh*	Cloudy *Keruh*	Clear *Jernih*	Cloudy *Keruh*
C	Clear *Jernih*	Cloudy *Keruh*	Clear *Jernih*	Cloudy *Keruh*
D	Clear *Jernih*	Cloudy *Keruh*	Clear *Jernih*	Clear *Jernih*

9 Diagram 9 shows stages in mitosis in a somatic cell of a frog.
Rajah 9 menunjukkan peringkat-peringkat mitosis dalam sel soma seekor katak.



P Q R S

Diagram 9/*Rajah 9*

Which of the following is the **correct** sequence for the process?
*Antara berikut, yang manakah menunjukkan urutan yang **betul** bagi proses tersebut?*

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

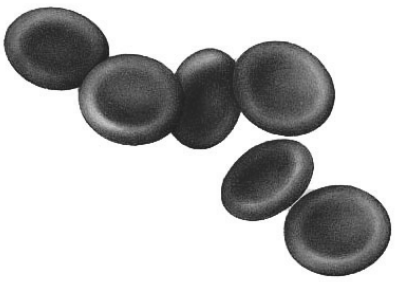
10 If diploid number of chromosomes in a nucleus of an organism cell is 30, how many chromosomes are there in the new daughter cells that are formed through mitosis?
Jika bilangan kromosom diploid di dalam nukleus satu sel organisma ialah 30, berapakah bilangan kromosom sel anak yang terbentuk melalui mitosis?

A 15
B 30
C 45
D 60

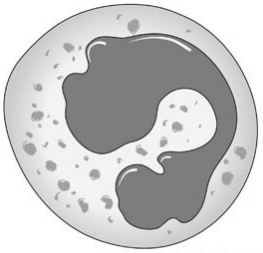
11 Which of the following cells is the product of meiosis?
Sel yang manakah adalah hasil meiosis?

A

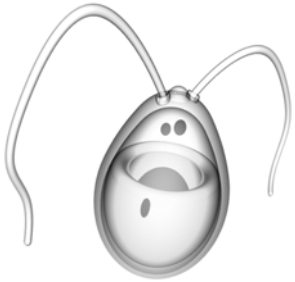
B



C



D



12 Diagram 10 shows a reproductive cell of an animal which undergo process of meiosis 1.
Rajah 10 menunjukkan sel reproduktif suatu haiwan sedang mengalami meiosis 1.

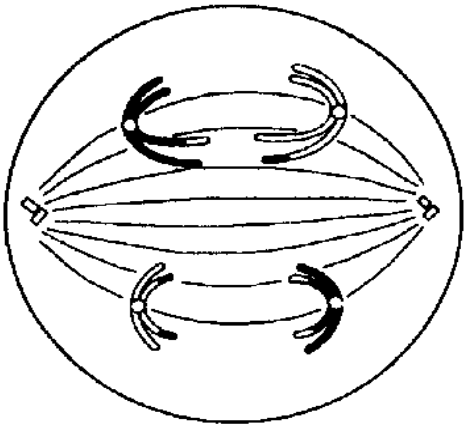


Diagram 10/*Rajah 10*

Which is correct to describe the cell?
Yang manakah benar menerangkan tentang sel tersebut?

	The number of chromosomes in the gamete cells of the animal *Bilangan kromosom yang terdapat dalam sel gamet haiwan tersebut*	**The Phases of cell division** *Peringkat Pembahagian sel*
A	*2*	Anaphase *Anafasa*
B	*4*	Prophase I *Profasa I*
C	*4*	Anaphase II *Anafasa II*
D	*2*	Anaphase I *Anafasa I*

13 Diagram 11 is an example of transgenic crops like tomatoes have been created through genetic engineering.
Rajah 11 menunjukkan contoh tanaman transgenik seperti buah tomato yang berjaya dihasilkan melalui kejuruteraan genetik.

	
Normal tomato after two weeks *Tomato normal selepas dua minggu*	Transgenic tomato after two weeks *Tomato transgenik selepas dua minggu*

Diagram 11/*Rajah 11*

Which of the following statements are **TRUE** in describing transgenic crops?
Pernyataan yang manakah BENAR untuk menerangkan tentang tumbuhan transgenik?

I Transgenic crops contain new traits and are beneficial because their genes are from other organisms that is being inserted into their chromosomes.
Tumbuhan transgenik mempunyai trait yang baharu dan berfaedah kerana gen daripada organisma lain telah disisipkan ke dalam kromosomnya.

II Resistant to certain pathogen.
Mempunyai rintangan terhadap patogen tertentu.

III Show higher growth rate with higher and better quality yields.
Menunjukkan kadar pertumbuhan yang cepat dengan hasil yang banyak dan berkualiti.

IV Transgenic plants can be cloned to commercialised.
Tumbuhan transgenik boleh diklonkan untuk dikomersialkan.

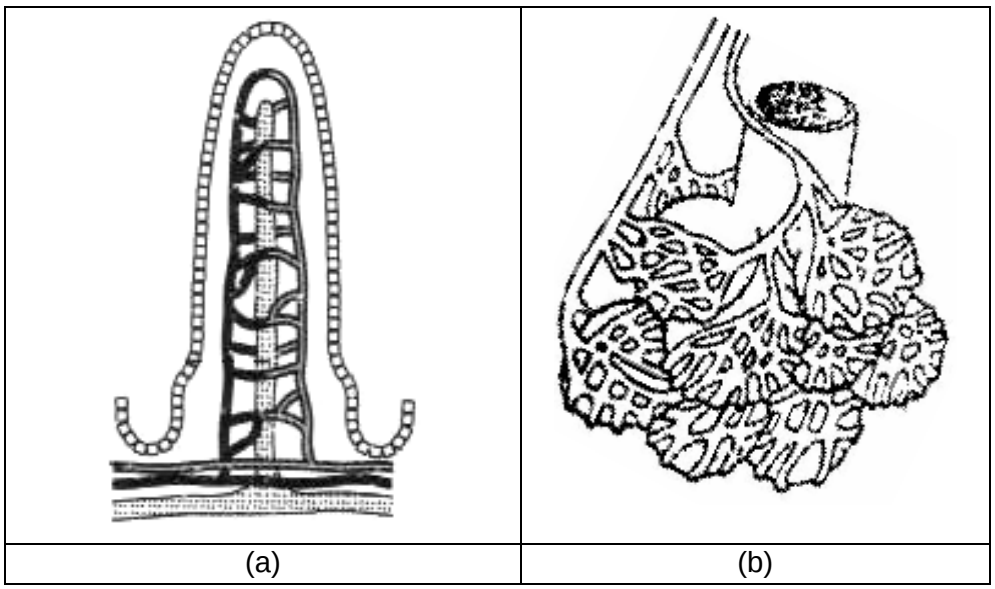
A I and III only
I dan III sahaja

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

14 Stuctures shown in Diagram 12(a) and 12(b) have many strucural adaptation in order to function more efficiently.
Struktur yang ditunjukkan di dalam Diagram 12(a) dan 12(b) di bawah telah diadaptasi untuk membolehkannya menjalankan fungsi dengan lebih efisien.



(a) (b)

Diagram 12/*Rajah 12*

Which adaptations are consist in both structure?
Penyesuaian manakah yang terdapat pada kedua-duanya.?

I Network of blood capillaries
Jaringan kapilari darah

II Abundant in number
Bilangan yang banyak

III Thin and moist epithelial walls
Dinding epitelium nipis dan lembap

IV Have lacteals to absorb amino acids and glycerol
Mempunyai lakteal untuk menyerap asid amino dan gliserol

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

15 Diagram 13 shows components of the cow alimentary canal.
Rajah 13 menunjukkan komponen salur alimentari seekor lembu.

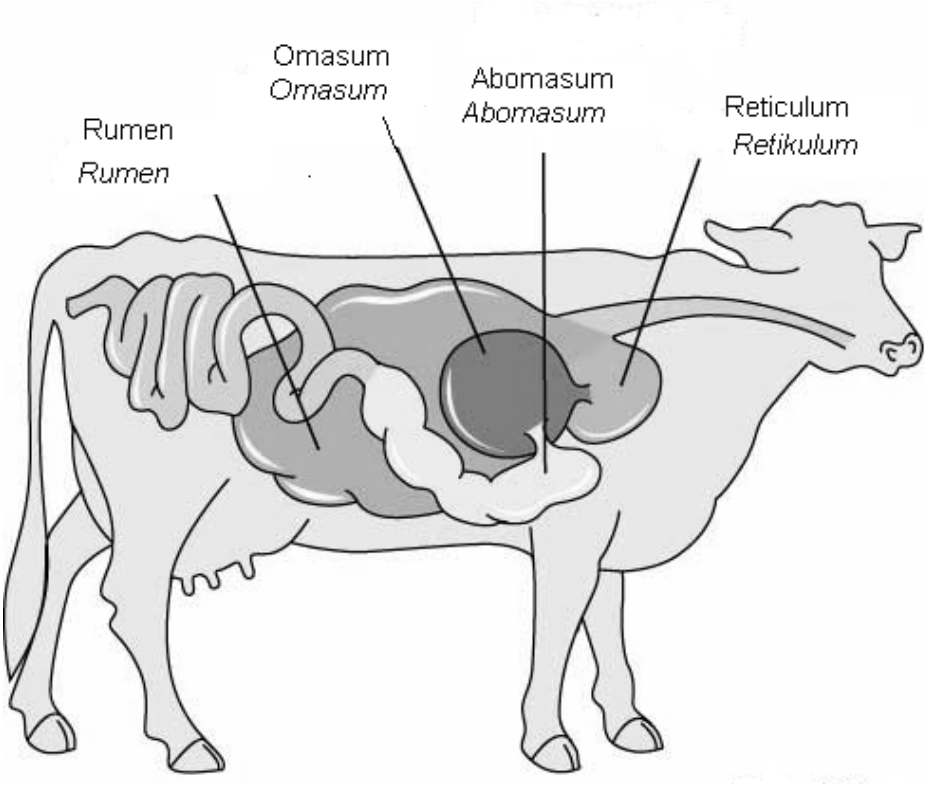


Diagram 13/*Rajah 13*

Which of the following is **correct** to describe the system?
*Antara yang berikut, yang manakah **benar** menerangkan tentang system tersebut?*

A Omasum is the true stomach
Omasum adalah perut sebenar

B The cud that is reswallowed is moved to abomasum
Mamahan yang ditelan semula masuk ke abomasum

C Herbivores like rodents have this type of digestive system
Haiwan seperti rodensia mempunyai sistem pencernaan jenis ini

D Population of bacteria and protozoa in the rumen and reticulum secretes enzyme cellullase to digest cellulose
Populasi bakteria dan protozoa yang terdapat di dalam rumen dan retikulum merembeskan enzim selulase untuk mencernakan selulosa

16

- This people may have a normal body mass but experience an intense fear of gaining weight.
  Individu ini selalunya mempunyai berat badan yang normal tetapi sangat takut menjadi gemuk.
- Out of control in consuming food, followed by self-induced vomiting.
  Sukar berhenti apabila makan tetapi memuntahkan semula makanan yang dimakan.
- This people may die from severe weight loss and undernourished conditions.
  Individu mungkin akan mati akibat kehilangan berat badan dan kekurangan nutrien.

Based on the statements above, what is the health problem does the individual most likely suffering from?
Berdasarkan pernyataan diatas, apakah masalah kesihatan yang dialami oleh individu tersebut?

A Anorexia nervosa
Anorexia nervosa

B Obesity
Kegemukan

C Bulimia
Bulimia

D Gastritis
Gastrik

17 Diagram 14 shows the structure of a chloroplast.
Rajah 14 menunjukkan struktur kloroplas.

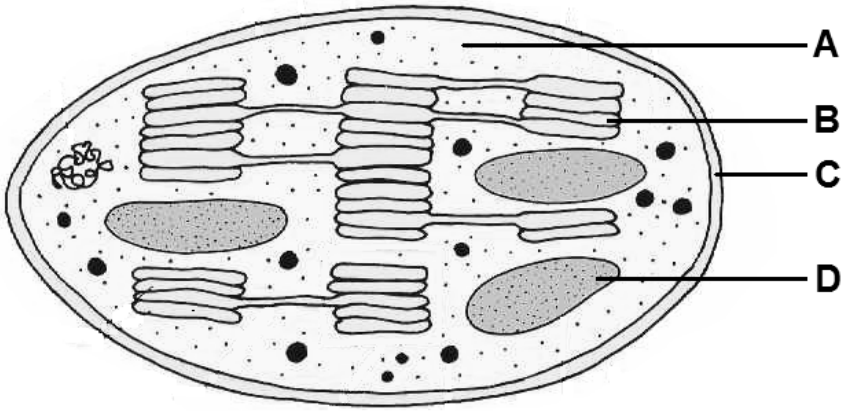


Diagram 14/*Rajah 14*

Which part of the chloroplast labelled **A, B, C** and **D** does the fixation of carbon dioxide occur?
*Antara bahagian kloroplas berlabel **A, B, C** dan **D**, di manakah pengikatan karbon dioksida berlaku?*

18 The given word equation shows the reaction which occurs during a type of respiration.
Persamaan perkataan yang diberi menunjukkan tindak balas yang berlaku semasa sejenis respirasi.

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

What organisms carry out this type of respiration?
Organisma apakah yang menjalankan jenis respirasi ini?

A Plants
Tumbuhan

B Bacteria
Bakteria

C Protozoa
Protozoa

D Humans
Manusia

19 Diagram 15 shows gaseous exchange between alveolus and blood capillaries.
Rajah 15 menunjukkan pertukaran gas antara alveolus dan kapilari darah.

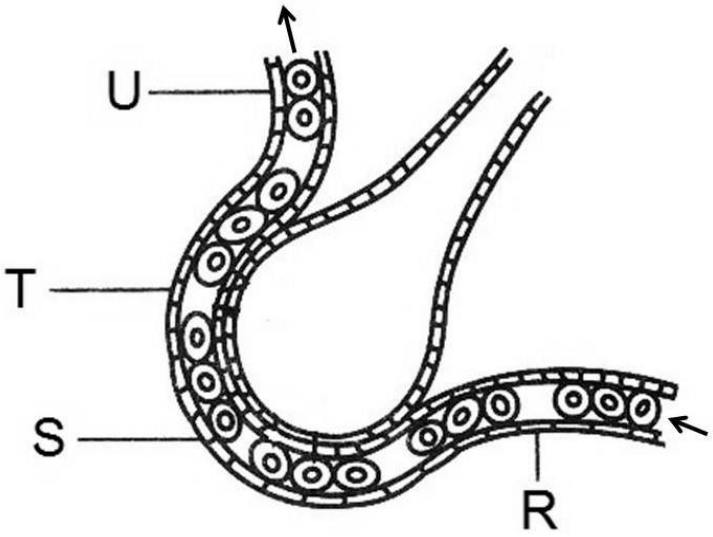


Diagram 15/*Rajah 15*

At which position of the blood capillary does the blood have the lowest concentration of oxygen? *Pada kedudukan kapilari darah manakah darah mempunyai kepekatan oksigen yang paling rendah?*

A R

B S

C T

D U

20 Diagram 16 shows the respiratory structure of an aquatic organism.
Rajah 16 menunjukkan struktur respirasi bagi satu organisma akuatik.

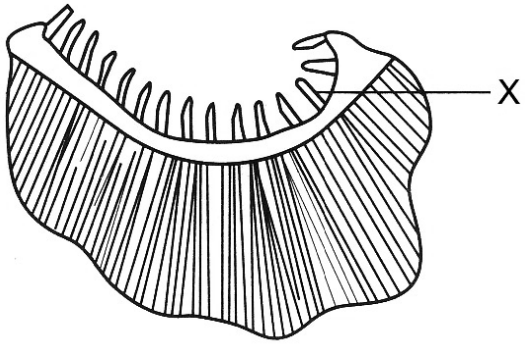


Diagram 16/*Rajah 16*

What is the function of X?
Apakah fungsi X?

A It increases the surface area to make diffusion easier.
Ia menambah luas permukaan supaya resapan berlaku dengan mudah.

B It nourishes the respiratory structure with nutrients and oxygen.
Ia menyuburkan struktur respirasi dengan nutrien dan oksigen.

C It provides support and protection to the respiratory structure.
Ia memberi sokongan dan perlindungan kepada struktur respirasi.

D It resists the movement of the respiratory structure due to a change in pressure.
Ia menentang pergerakan struktur respirasi yang disebabkan oleh perubahan pada tekanan.

21 The table shows the percentage composition of different gases in the air. The atmospheric pressure at sea level is 760mmHg.
Jadual menunjukkan peratusan komposisi gas dalam udara yang berbeza. Tekanan atmosfera pada aras laut ialah 760mmHg.

Gas *Gas*	Percentage composition in air (%) *Peratusan komposisi dalam udara (%)*
Nitrogen *Nitrogen*	78.09
Oxygen *Oksigen*	20.95
Carbon dioxide *Karbon dioksida*	0.03
Argon *Argon*	0.93
Water *Air*	0

What is the partial pressure of oxygen?
Apakah tekanan separa bagi oksigen?

A 20.95 mmHg

B 149.37 mmHg

C 159.22 mmHg

D 593.48 mmHg

22 Diagram 17 shows a food web.
Rajah 17 menunjukkan siratan makanan.

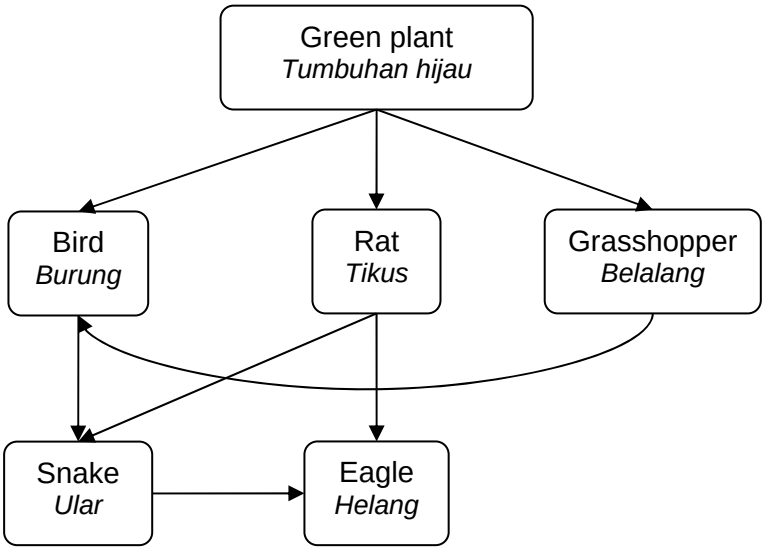


Diagram 17/*Rajah 17*

Which of the following are primary consumers?
Antara yang berikut, yang manakah adalah pengguna primer?

I Rat
Tikus

II Bird
Burung

III Eagle
Helang

IV Snake
Ular

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

23 Diagram 18 shows the interaction between organisms.
Rajah 18 menunjukkan interaksi antara organisma.

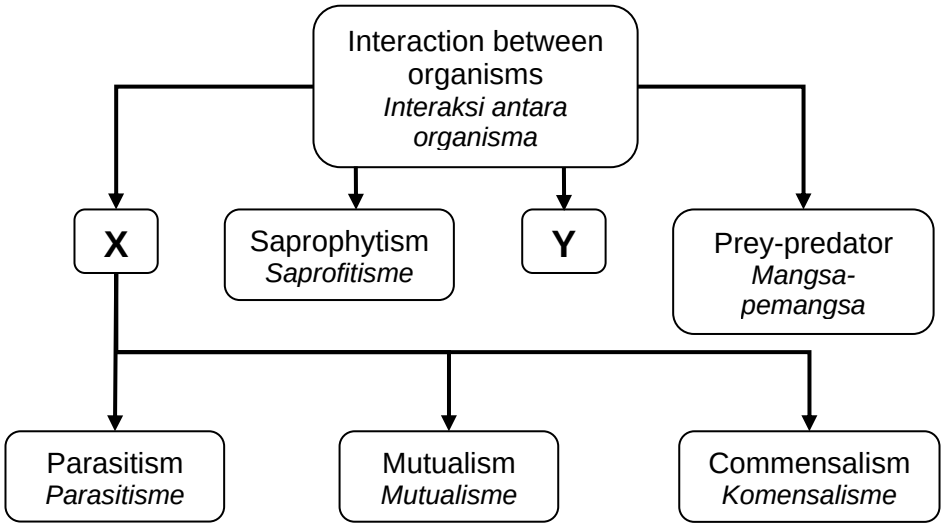
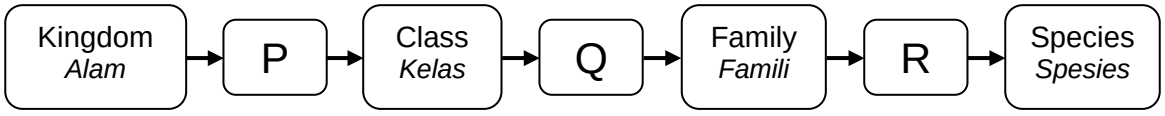


Diagram 18/*Rajah 18*

What are X and Y?
Apakah X dan Y?

	X	Y
A	Predation *Pemangsaan*	Competition *Persaingan*
B	Symbiosis *Simbiosis*	Competition *Persaingan*
C	Succession *Sesaran*	Symbiosis *Simbiosis*
D	Symbiosis *Simbiosis*	Predation *Pemangsaan*

24 The following information shows the hierarchy in the classification of organisms.
Maklumat yang berikut menunjukkan hierarki dalam pengelasan organisma.



What are P, Q and R?
Apakah P, Q dan R?

	P	Q	R
A	Order *Order*	Genus *Genus*	Phylum *Filum*
B	Phylum *Filum*	Order *Order*	Genus *Genus*
C	Phylum *Filum*	Genus *Genus*	Order *Order*
D	Order *Order*	Phylum *Filum*	Genus *Genus*

25 Diagram 19 shows the distribution of mangrove trees at the banks of a river mouth.
Rajah 19 menunjukkan taburan pokok bakau di tebing muara sungai.

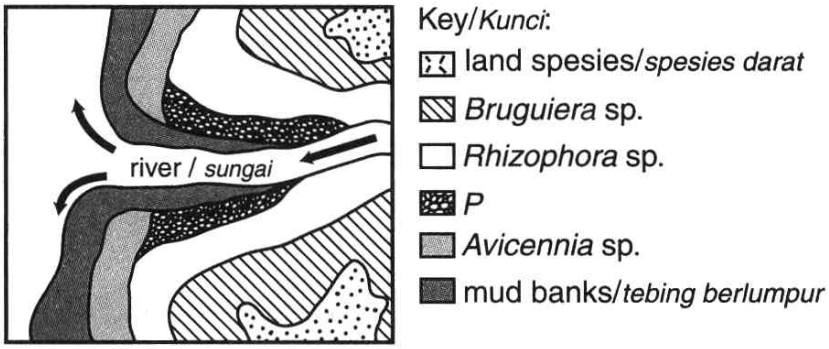


Diagram 19/*Rajah 19*

What are the characteristics that plant P has?
Apakah ciri-ciri yang ada pada tumbuhan P?

A It has a root system that spreads out widely.
Ia mempunyai sistem akar yang tumbuh luas.

B It grows well in hard clay soil.
Ia membesar dengan baik dalam tanah liat keras.

C It has buttress roots to trap mud.
Ia mempunyai akar banir untuk memerangkap lumpur.

D It has thin cuticles.
Ia mempunyai kutikel yang nipis.

26 A group of students carried out a study on the population of snails in a garden. They used capture-mark-release and recapture technique in the study. Which of the following assumptions need to be made for this technique?
Sekumpulan pelajar menjalankan kajian ke atas populasi siput dalam taman. Dalam kajian itu, mereka menggunakan kaedah tangkap tanda lepas dan tangkap semula. Antara berikut, andaian manakah yang perlu dibuat bagi kaedah ini?

I The snails that are marked can mix freely with the snails which are not marked.
Siput yang telah ditanda boleh bergaul dengan siput yang tidak ditanda.

II The snails are caught randomly.
Siput ditangkap secara rawak.

III The number of predators must be controlled in the garden.
Beberapa binatang pemangsa dalam taman perlu dikawal.

IV The birth rate of snails is the same as the death rate of snails.
Kadar kelahiran siput adalah sama dengan kadar kematian siput.

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 20 shows two types of vehicles.
Rajah 20 menunjukkan dua jenis kenderaan.

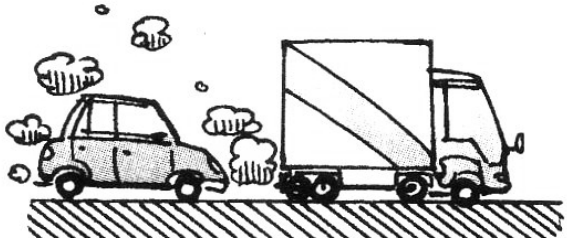


Diagram 20/*Rajah 20*

What are the main pollutants emitted by these vehicles?
Apakah bahan pencemar utama yang dibebaskan oleh kenderaan tersebut?

I Benzene
Benzin

II Sulphur dioxide
Sulfur dioksida

III Nitrogen dioxide
Nitrogen dioksida

IV Carbon monoxide
Karbon monoksida

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

28 Eutrophication can be caused by the following **except**
*Eutrofikasi boleh disebabkan oleh semua yang berikut **kecuali***

A untreated sewage
Kumbahan yang tidak dirawat

B run-offs containing domestic waste
air larian yang mengandungi buangan domestik

C overuse of chlorofluorocarbons in the industries
Penggunaan kloroflurokarbon berlebihan dalam Industri

D leaching of nitrates and phosphate from agricultural field
penyerapan nitrat dan fosfat daripada kawasan pertanian

29 The sample of water in a lake shows a low BOD level.
Sampel air dari suatu tasik menunjukkan tahap BOD yang rendah.

Which of the following statement best describe the situation?
Manakah antara pernyataan berikut yang terbaik menerangkan tentang keadaan tersebut?

A Pollution by untreated waste
Pencemaran oleh sisa yang tidak dirawat

B An increase in the temperature of the lake.
Peningkatan suhu tasik.

C The high amount of dissolve oxygen in the lake.
Jumlah oksigen terlarut yang tinggi di dalam tasik.

D A decrease activity of microorganism in the lake
Penurunan aktiviti mikroorganisma dalam tasik

30 Diagram 21 shows a pair of guard cells and the stoma.
Rajah 21 menunjukkan sepasang sel pengawal dan stoma.

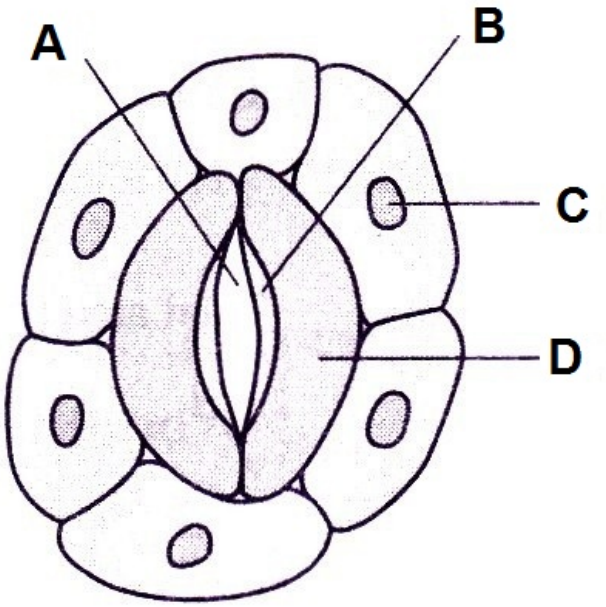


Diagram 21/*Rajah 21*

Of the parts labelled, which is responsible for the opening and closing of the stoma?
Pada bahagian yang berlabel, yang manakah bertanggungjawab untuk pembukaan dan penutupan stoma?

31 The graph in diagram 22 shows several types of immunities.
Graf dalam rajah 22 menunjukkan beberapa jenis keimunan.

Which one best represents passive immunity?
Yang mana satukah yang paling baik mewakili keimunan pasif?

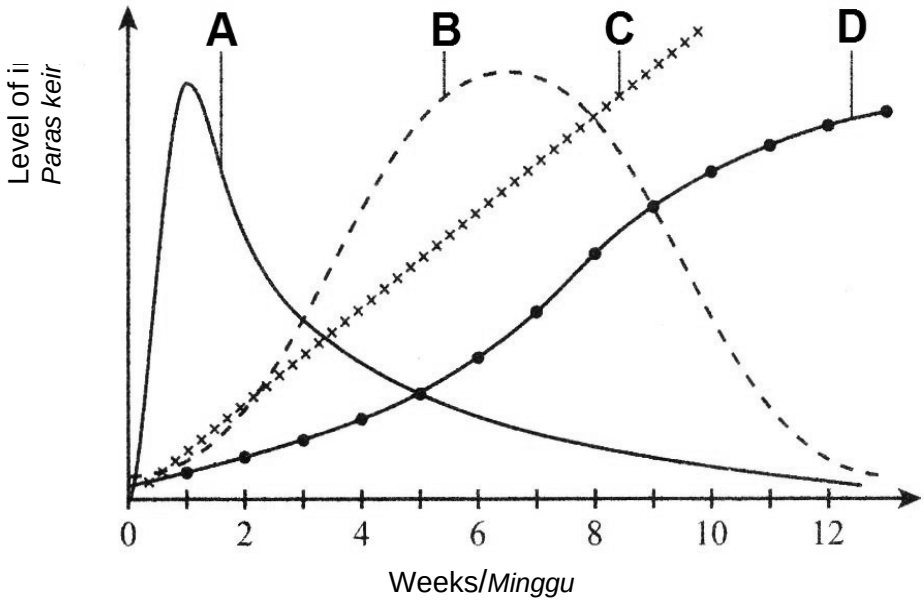


Diagram 22/*Rajah 22*

32 Structure X shown in diagram 23 exists in veins.
Struktur X yang ditunjukkan dalam rajah 23 wujud dalam vena.

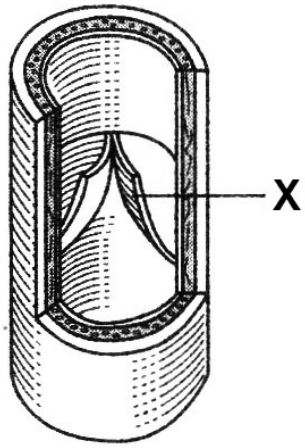


Diagram 23/*Rajah 23*

It has the function of
Ia mempunyai fungsi

A causing the blood to flow downwards to the feet
menyebabkan darah mengalir ke bawah ke bahagian kaki

B preventing backflow of blood on its way back to the heart
menghalang pengaliran balik darah dalam perjalanan pulang ke jantung

C ensuring the muscles around it contract to squeeze the blood back to the heart
memastikan otot di sekitarnya mengecut untuk memerah darah balik ke jantung

D pulsating in rhythm with the heartbeat as blood flows through it
berdenyut seirama dengan degupan jantung semasa darah mengalir melaluinya

33 Which hereditary disease occurs due to lack of certain clotting factors in the blood?
Penyakit keturunan yang manakah yang berlaku akibat kekurangan faktor pembekuan darah tertentu di dalam darah?

A Embolism
Embolisme

B Thrombosis
Trombosis

C Haemophilia
Hemofilia

D Arteriosclerosis
Arteriosklerosis

34 A young plant has all its root hair removed. The rate of transpiration of the plant decreases.
Satu tumbuhan muda telah dibuang akar rerambutnya. Kadar transpirasi tumbuhan tersebut menurun.

Which of the following statement correctly explain the condition?
Antara pernyataan berikut yang manakah menerangkan keadaan tersebut?

A Reduce surface area for absorption of water.
Mengurangkan luas permukaan untuk penyerapan air.

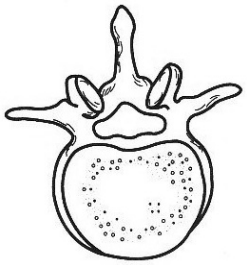
B Reduce rate of water transport.
Mengurangkan kadar pengangkutan air.

C Reduce rate of evapouration.
Mengurangkan kadar penyerapan.

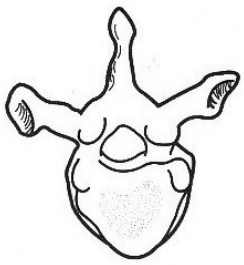
D Reduce capillarity action.
Mengurangkan tindakan kapilari.

35 Which of the following bones is formed by the fusion of four bones?
Antara tulang yang berikut, manakah yang terbentuk daripada gabungan empat tulang?

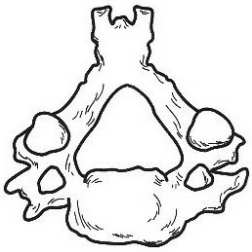
A



C



B



D

36 Diagram 24 shows W-shaped muscle segments.
Rajah 24 menunjukkan segmen otot berbentuk W

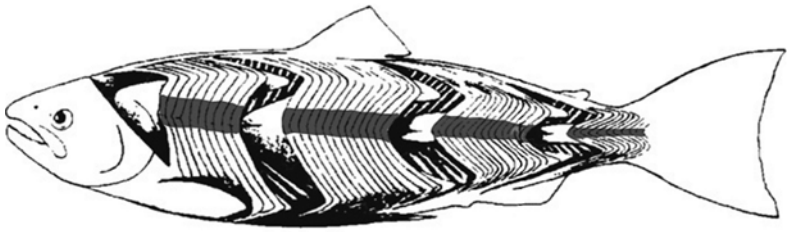


Diagram 24/*Rajah 24*

The W-shape muscles in the fish are
Otot berbentuk W pada ikan adalah

A myosin muscles
otot miosin

B microfilament muscles
otot mikrofilamen

C myotome muscles
otot miotom

D microscopic muscles
otot mikroskopik

37 Which of the following musculoskeletal problems is closely related to the diet and the oestrogen level of a person?
Antara masalah otot rangka berikut, manakah yang berkait rapat dengan cara pemakanan dan aras estrogen seseorang?

A Muscle cramps
Kekejangan otot

B Osteoporosis
Osteoporosis

C Osteoarthritis
Osteoartritis

D Muscular dystrophy
Distrofi otot

38 Diagram shows three types of neurons.
Rajah menunjukkan tiga jenis neuron.

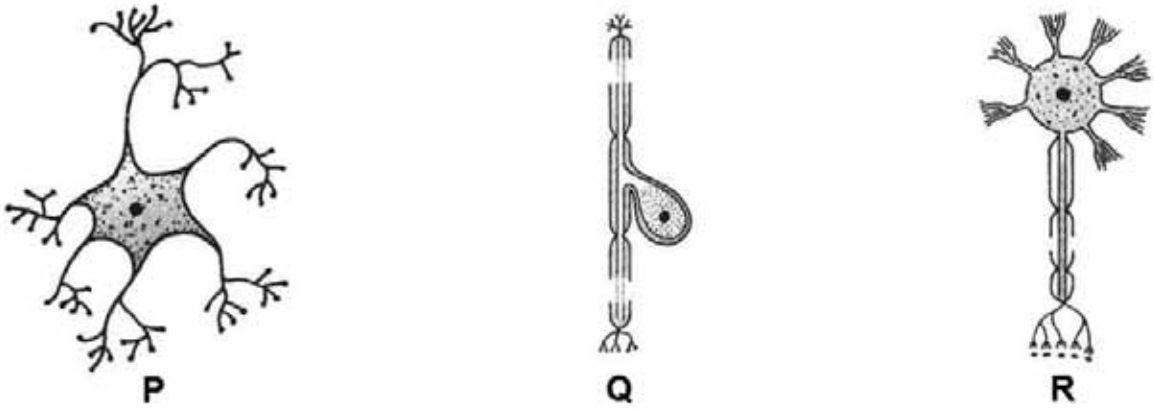


Diagram 25/*Rajah 25*

Which of the following neurones are named correctly?
Manakah antara neuron berikut yang dinamakan dengan betul?

	P	Q	R
A	Interneurone *Interneuron*	Efferent neurone *Neuron eferen*	Afferent neurone *Neuron aferen*
B	Efferent neurone *Neuron eferen*	Afferent neurone *Neuron aferen*	Interneurone *Interneuron*
C	Efferent neurone *Neuron eferen*	Interneurone *Interneuron*	Afferent neurone *Neuron aferen*
D	Interneurone *Interneuron*	Afferent neurone *Neuron aferen*	Efferent neurone *Neuron eferen*

39 Diagram shows the mechanism of regulation of the body temperature of a normal person.
Rajah menunjukkan mekanisme pengawalaturan suhu badan seseorang yang normal.

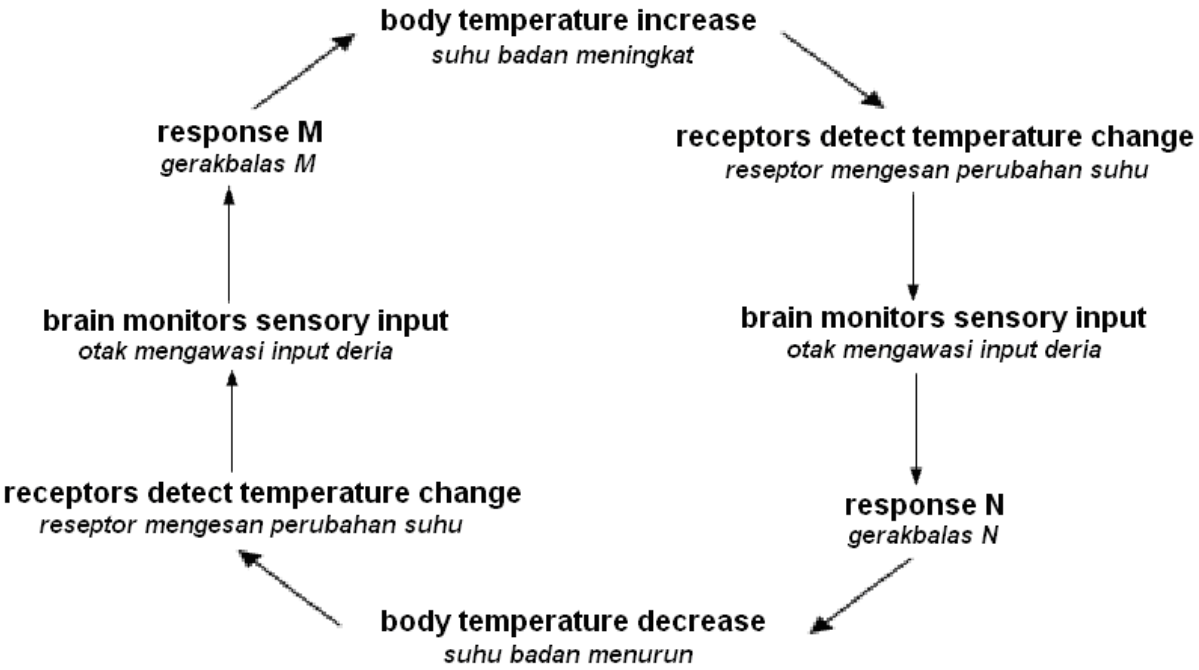


Diagram 26/*Rajah 26*

What are response M and response N?
Apakah gerak balas M dan gerakbalas N?

	Response M *Gerakbalas M*	Response N *Gerakbalas N*
A	Increased shivering *Penggigilan ditingkatkan*	Decreased production of sweat *Penghasilan peluh ditingkatkan*
B	Increased metabolic rate *Kadar metabolisme ditingkatkan*	Increased shivering *Penggigilan ditingkatkan*
C	Decreased production of sweat *Penghasilan peluh dikurangkan*	Vasoconstriction *Pemvasocerutan*
D	Vasoconstriction *Pemvasocerutan*	Increased production of sweat *Penghasilan peluh ditingkatkan*

40 Diagram shows the radicle of a seedling divided into 10 equal zones from its tip. The change in length of each zone is observed after three days.
Rajah menunjukkan radikel satu biji benih yang dibahagikan kepada 10 zon yang sama dari hujungnya. Perubahan panjang pada setiap zon diperhatikan selepas tiga hari.

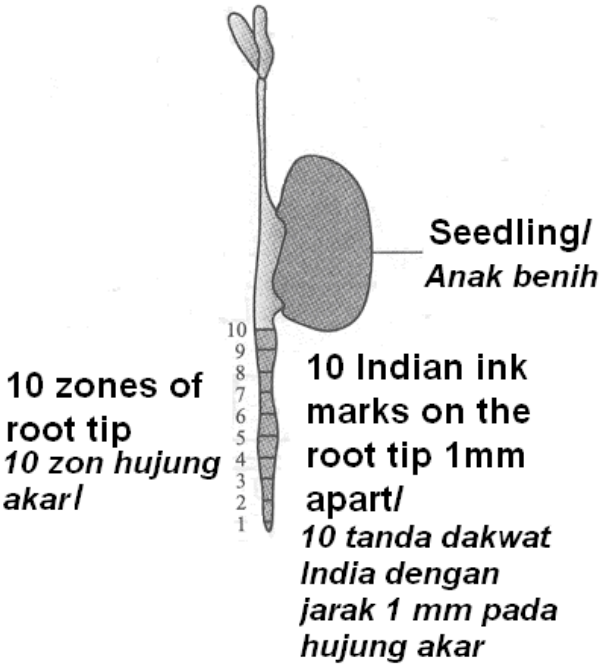
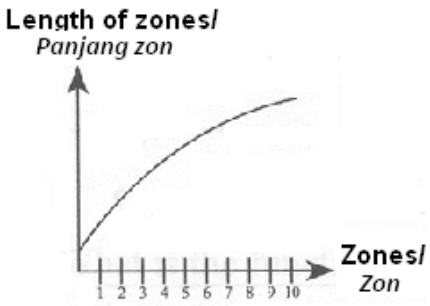
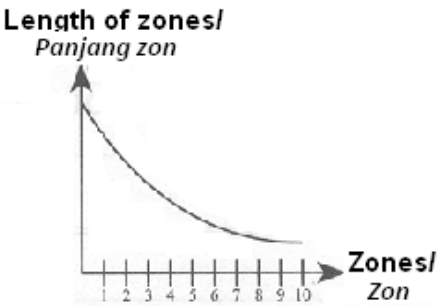
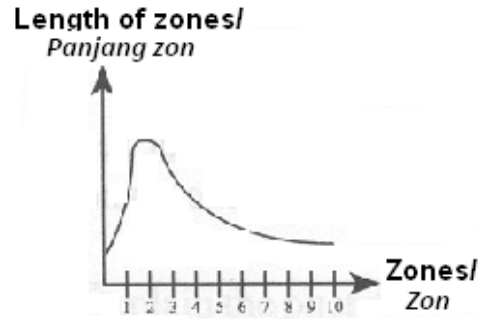


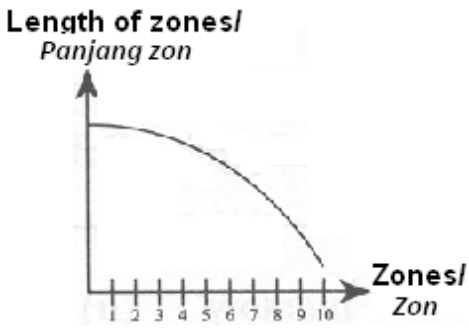
Diagram 27/*Rajah 27*

Which of the following graphs represents the growth of the radicle?
Manakah graf berikut yang mewakili pertumbuhan radikel itu?

A


C


B


D


41 Table 1 shows the process of prenatal development in humans.
Jadual 1 menunjukkan satu proses perkembangan kehamilan dalam manusia

J	Implantation of blastocyst *Perlekatan blastosis*
K	Fertilisation *Persenyawaan*
L	Cell division to form morula *Pembahagian sel untuk membentuk morula*
M	Blastocyst freely moves in the uterus *Blastosis bergerak bebas dalam uterus*

Table 1/*Jadual 1*

A J → K → L → M

B K → L → J → M

C M → L → K → J

D K → L → M → J

42 The pistil of a flower consists of…
Pistil sekuntum bunga termasuklah…

A stigma, style, anther, sepal and ovary
stigma, stil, anter, sepal dan ovari

B stigma, style, ovary, filament and ovary
stigma, stil, ovary, filamen dan ovari

C stigma, style, ovule, ovary and sepal
stigma, stil, ovul, ovary dan sepal

D stigma, style, ovary and ovule
stigma, stil, ovary dan ovul

43 A pregnant woman was infected on the 16th week of pregnancy. The infection caused the placenta to stop functioning. What is the effect of the infection?
Seorang wanita mengandung telah dijangkiti pada minggu ke 16 kehamilannya. Jangkitan itu telah menyebabkan plasentanya tidak berfungsi. Apakah kesan jangkitan itu?

A A Down's syndrome child is born
Anak yang menghidap sindrom Down dilahirkan

B The uterus wall continue to thicken
Dinding uterus terus menebal

C The foetus is aborted
Fetus akan keguguran

D The foetus continues to develop
Fetus terus berkembang

44 Diagram shows a sigmoid growth curve of an organism.
Rajah menunjukkan lengkung pertumbuhan sigmoid suatu organisma.

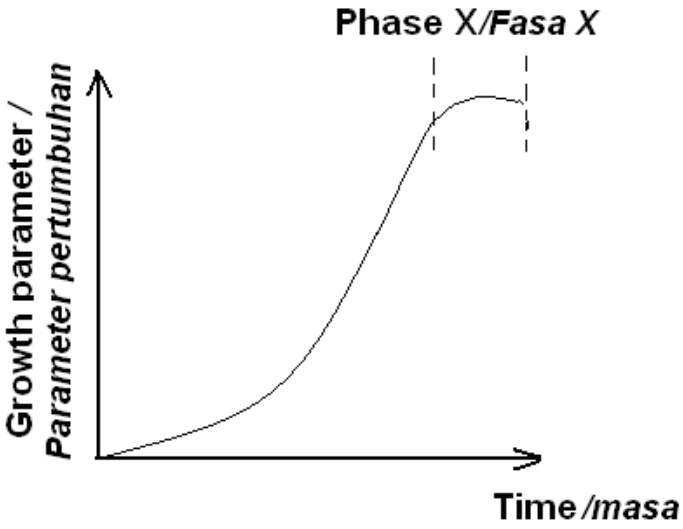


Diagram 28/*Rajah 28*

What will happen at phase X?
Apakah yang berlaku pada fasa X?

I The growth rate is zero
Kadar pertumbuhan ialah sifar

II It has the highest growth rate
Kadar pertumbuhan ialah paling tinggi

III The size of an organism increase rapidly
Saiz organisma bertambah dengan cepat

IV Cell division occurs to replace dead cells
Pembahagian sel berlaku untuk menggantikan sel-sel yang telah mati

A I and II
I dan II

B I and IV
I dan IV

C II and III
II dan III

D III and IV
III dan IV

45 Diagram 29 shows a pair of homologous chromosomes.
Rajah 29 menunjukkan sepasang kromosom homolog.

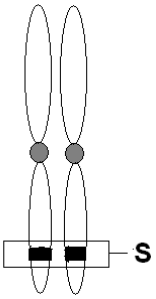


Diagram 29/*Rajah 29*

What is S?
Apakah S?

A Gene
Gen

B Trait
Trait

C Allele
Alel

D Characteristic
Ciri

46 Table shows the Punnett square representing the gametes involved and the offspring produced from a dihybrid cross. Numbers 1 to 16 represent offspring produced by the cross.
Jadual menunjukkan segiempat Punnett yang mewakili gamet-gamet yang terlibat dan anak-anak yang terhasil daripada satu kacukan dwihibrid. Nombor 1 hingga 16 mewakili anak-anak yang terhasil daripada kacukan ini.

Gamete *Gamet*	**AB**	**aB**	**Ab**	**ab**
AB	1	2	3	4
aB	5	6	7	8
Ab	9	10	11	12
ab	13	14	15	16

Table 2/*Jadual 2*

Which of the following numbers show homozygous genotype?
Manakah antara nombor-nombor berikut menunjukkan genotip homozigot?

A 3 and 14
3 dan 14

B 1 and 16
1 dan 16

C 5 and 10
5 dan 10

D 9 and 12
9 dan 12

47 A colour blind man married a woman with a normal vision who is a carrier. If they were to have a daughter, what is the probability that she would be colour blind?
Seorang lelaki buta warna berkahwin dengan seorang wanita penglihatan normal. Jika mereka mendapat anak perempuan, apakah kebarangkalian anak perempuan itu buta warna?

A 0

B 0.25

C 0.5

D 1.0

48 The diagram shows a type of chromosomal mutation.
Rajah menunjukkan sejenis mutasi kromosom.

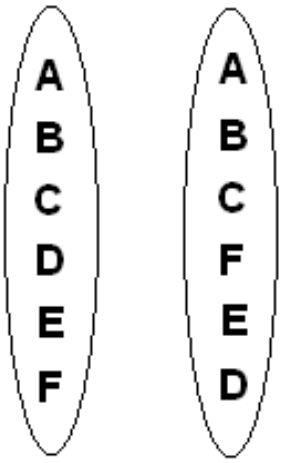


Diagram 30/*Rajah 30*

This type of chromosomal mutation is called…
Jenis mutasi kromosom ini dikenali sebagai…

A deletion
pelenyapan

B inversion
penyongsangan

C duplication
penggandaan

D translocation
translokasi

49 Table shows the height and weight of two individuals P and Q.
Jadual menunjukkan ketinggian dan berat badan dua individu P dan Q.

Individual *Individu*	Height (cm) *Ketinggian (cm)*	Weight (kg) *Berat (kg)*
P	175	65
Q	82	75

Table 3/*Jadual 3*

Which is the major factor that causes the difference between individuals P and Q?
Apakah faktor utama yang menyebabkan perbezaan antara individu P dan Q?

A Genetic factor
Faktor genetik

B Environment factor
Faktor persekitaran

C Hormonal inbalance
Ketidakseimbangan hormon

D Mutation
Mutasi

50 A couple has four children with blood groups A, B, AB and O. What are the posibble blood groups of the couple?
Sepasang suami isteri mempunyai empat orang anak dengan kumpulan darah A, B, AB dan O. Apakah kumpulan darah yang mungkin bagi pasangan suami isteri tersebut?

	Husband *Suami*	Wife *Isteri*
A	A	B
B	AB	O
C	AB	AB
D	B	AB

KERTAS SOALAN TAMAT

Nama: ……...

Tingkatan: …… No Kad Pengenalan: …. ……..……

PEPERIKSAAN PERCUBAAN BERSAMA SIJIL PELAJARAN MALAYSIA 2011

ANJURAN
MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
CAWANGAN PERLIS

BIOLOGI

KERTAS 2

Dua jam tiga puluh minit

JANGAN BUKA SOALAN INI SEHINGGA DIBERITAHU

1. *Tuliskan **nama**, tingkatan dan **no. kad pengenalan** pada ruang yang disediakan.*
2. *Kertas soalan ini adalah dalam dwibahasa.*
3. *Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.*
4. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam Bahasa Melayu atau Bahasa Inggeris.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Bahagian	Soalan	Markah penuh	Markah diperolehi
A	1	12	
	2	12	
	3	12	
	4	12	
	5	12	
B	6	20	
	7	20	
	8	20	
	9	20	
Jumlah			

Kertas soalan mengandungi 25 halaman bercetak termasuk kulit.

INFORMATION FOR CANDIDATE
MAKLUMAT UNTUK CALON

1. This question paper 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 answers for **Section A** in the spaces provided in the question paper.
   Jawab **semua** *soalan dalam* **Bahagian A***. Tulis jawapan bagi* **Bahagian A** *dalam ruang yang disediakan dalam kertas soalan.*

3. Answer one question from **Section B** and one question from **Section C**. Write your answers for **Section B** and **Section C** in detail. You can use equation, diagram, table, graph and any other suitable ways to clarify your answer.
   Jawab **satu** *soalan daripada* **Bahagian B** *dan satu soalan daripada* **Bahagian C***.*
   Tulis jawapan bagi **Bahagian B** *dan* **Bahagian C** *dengan terperinci.*
   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 mengira, ini membantu anda mendapatkan markah.

5. If you wish to change your answer, neatly cross out your answer that you have done. Then write down the new answer.
   Sekiranya anda hendak menukar sesuatu jawapan, batalkan dengan kemas jawapan yang telah dibuat. Kemudian tulis jawapan yang baru.

6. The diagrams in the questions are not drawn to scale unless stated.
   Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.

7. Marks allocated for each question or part question are shown in brackets.
   Markah yang diperuntukkan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan.

8. The time suggested to answer **Section A** is 90 minutes, **Section B** is 30 minutes and **Section C** is 30 minutes.
   Masa yang dicadangkan untuk menjawab **Bahagian A** *ialah 90 minit,* **Bahagian B** *ialah 30 minit dan* **Bahagian C** *ialah 30 minit.*

9. You may use a non-programmable scientific calculator.
   Anda dibenarkan menggunakan kalkulator saintifik yang tidak diprogramkan.

10. Hand in all your answer sheets at the end of the examination.
    Serahkan semua kertas jawapan anda diakhir peperiksaan.

Section A
Bahagian A

[60marks/ *60 markah*]

Answer **all** questions in this section.
*Jawab **semua** soalan dalam bahagian ini.*

1 Diagram 1.1 shows the organelles of an animal cell.
Rajah 1.1 menunjukkan organel-organel di dalam sel haiwan.

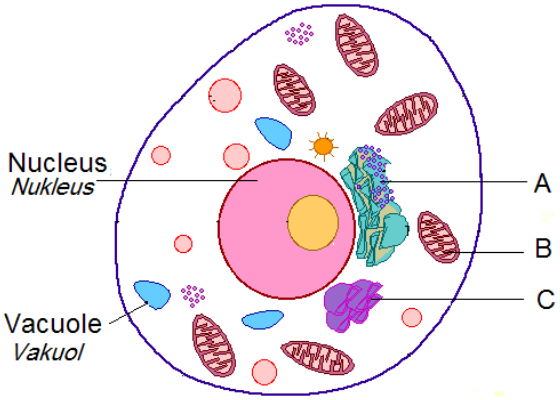


Diagram 1.1
Rajah 1.1

(a) Name the organelles labeled A and B in Diagram 1.1.
Namakan organel-organel yang berlabel A dan B pada Rajah 1.1.

A : ..... B : .....

[2 marks/*2 markah*] 2

(b) (i) What is the role of C?
Apakah peranan C?

.....

..... [2 marks/*2 markah*] 2

[Lihat sebelah

(ii) State **one** example of a substance released from C.
*Nyatakan **satu** bahan yang dibebaskan dari C.*

.....

[1 mark/*1markah*]

1

(iii) Explain how substances in C are secreted outside the cell.
Terangkan bagaimana bahan di C dirembeskan ke luar sel.

.....

.....

.....

.....

[3 markah/*3 marks*]

3

(c) Diagram 1.2 shows a zygote at two-cell stage.
Rajah 1.2 menunjukkan satu sel zigot pada peringkat dua sel.

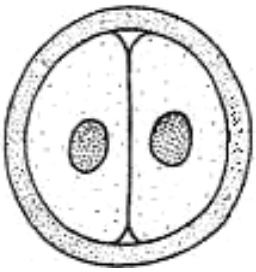


Diagram 1.2
Rajah 1.2

(i) State the process of cell division involved in formation of cell as shown in diagram 1.2.
Nyatakan proses pembahagian sel yang terlibat di dalam pembentukan sel seperti ditunjukkan dalam Rajah 1.2.

.....

[1 mark/*1 markah*]

1

[Lihat sebelah

(ii) A sheep breeder wants to produce 30 identical sheep in his farm. By using your biological concept knowledge, name and explain the technique use by the sheep breeder.
Seorang penternak kambing ingin menghasilkan kambing yang sama sebanyak 30 ekor di ladangnya. Menggunakan konsep pengetahuan biologi anda, nama dan terangkan teknik yang digunakan oleh penternak tersebut.

.....

.....

.....

.....

.....

.....

[3 marks/*3 markah*]

3

Total A1

12

2 Figure 2.1 shows the organelles involve during the synthesis and secretion of an enzyme in an animal cell.

Rajah 2.1 menunjukkan organel yang terlibat semasa sintesis dan rembesan suatu enzim dalam sel haiwan.

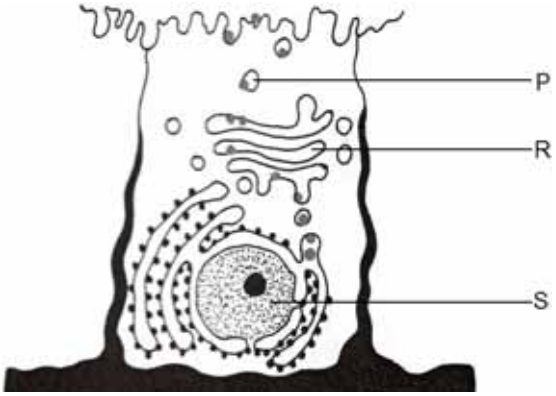


Diagram 2.1/*Rajah 2.1*

(a) Name the organelles labelled P and R
Namakan organel berlabel P dan R.

P: .....

R: .....

[2marks/ *2markah*] 2

(b) (i) Name the types on enzyme synthesised by the animal cell.
Namakan jenis enzim yang disintesiskan oleh sel haiwan tersebut.

.....

[1mark/*1markah*] 1

(ii) Give one example of enzyme named in (b) (i).
Berikan satu contoh enzim yang dinamakan dalam (b) (i).

.....

[1mark/ *1markah*] 1

[Lihat sebelah

(c) State the function of organelle S.
Nyatakan fungsi organel S.

.....

[1mark /*1markah*]

1

(d) Diagram 2.2 shows the structure of an enzyme and three substrates W, X and Y.
Rajah 4.2 menunjukkan struktur satu enzim dan substrat W, X dan Y.

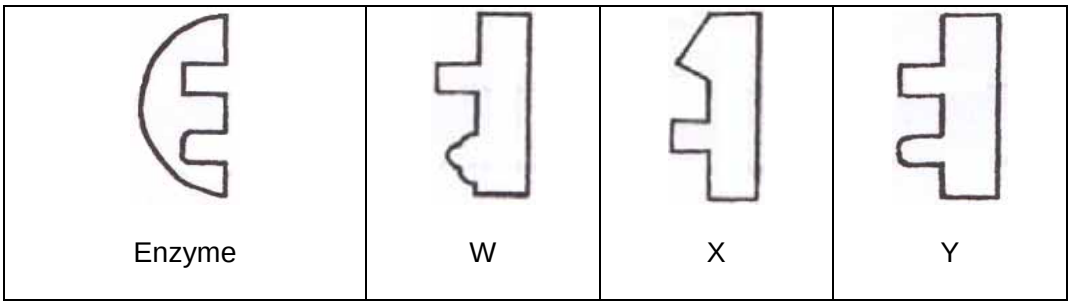
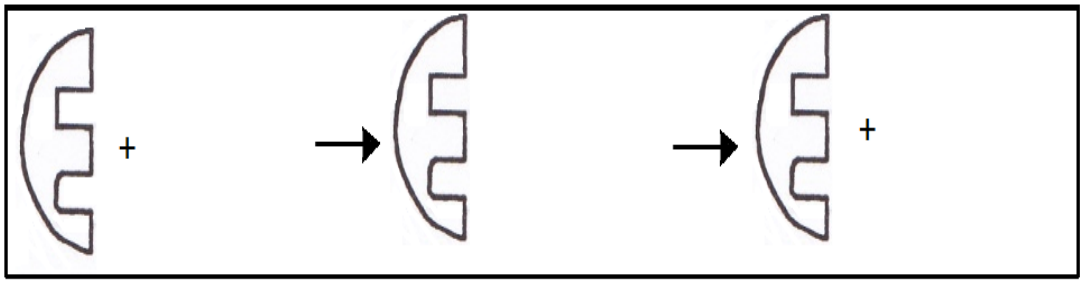


Diagram 2.2/ *Rajah 2.2*

Based on Diagram 2.2, complete the diagram below to show the mechanism of enzyme action on a suitable substrat.

Berdasarkan Rajah 2.2, lengkapkan rajah di bawah untuk menunjukkan mekanisma tindakan enzim ke atas substrat yang sesuai.



[3marks/*3 markah*]

3

[Lihat sebelah

(e)

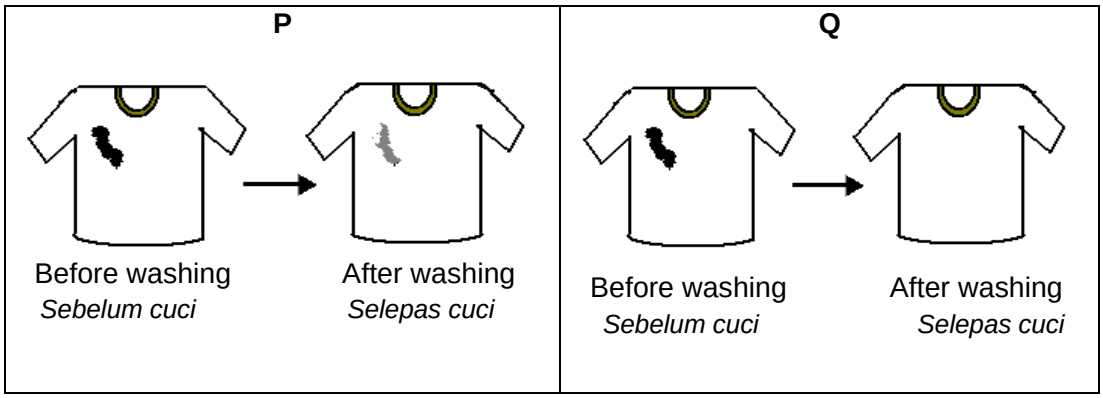


Diagram 2.3 /*Rajah 2.3*

Diagram 2.3 shows two shirts, P and Q that were stained with butter. The shirts were washed with washing powder that contains enzyme X at different temperatures.

Rajah 2.3 menunjukkan dua helai baju P dan Q yang dikotori oleh mentega. Baju tersebut dicuci dengan serbuk pencuci yang mengandungi enzim X pada suhu yang berbeza.

(i) What is enzyme X?
Apakah enzim X?

.....

[1mark / *1markah*]

1

(ii) What is the possible temperature that were used for Q? Explain your answer.
Apakah suhu yang mungkin telah digunakan untuk Q? Terangkan jawapan anda.

……

.....

……

[3marks/ *3markah*]

3

Total A2

12

[Lihat sebelah

3 Diagram 3 shows the relationship between two types of system and the body cells of human.
Rajah 3 menunjukkan hubungan antara dua jenis sistem dan sel-sel badan manusia.

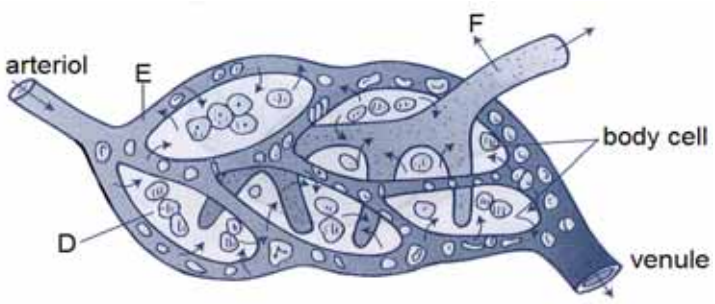


Diagram 3.1 /*Rajah 3.1*

a) Name fluid D and E.
Namakan bendalir D dan, E.

D: ……

E: ……

[2 marks/ 2 markah] 2

b) Explain how fluid D is formed.
Terangkan bagaimana bendalir D terhasil.

……

……

[2 marks/ *2 markah*] 2

c) Fluid E and F involve in the body`s defence system. Explain the defence mechanism of fluid F.
Bendalir E dan F terlibat dalam sistem pertahanan badan.Terangkan mekanisme pertahanan oleh bendalir F.

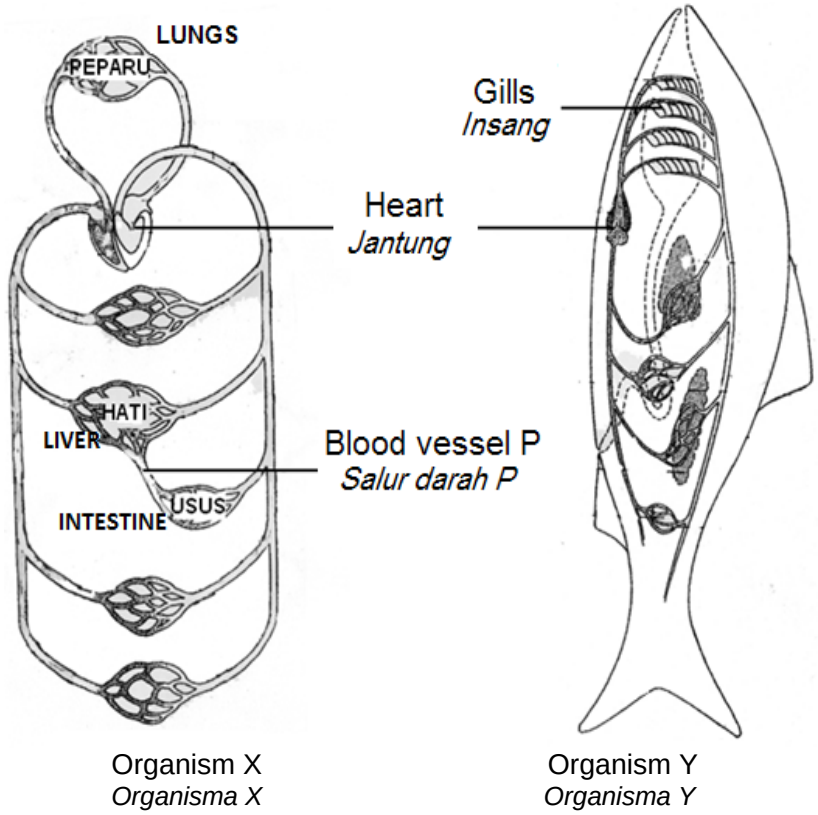
……

……

[2 marks/ *2 markah*] 2

[Lihat sebelah

Diagram 3.2 shows blood circulatory systems of organisms X and Y
Rajah 3.2 menunjukkan sistem peredaran darah organisma X dan organisma Y.



Organism X
Organisma X

Organism Y
Organisma Y

Diagram 3.2/*Rajah 3.2*

d) The type of blood circulatory system in organism X is complete double closed circulatory system. Based on this type of circulatory system, define the following terminologies.
Jenis sistem peredaran darah organisma X adalah tertutup, ganda dua dan lengkap. Berdasarkan jenis sistem peredaran darah tersebut, berikan maksud istilah berikut:

Double closed circulatory system
Sistem Peredaran Tertutup ganda dua

……

……

……

……

[2 marks/ *2 markah*]

2

[Lihat sebelah

e) By using arrow, (⟶) show the flow of oxygenated blood to all the organs in organism X and organism Y in Diagram 3.2.

Dengan menggunakan anak panah , (⟶) tunjukkan arah pengaliran darah beroksigen ke semua organ dalam organisma X dan organ organisma Y pada Rajah 3.2.

[2 marks/ *2 markah*]

2

f) The rate of oxygen supply to human body cells is faster and of large quantity than the rate of oxygen supply to the cells of a fish even though both of them are the same in size. Explain why.

Kadar pembekalan oksigen ke sel-sel badan manusia adalah lebih cepat dan banyak daripada kadar pembekalan oksigen ke sel-sel badan seekor ikan walaupun kedua-duanya mempunyai saiz badan yang sama.Terangkan mengapa.

……

……

……

……

[2 marks/ *2 markah*]

2

Total A3

12

[Lihat sebelah

4 Diagram 4.1 shows pedigree chart of a family for inheritance of earlobe types. Free earlobe is dominant (normal) represented by allele B while attached earlobe is recessive represented by allele b.

Rajah 4.1 menunjukkan carta pedigri sebuah keluarga bagi pewarisan ciri bentuk cuping telinga.Cuping telinga bebas adalah ciri dominan(normal) diwakili oleh alel B manakala cuping telinga melekap adalah ciri resesif diwakili oleh alel b.

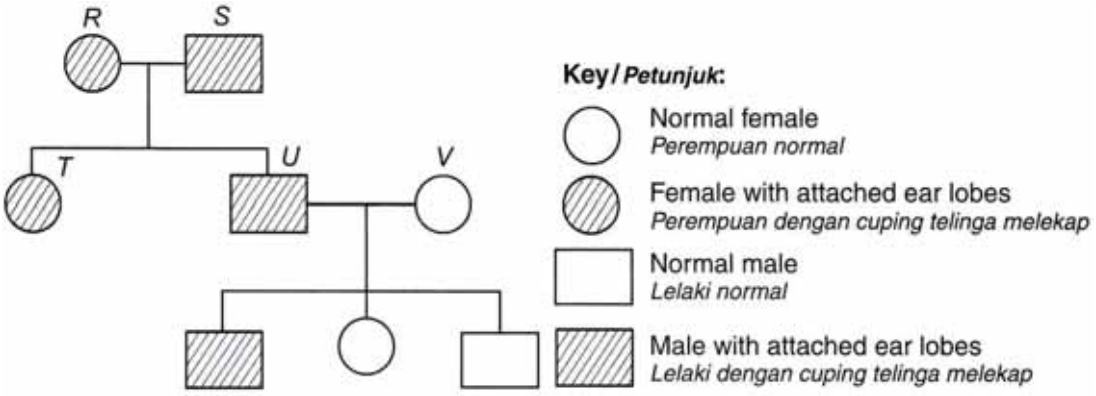


Diagram 4.1/*Rajah 4.1*

(a) (i) State the genotype for R and V.
Nyatakan genotip bagi R dan V.

R : .....

V :.....

[2marks/*2markah*] 2

(ii) How can the genotype of R be determined?
Bagaimana genotip R dapat ditentukan?

.....

.....

.....

.....

[2marks/*2markah*] 2

[Lihat sebelah

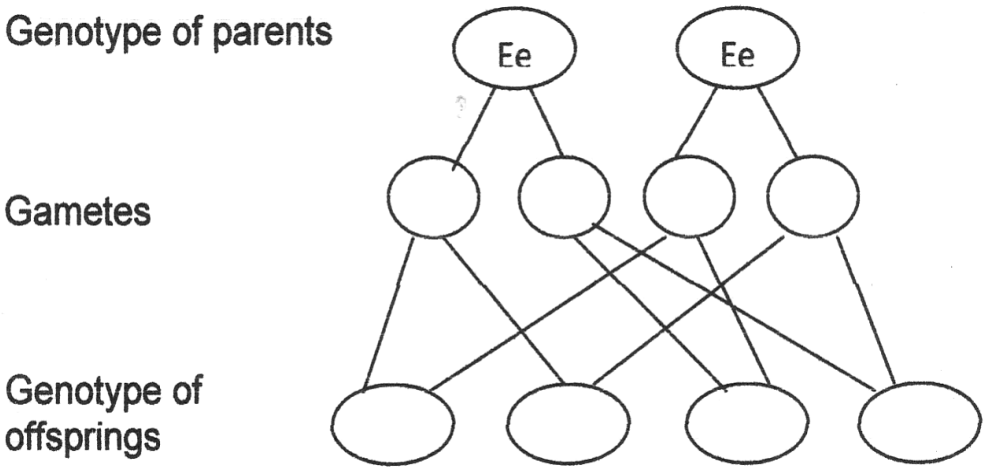
(b) What is the factor that causes the difference in the type of ear lobes among individuals?
Apakah faktor yang menyebabkan perbezaan jenis cuping telinga di kalangan individu?

……

……

[1mark/*1markah*] 1

(c) (i) If U and V have a fourth child, complete a schematic diagram of genetic cross below to show the possible genotype of their child.
Jika U dan V mempunyai anak keempat, lengkapkan rajah skema kacukan genetik di bawah bagi menunjukkan genotip yang mungkin bagi anak mereka .



[2marks/*2markah*] 2

[Lihat sebelah

(ii) What is the probability of getting a child with attached ear lobes?

Apakah kebarangkaliannya untuk mendapat anak yang mempunyai cuping telinga melekap?

……

……

[1 mark/*1mark*] 1

(d) (i) If T plans to marry and wants all of her children to have free earlobes, what is the possible genotype of her future husband?
Jika T bercadang untuk berkahwin dan inginkan semua anaknya mempunyai cuping telinga bebas, apakah genotip yang mungkin bagi bakal suami T.

……

……

[1mark/*1mark*] 1

(ii) Explain your answer in (d) (i)
Terangkan jawapan anda dalam (d) (i)

……

……

……

……

……

[3marks/*3marks*] 3

Total A4

12

[Lihat sebelah

5

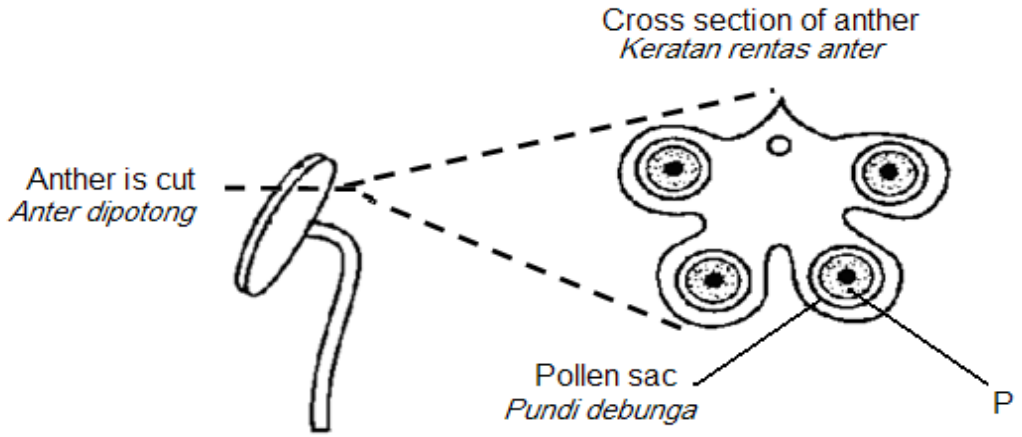


Diagram 5.1
Rajah 5.1

(a) Diagram 5.1 shows a cross section of an anther for a flowering plant.
Rajah 5.1 menunjukkan keratan rentas anter bagi sejenis tumbuhan berbunga.

(i) Name cell P that is found in the pollen sac.
Namakan sel P yang terdapat di dalam pundi debunga.

……

[1 mark/ *1 markah]*

1

(ii) Describe how cell P produced matured male gametes (pollen grains)?
Huraikan bagaimanakah sel P membentuk sel gamet jantan (debunga) yang matang?

……

……

……

……

[3 marks / 3 *markah*]

3

[Lihat sebelah

(b) Draw a diagram with labels to show a pollen grain structure while entering the style.

Lukiskan gambar rajah berlabel untuk menunjukkan struktur debunga semasa memasuki stil.

2

[2 *marks / 2 markah]*

(c) Figure below shows a longitudinal section of a female reproductive organ of a flower.

Rajah di bawah menunjukkan keratan memanjang bagi organ pembiakan betina bunga.

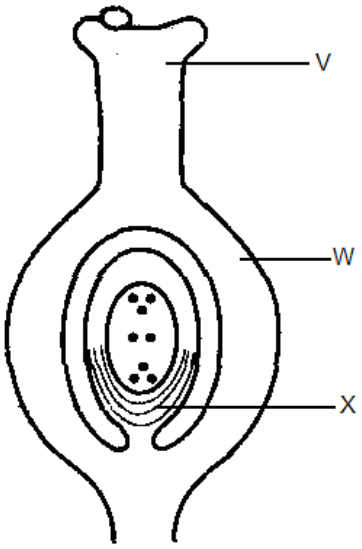


Diagram 5.2
Rajah 5.2

[Lihat sebelah

(i) Name the structure

Namakan struktur

W : ……

X : ……

[2 *marks* / *2 markah]*

2

(ii) Draw on Diagram 5.2 the development and growth of the pollen grains until it reaches the embryo sac.

Lukis pada Rajah 5.2 perkembangan dan pertumbuhan debunga sehingga tiba ke pundi embrio.

[2 *marks*] / [*2 markah]*

2

(d) Explain how the double fertilization takes place?
Terangkan bagaimanakah proses persenyawaan ganda dua terbentuk?

……

……

……

……

[2 *marks*/ *2 markah]*

2

Total A5

12

Section B
Bahagian B

[40marks/ *40 markah*]

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

6 (a) Diagram 6.1 shows an athlete is running on the track. Diagram 6.2 shows the graph of the rate of oxygen intake and oxygen debt.

Rajah 6.1 menunjukkan seorang atlet sedang berlari di atas trek. Rajah 6.2 menunjukkan graf kadar pengambilan oksigen dan hutang oxygen.

Diagram 6.1/ *Rajah 6.1*

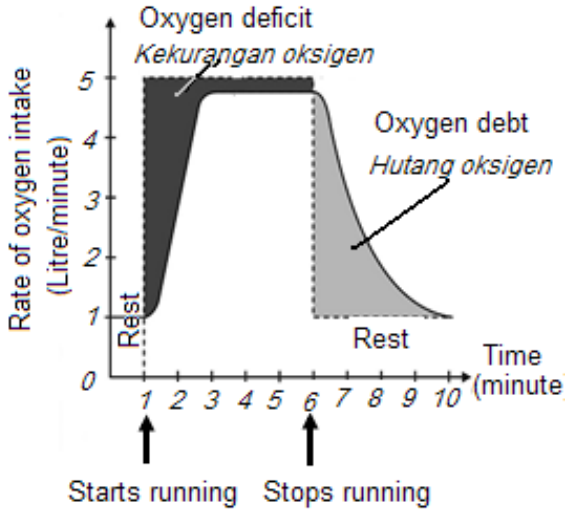


Diagram 6.2 / *Rajah 6.2*

Based on the above diagram and graph, describe how anaerobic respiration occurs in his muscle cells and until oxygen debt is paid.

Berdasarkan rajah dan graf di atas, huraikan bagaimana respirasi anaerob berlaku sehingga hutang oksigen dalam sel-sel ototnya dibayar .

[10 marks/*10 markah*]

[Lihat sebelah

(b) Diagram 6.3 shows respiratory surface X and Y for two different organisms.

Rajah 6.3 menunjukkan permukaan respirasi X dan Y bagi dua organisma berbeza..

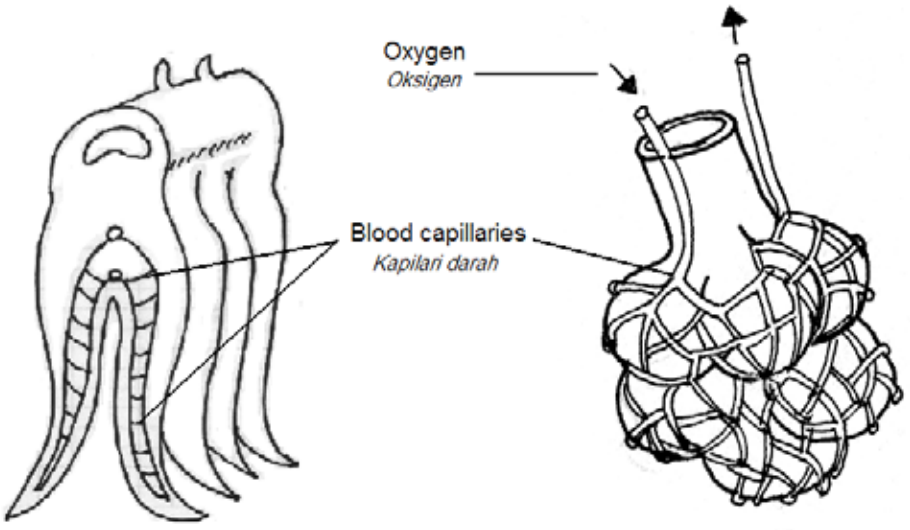


Diagram 6.3/ *Rajah 6.3*

(i) Name one organism for each respiratory surface X and Y in diagram 6.3

Namakan satu contoh organisma bagi setiap satu permukaan respirasi X dan Y dalam Rajah 6.3.

[2 marks/ 2 markah]

(i) Explain the characteristics of respiratory surfaces X and Y as adaptation for gases exchange.

Terangkan sifat-sifat yang terdapat pada permukaaan respirasi X dan Y sebagai penyesuaian untuk pertukaran gas.

[8 marks/8 *markah*]

[Lihat sebelah

7. Diagrams 3.1 (a) and 3.1 (b) show two types of variation investigated among students.
Rajah 3.1(a) dan 3.1(b) menunjukkan dua jenis variasi yang telah dikaji dalam kalangan pelajar.

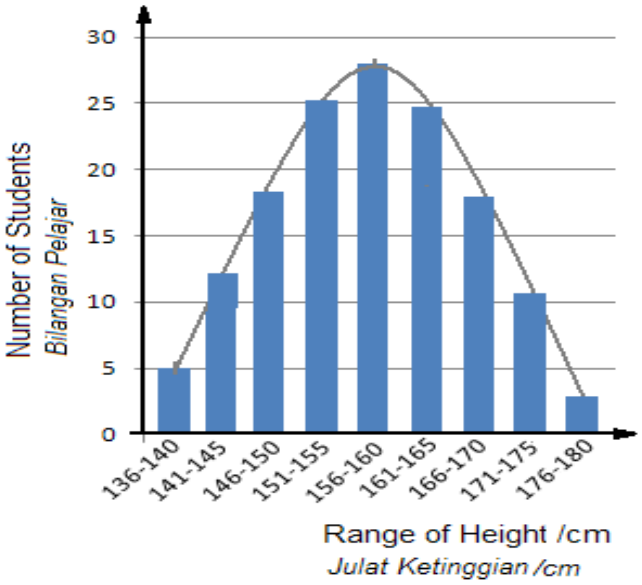


Diagram 3.1(a) / *Rajah 3.1 (a)*

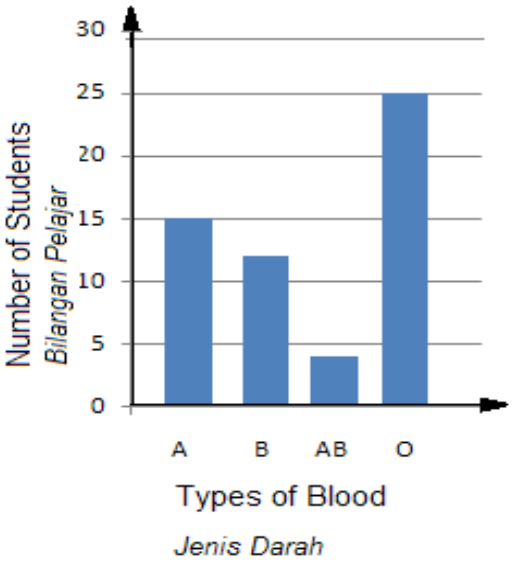


Diagram 3.1(b)
Rajah 3.1 (b)

[Lihat sebelah

(a). Name the types of variation shown in Diagrams 3.1 (a) and 3.1 (b) and describe both types of variation.
Namakan jenis variasi yang ditunjukkan dalam Rajah 3.1(a) dan 3.1(b) dan huraikan kedua-dua jenis variasi.

[4 marks/ *4 markah*]

(b). Using suitable example of variation, explain how environmental factor causes that variation.
Dengan memberikan contoh variasi yang sesuai, terangkan bagaimana faktor persekitaran menyebabkan variasi tersebut.

[6 marks/ *6 markah*]

(c). Colour blindness is a recessive trait which is inherited through the X chromosome. In a family, the mother is a carrier of the trait while the father has normal vision.

Buta warna adalah ciri resesif yang diwarisi melalui kromosom X. Dalam sebuah keluarga, ibu ialah pembawa manakala bapa adalah seorang yang mempunyai penglihatan normal.

Using a schematic diagram explain how colour blindness could occur in the family.

Dengan menggunakan rajah skema, terangkan bagaimana buta warna boleh berlaku dalam keluarga ini.

Keys/ *Petunjuk* : B - allele for normal vision/ *alel untuk penglihatan normal*

b - allele for colour blindness/ *alel untuk buta warna*

[10 marks/ *10 markah*]

[Lihat sebelah

8 The pituitary gland is regarded as the 'master' endocrine gland.
Kelenjar pituitari dikenali sebagai kelenjar utama.

(a) Explain the statement above.
Terangkan pernyataan di atas.

[2 marks/*2 markah*]

(b) After watching a horror movie at a cinema, Aisyah returned home. On the way home, she saw a monster exactly the same like the monster she watched in the movie. She was very shocked and frightened so she ran away as fast as she could.

Selepas menonton cerita seram di panggung, Aisyah pulang ke rumahnya.Semasa perjalanan pulang, dia ternampak satu lembaga seakan-akan lembaga yang ditonton dalam cerita tadi. Dia sangat terkejut dan takut lalu berlari sekuat yang dia mampu.

Explain the coordination involving both the nervous system and endocrine system in a 'fight or flight' situation.

Terangkan koordinasi antara sistem saraf dan sistem endokrin yang terlibat di dalam situasi 'melawan/melepaskan diri' tadi.

[8 marks/*8 markah*]

[Lihat sebelah

(c)

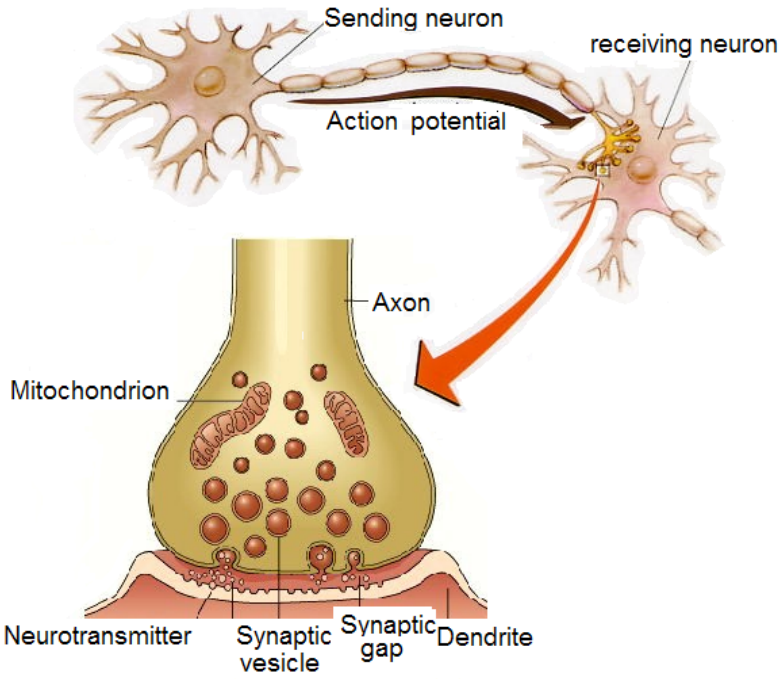


Diagram 8.1/*Rajah 8.1*

(i) Based on diagram 8.1, state what synapse is? Explain how the nerve impulse is transmitted across a synapse?

Berdasarkan Rajah 8.1, nyatakan apakah sinaps? Terangkan bagaimana impuls saraf dihantar merentasi sinaps.

[6 marks / *6 markah]*

(ii) Alzheimer's and Parkinson's diseases are related to nervous system.

Penyakit Alzheimer's dan Parkinson's adalah penyakit yang berkaitan sistem saraf.

Explain the causes and the effects of the diseases on victims.

Terangkan sebab-sebab dan kesan-kesan penyakit tersebut ke atas mangsa.

[4 marks / *4 markah]*

[Lihat sebelah

9(a) What is biodiversity? Give **two** reasons why it is important.

*Apakah yang dimaksudkan dengan biodiversity? Nyatakan **dua** sebab mengapa ianya penting.*

[4 marks/ *4 markah]*

(b) Diagram 9.1 shows type of interaction between two organisms in an ecosystem.

Rajah 9.1 menunjukkan sejenis perhubungan antara dua organisma di dalam satu ekosistem.

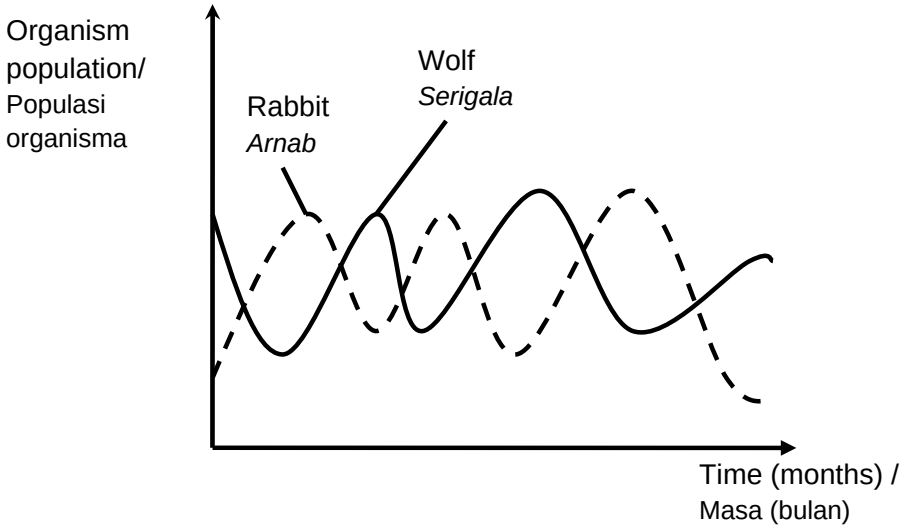


Diagram 9.1/*Rajah 9.1*

Explain how the interaction between the two organisms controls each other population.

Terangkan bagaimana perhubungan di antara dua organisma mengawal populasi kedua-duanya.

[6 marks / *6 markah]*

[Lihat sebelah

Diagram 9.2 shows one industrial area that emits smoke that comes from burning of fossil fuel to atmosphere.

Rajah 9.2 menunjukkan satu kawasan industri yang membebaskan asap hasil daripada pembakaran bahan api fosil ke persekitaran.

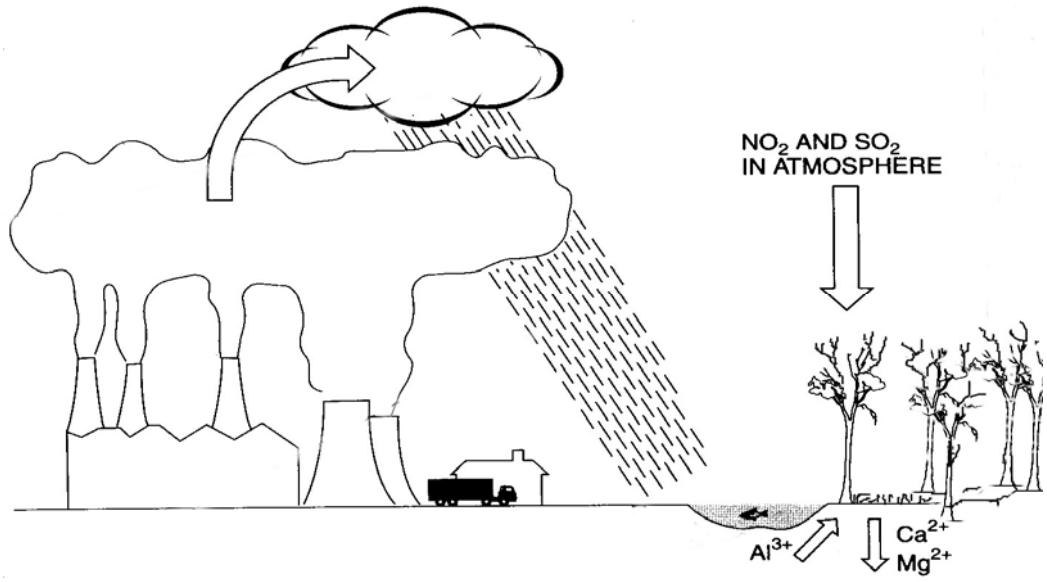


Diagram 9.2/*Rajah 9.2*

(c) (i) Name the phenomenon shows in the diagram 9.2 and describe how it occur.

Namakan kejadian yang ditunjukkan dalam rajah 9.2 dan huraikan bagaimana fenomena tersebut berlaku.

[4 *marks/ 4 markah]*

(ii) Describe the effect of the phenomenon that you have stated in (c)(i) for lives in an ecosystem

Huraikan kesan kejadian yang anda nyatakan di(c)(i) pada hidupan dan ekosistem.

[6 *marks/ 6 markah]*

KERTAS SOALAN TAMAT

[Lihat sebelah

Nama: ……

Tingkatan: …… No Kad Pengenalan: ……

PEPERIKSAAN PERCUBAAN BERSAMA
SIJIL PELAJARAN MALAYSIA 2012
ANJURAN

MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
CAWANGAN PERLIS

BIOLOGI

Kertas 3

Satu jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Tulis **nama** anda pada ruang yang disediakan.
2. Kertas soalan ini adalah dalam dwibahasa.
3. Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.
4. Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam Bahasa Melayu atau Bahasa Inggeris.
5. Calon dikehendaki membaca maklumat di halaman 11.

Kod pemeriksa		
Soalan	Markah penuh	Markah diperoleh
1	33	
2	17	
Jumlah	50	

Kertas soalan mengandungi 11 halaman bercetak termasuk kulit.

INFORMATION FOR CANDIDATES

1. This question paper consists of two questions. Answer **all** questions.
2. Write your answers for **Question 1** in the spaces provided in the question paper.
3. Write your answers for **Question 2** on the 'helaian tambahan' provided by the invigilators. You may use equations, diagrams, tables, graphs and other suitable methods to explain your answer.
4. Show your working, it may help you to get marks.
5. If you wish to change your answer, neatly cross out the answer that you have done . Then write down the new answer.
6. The diagrams in the questions are not drawn to scale unless stated.
7. Marks allocated for each question or part of the question are shown in brackets.
8. The time suggested to answer **Question 1** is 45 minutes and **Question 2** is 45 minutes.
9. You may use a non programmable scientific calculator.
10. Hand in all your answer sheets at the end of the examination.

Marks awarded:

Score	Description
3	**Excellent** : The best response
2	**Satisfactory** : An average response
1	**Weak** : An inaccurate response
0	No response or wrong response

Answer **all** questions.

Jawab **semua** soalan.

1 .

A group of students have conducted an experiment to investigate how the different of water intake influence the urine production. The volume of water intake and urine produced after half an hour is shown in Table 1.1. This experiment is repeated twice.

Sekumpulan pelajar telah menjalankan eksperimen untuk mengkaji bagaimana pengambilan air yang berbeza mempengaruhi penghasilan air kencing. Isipadu air yang diambil dan air kencing yang dihasilkan selepas setengah jam ditunjukkan di dalam Jadual 1.1. Eksperimen ini diulangi sebanyak 2 kali.

Table 1.1 shows the volume of water intake and the urine produced after half an hour.

Jadual 1.1 menunjukkan isipadu air yang diambil dan air kencing yang dihasilkan selepas setengah jam.

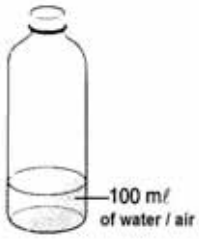
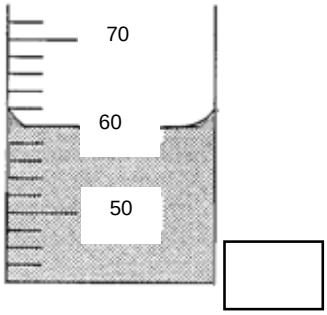
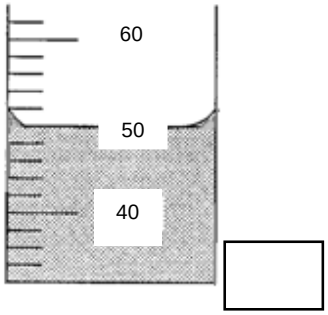
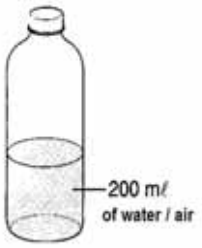
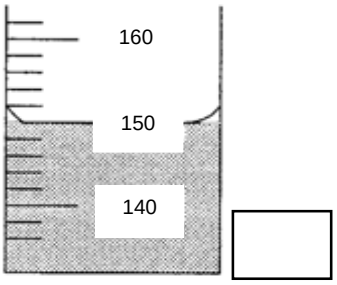
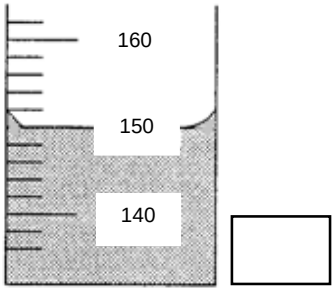
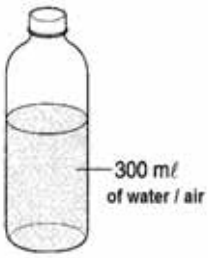
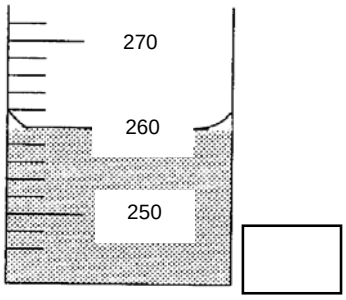
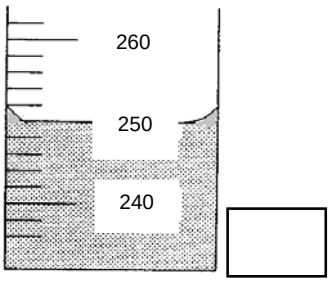
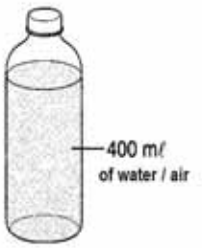
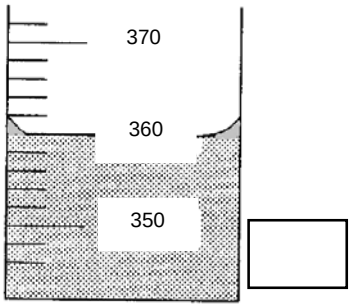
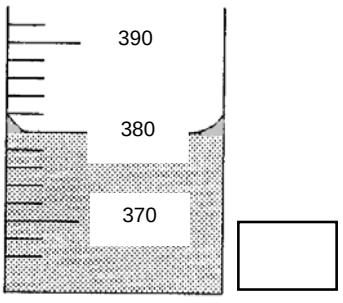
Student *Pelajar*	Volume of water intake (ml) *Isipadu air yang diambil (ml)*	Volume of urine produced *(ml)* *isipadu air kencing yang terhasil (ml)*	
		First experiment *Eksperimen pertama*	Second experiment *Eksperimen kedua*
A			
B			
C			
D			

Table 1.1

Jadual 1.1

  [Lihat sebelah

(a) Complete Table 1.1 to show the volume of urine production after half an hour.

Lengkapkan Jadual 1.1 untuk menunjukkan isipadu air kencing yang terhasil selepas setengah jam.

[3 marks / *3 markah*]

(b) (i) State **two** observations that can be made from this experiment based on Table 1.1

*Nyatakan **dua** pemerhatian yang boleh dibuat daripada eksperimen berdasarkan Jadual 1.1*

Observation 1 / *Pemerhatian 1:*

……

……

Observation 2 / *Pemerhatian 2:*

……

……

[3 marks / *3 markah*]

(ii) State the inferences from the observations in 1 (b) (i)

Nyatakan inferens daripada pemerhatian di 1 (b) (i)

Inference from observation 1 / *Inferens daripada pemerhatian 1:*

……

……

Inference from observation 2 / *Inferens daripada pemerhatian 2:*

……

……

[3 marks / *3 markah*]

  [Lihat sebelah

(c) Complete Table 1.2 based on this experiment.

Lengkapkan Jadual 1.2 berdasarkan eksperimen ini.

Variable *Pembolehubah*	Method to handle variable *Cara mengendali pembolehubah*
Manipulated variable: *Pembolehubah dimanipulasi* …… ……	…… ……
Responding variable: *Pembolehubah bergerakbalas* …… ……	…… ……
Constant variable: *Pembolehubah dimalarkan* …… ……	…… ……

Table 1.2

Jadual 1.2

[3 marks / *3 markah*]

(d) State the hypothesis for this experiment.

Nyatakan hipotesis bagi eksperimen ini.

……

……

[3 marks / *3 markah*]

  [Lihat sebelah

(e) (i) Construct a table and record all the data collected in this experiment.
Bina satu jadual dan rekodkan semua data yang dikumpul dalam eksperimen ini.

Your table should have the following aspects.
Jadual anda hendaklah mengandungi aspek- aspek berikut:

-Student/ *pelajar*

-Volume of water intake / *Isipadu air yang diambil*

-Volume of urine produced/ *isipadu air kencing yang terhasil*

- Average of volume of urine produced / *Purata isipadu air kencing yang terhasil*

- Percentage of urine produced / *Peratus air kencing yang terhasil*

Percentage of urine produced *Peratus air kencing yang dihasilkan*	=	Volume of urine produced X 100% Volume of water intake *Isipadu air kencing terhasil X 100%* *Isipadu air yang diambil*

[3 marks / *3 markah*]

(ii) Use the graph paper provided on page 8 to answer this question. Using the data in 1(e) (i) draw a line graph of the percentage of urine produced against volume of water intake.

Guna kertas graf yang disediakan di halaman 8 untuk menjawab soalan ini. Dengan menggunakan data di 1(e) (i) lukis satu graf garis bagi peratusan air kencing yang terhasil melawan isipadu air yang diambil.

[3 marks 3 markah]

(f) Based on the line graph in 1 (e) (ii), explain the relationships between the volume of water intake to the percentage of urine produced .

Berdasarkan graf garis dalam 1(e) (ii), terangkan perkaitan isipadu pengambilan air dengan peratusan air kencing yang dihasilkan..

……

……

[3 marks / *3 markah*]

(g) State the operational definition of urine production based on this experiment.

Nyatakan definisi secara operasi bagi penghasilan air kencing berdasarkan eksperimen ini.

……

……

……

[3 marks / *3 markah*]

(h) If the experiment is repeated by replacing 100 ml of plain water with 100 ml of 5% of sodium chloride solution, predict the volume of urine produced by the student for half an hour. Explain your prediction.

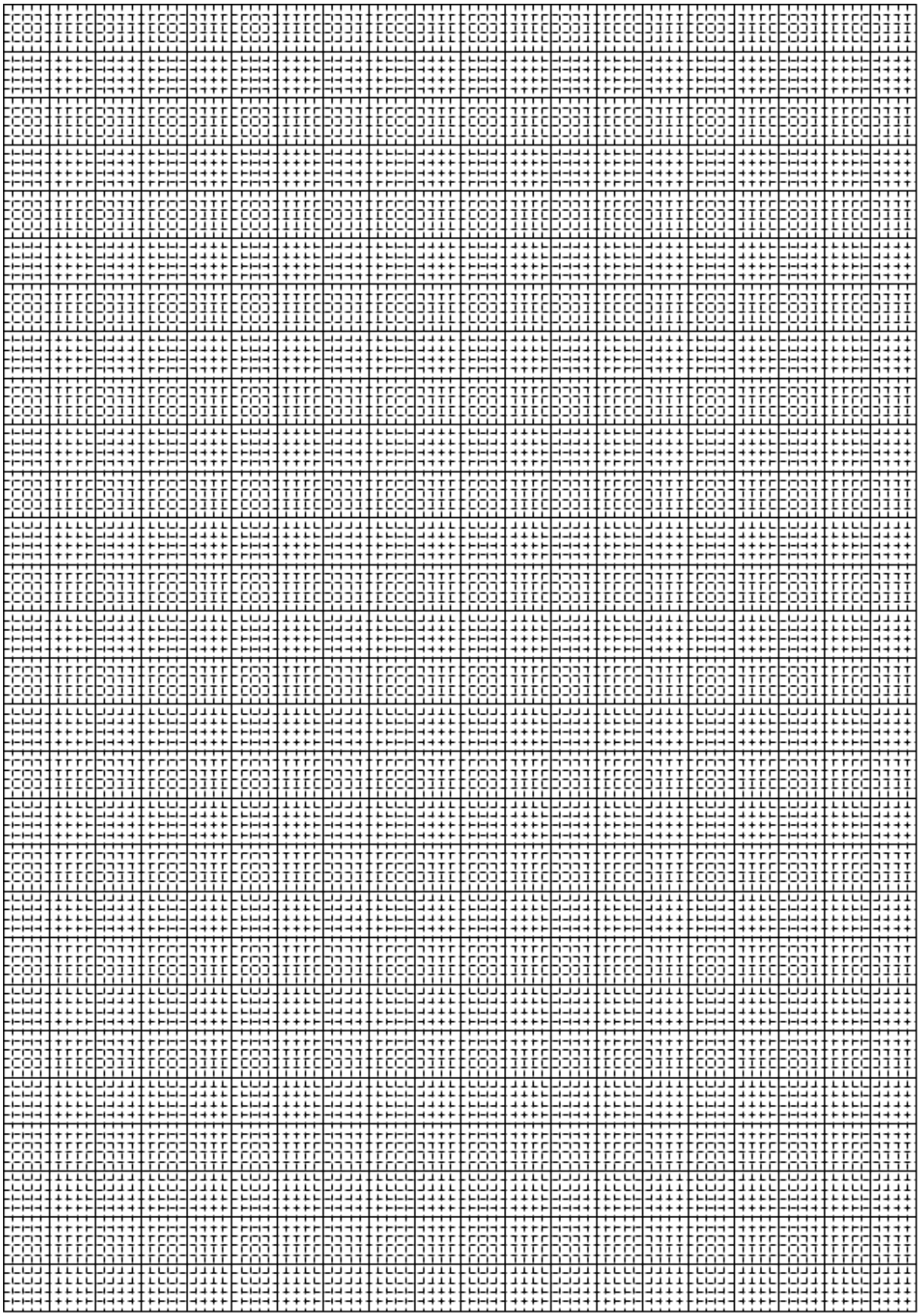
Jika ekperimen ini diulang dengan menggunakan 100 ml larutan natrium klorida 5% bagi menggantikan 100 ml air kosong, ramalkan isipadu air kencing yang dihasilkan oleh pelajar selepas setengah jam. Terangkan ramalan anda.

……

……

……

[3 marks / *3 markah*]



  [Lihat sebelah

(i) The following list is part of the materials and apparatus used in this experiment.

Senarai berikut adalah sebahagian daripada bahan dan radas yang digunakan dalam eksperimen ini.

Measuring cylinder *Silinder penyukat*	Drinking water *Air minuman*
Drinking bottle *Botol minuman*	Stopwatch *Jam randik*
Urine *Air kencing*	

Complete table1.3 based on the list given above.

Lengkapkan jadual berdasarkan senarai yang diberikan di atas.

Apparatus / *Radas*	Materials / *Bahan*

Table 1.3

Jadual 1.3

[3 marks / *3 markah*]

2.

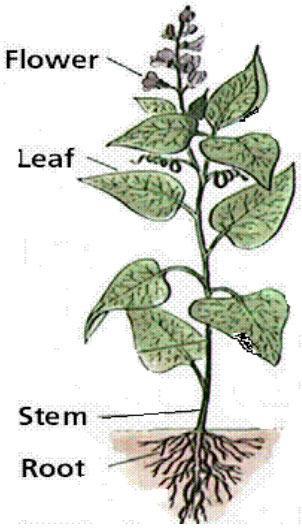


Diagram 2 / *Rajah 2*

Plant needs macronutrients and micronutrients to grow healthy and reproduce. Nitrogen, phosphorus and potassium are most important.
By using a suitable plant that can absorb nutrient from nutrient solution (aquaculture), design an experiment to show the effect of nitrogen, phosphorus and potassium deficiency on this plant. The planning of your experiment must include the following aspects:

Tumbuhan memerlukan makronutrien dan mikronutrien untuk tumbuh dengan sihat dan membiak. Nitrat, fosforus dan kalium adalah antara yang penting.
Dengan menggunakan tumbuhan sesuai yang dapat menyerap nutrien dari larutan nutrien (akuakultur), reka bentuksatu eksperimen untuk menunjukkan kesan kekurangan nitrogen, fosforus dan kalium terhadap tumbuhan ini.
Perancangan eksperimen anda hendaklah meliputi aspek-aspek berikut:

- Problem statement / *Pernyataan masalah*
- Hypothesis / *Hipotesis*
- Variables / *Pembolehubah*
- List of apparatus and material / *Senarai radas dan bahan*
- Experimental procedure / *Kaedah eksperimen*
- Presentation of data / *Persembahan data*

[17 marks / *17 markah*]

END OF QUESTION PAPER

PEPERIKSAAN PERCUBAAN BERSAMA
SPM 2012 PERLIS
BIOLOGY
PAPER 1 ANSWER SCHEME
SKEMA JAWAPAN KERTAS 1

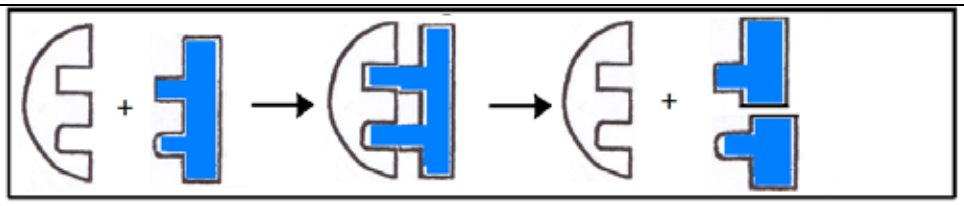
1. C	2. C	3. B
4. A	5. B	6. C
7. C	8. B	9. C
10. B	11. A	12. D
13. D	14. C	15. D
16. A	17. A	18. A/B
19. A	20. A	21. C
22. A	23. B	24. B
25. A	26. B	27. D
28. C	29. C	30. D
31. A	32. B	33. C
34. D	35. D	36. C
37. B	38. D	39. A/D
40. B	41. D	42. D
43. C	44. B	45. C
46. B	47. C	48. B
49. A	50. A	

Suggested Answer for structured question: Section A:

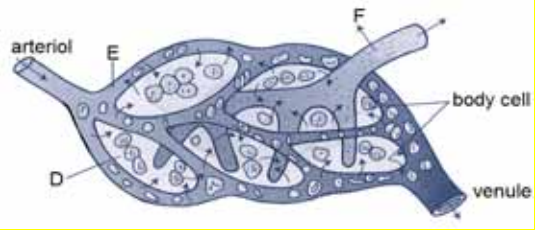
Question 1:

Item No	Marking Criteria	Marks
1(a)	A : smooth endoplasmic reticulum B : mitochondria/ mitochondrion **(correct spelling is mandatory)**	1 1 **(2 marks)**
(b) (i)	Processing, packaging and transporting centre of carbohydrates, proteins, phospholipids and glycoprotein.	1 1 **(2 marks)**
(ii)	Amylase **(Any digestive enzymes)**	1
(iii)	- The modified protein are package into vesicles - Vesicles containing these products bud off from the Golgi membranes - And diffuse out of cell/plasma membrane	1 1 1
(c) (i)	Mitosis	1
(ii)	- Cloning - The nucleus from somatic cell is transfer to an ovum with the nucleus removed - The daughter cell produce are identical to parent cells	1 1 1
		Total = 12 marks

Question 2:

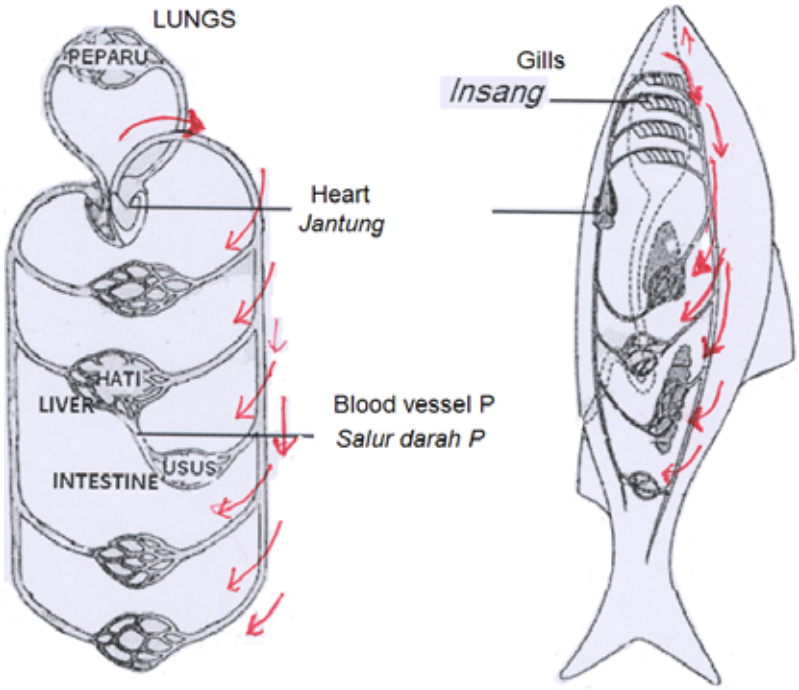
Item No	Marking Criteria	Marks	
(a)	P : Transporting vesicle / vesicle R : Golgi body	1 1	2
(b)(i)	Intercellular enzyme	1	1
(ii)	Lipase / amylase / tripsin	1	1
(c)	Store genetic informations/ control cell activities	1	1
(d)(i)		3	3
(e) (i)	Lipase	1	1
(ii)	Temperature at 35^0C – 40^0C This is the optimum temperature for enzyme activity, the rate of enzyme reaction is maximum and the give the effective wash.	1 1 1	3
	TOTAL	**12**	

Question 3:

Item No	Marking Criteria	Marks
3 a)	 *Q: Name fluid D and E* D : interstitial fluid E : Blood plasma	2 **(2 marks)**
b)	*Q: Explain how fluid D is formed.* The high hydrostatic pressure in the arteriole (capillary) causes part of the blood plasma to diffuse out of the capillary into the spaces between body cells. The fluid in the spaces between the body cells is fluid D.	1 1 **(2 marks)**
c)	*Q: Fluid E and F involve in the body`s defence system. Explain the defence mechanism of fluid F.* Fluid F is the lymph which has many leucocytes such as phagocytes and lymphocytes. The phagocytes destroy pathogens by phagocytosis (while) lymphocytes destroy pathogens by producing specific antibody to react with the antigens / pathogens. **any two**	1 1 1 **(2 marks)**
d)	*Q: Berdasarkan jenis sistem peredaran darah tersebut, berikan maksud istilah berikut:* *System peredaran Tertutup ganda dua* Doubled // **gandadua** blood flows into the heart twice for every complete circulation// darah mengalir ke dalam jantung sebanyak dua kali bagi setiap kitar peredaran darah yang lengkap Closed// **tertutup** blood flows in specific vessels// Darah yang mengalir dalam salur-salur darah tertentu	1 1 **(2 marks)**

e)

By using arrow, (⟶) show the flow of oxygenated blood to all the organs in organism X and organism Y in Diagram 3.2.



Anak panah menunjukkan pengaliran darah beroksigen ke **semua organ dalam organisma X dan Y.**

Able to draw arrows that show the direction of oxygenated blood flow// Dapat melukiskan anak panah menunjukkan arah pengaliran darah beroksigen ke semua organ

2 **(2 marks)**

f)

	Manusia	Ikan
F1	Sistem peredaran darah ganda dua	Sistem peredaran darah tunggal
F2	Darah beroksigen dipam terus dari jantung ke sel-sel badan	Darah dipam dari jantung ke insang dan dari insang ke sel-sel badan
F3	Tekanan darah yang membawa oksigen tinggi	Tekanan darah yang membawa oksigen rendah
F4	Eritrosit manusia membawa banyak oksigen	Eritrosit membawa kurang oksigen

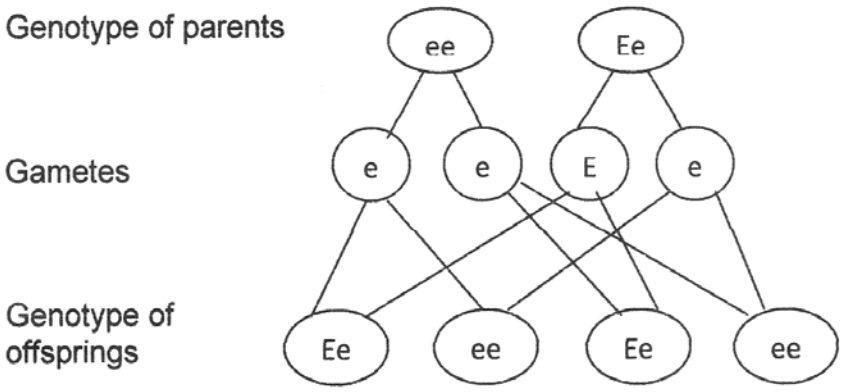
Mana-mana dua F

2 **(2 marks)**

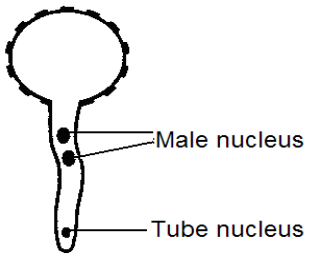
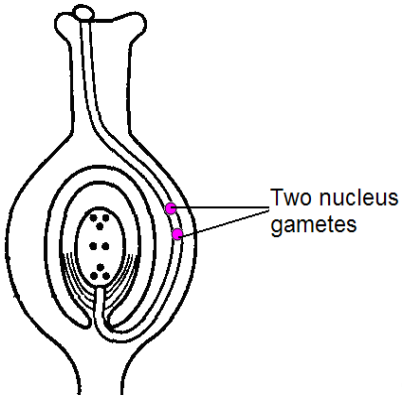
TOTAL 12 MARKAH

Question 4:

Question 4

No	Marking Criteria	Marks	
4 (a)(i)	R: ee V: Ee	1 1	 2
(ii)	The attached ear lobe characteristic is controlled by the recessive allele. R with attached ear lobe must be recessive homozygous (ee) to exhibit the attached ear lobe characteristics.	1 1	 2
(b)	Genetic factor		1
(c)(i)		1 1	 2
(ii)	50% atau 1/2	1	1
(d) (i)	EE	1	1
(ii)	The genotype of T is ee because she has attached ear lobes, and the female gamete has only allele e. When the genotype of her future husband is EE, the male gamete has only allele E. For each fertilisation , the genotype of the zygote produce is Ee which exhibits free ear lobes.	1 1 1 1	 Max 3m
	TOTAL	**12**	

Question 5:

Item No	Marking Criteria	Marks
5(a)	(i) Pollen mother cells (2n) // microsporocyte(2n)	**1**
	Diagram 5.1 shows a cross section of an anther for a flowering plant. (ii) P1: (In the pollen sac), microspore cells that are diploid (2n) will undergo **meiosis** to produce tetrad haploid pollen (n). P2: pollen **nucleus** (n) will undergo **mitosis** to produce two types of haploid nucleus, P3: that are generate nucleus and tube nucleus (male gamete cell // matured pollen)	**1** **1** **1**
(b)	*Q: Draw a diagram with labels to show a pollen grain structure while entering the style.*  	**1** **1**
(c)	(i) W : Ovary X : Integument layer //ovule coats	**1** **1**
	(ii)  Complete tube - 1m	**1** **1** **2 marks**
(d)	P1: (Double fertilization occur), where one of the male gamete nucleus fuses with the egg cell to produce diploid zygote P2: and the other one male gamete nucleus fuses with both polar nuclei to form triploid zygote. **JUMLAH MARKAH**	**1** **1** **12**

Answer scheme for essay: Section B:

Question 6:

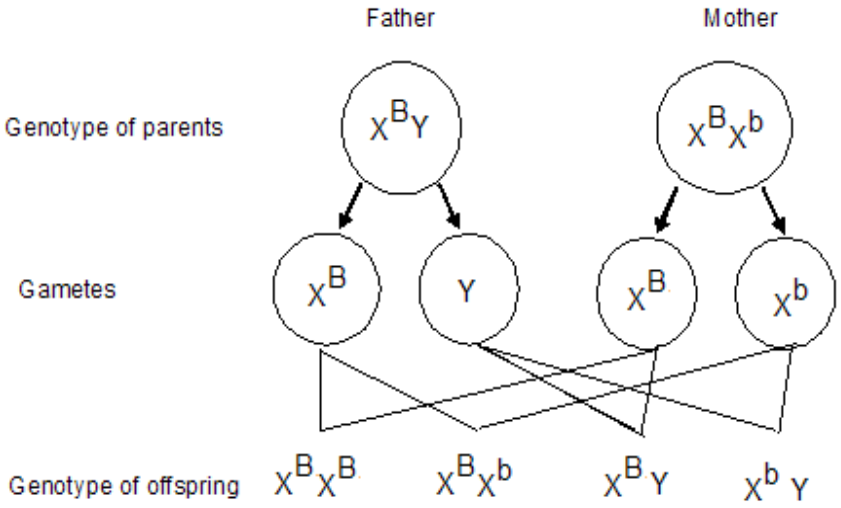
Item No	Marking Criteria	Marks	
6 (a)	- semasa menjalankan aktiviti cergas pada minit 1 hingga ke 6, kadar denyutan jantung dan kadar respirasi akan meningkat	1	
	-supaya lebih banyak oksigen dapat dibekalkan ke sel-sel otot	1	
	-oleh kerana kadar penggunaan oksigen oleh melebihi kuantiti oksigen yang dibekalkan	1	
	-otot masih berada dalam keadaan kekurangan oksigen / mengalami hutang oksigen.	1	
	- otot terpaksa berespirasi secara anaerob	1	
	-untuk menghasilkan tenaga tambahan yang diperlukan	1	
	-semasa respirasi anaerob molekul glukosa diurai secara separa/tidak lengkap	1	
	-yang menghasilkan asid laktik di dalam sel otot	1	
	-tenaga yang dihasilkan adalah kurang kerana sebahagian tenaga masih terikat dalam asid laktik	1	
	-pengumpulan asid laktik yang tinggi dalam sel otot menyebabkan sel otot menjadi letih/ kejang	1	
	-aktiviti pernafasan perlu dipertingkatkan / menjadi tercungap-cungap pada minit ke 6	1	
	-supaya lebih banyk oksigen dibekalkan untuk mengoksidakan asid laktik [kepada karbon dioksida, air dan tenaga	1	
	- apabila semua asid laktik telah disingkirkan [melalui pengambilan oksigen tambahan,]	1	
	- hutang oksigen dikatakan dibayar pada minit ke 10	1	Max 10m

6(b) (i)	Contoh organisma X : ikan Contoh organism Y : Manusia / Katak dan rakan-rakan / burung drr / ular drr	1 1	Max 2m
(ii)	*Fakta (F)* / *Penerangan (P)* (see table below)	2 2 2 2	Max 8m

Fakta (F)	*Penerangan (P)*
F1- Permukaan respirasi X mempunyai banyak unjuran nipis dan pipih , dan Y mempunyai bilangan yang banyak	*P1-untuk menambahkan keluasan permukaan bagi pertukaran gas*
F2 - Permukaan respirasi X dan Y sentiasa lembab	*P2- bagi memastikan gas respirasi dapat melarut sebelum meresap ke dalam atau keluar dari permukaan respirasi tersebut*
F3 - Permukaan respirasi X dan Y terdiri daripada lapisan permukaan dinding yang nipis	*P3 -bagi mempercepatkan proses resapan gas respirasi*
F4 - Permukaan respirasi X dan Y dilingkari oleh jaringan kapilari darah	*P4- untuk memastikan resapan dan pengangkutan gas respirasi berlaku dengan lebih cepat*

Question 7:

Item No	Marking Criteria	Marks
7.(a)	**F1: Rajah 3.1 (a) :- Variasi selanjar/ Variasi kuantitatif** **F2: Rajah 3.2 (b) :- Variasi tidak selanjar/ Variasi kualitatif** E1: tidak dapat menunjukkan perbezaan yang jelas/diskrit dan dipengaruhi oleh faktor genetic dan persekitaran.// E2: mempunyai ciri-ciri perantaraan (sederhana) antara satu ekstrem dengan ekstrem yang lain.// E3: mempunyai bentuk graf yang normal// E4: Boleh berubah bergantung kepada perubahan persekitaran. Contoh: Bilangan pelajar yang sangat tinggi dan pelajar sangat rendah dalam Rajah 3.1 (a) adalah sedikit berbanding dengan pelajar yang mempunyai ketinggian yang sederhana.	1 1 **(2 marks)** 1 1 1 1 1 any two **(2 marks)**
(b).	**F1: Variasi yang dipengaruhi oleh faktor persekitaran adalah variasi selanjar.** Continuous variation // Variasi selanjar is Mandatory **F**2: Variation caused by environmental factor cannot be inherited. E1: Example: (Any suitable example) dalam kalangan manusia ialah berat badan dan warna kulit. Haiwan – berat badan, panjang, ukur lilit dsb. Tumbuhan – panjang daun, tinggi pokok, ukur lilit batang, saiz buah dsb. **Suggested Answer: size of the plant (E1)** E2: Depends on the changes of the environment such as light intensity, water and fertilizers. **F3**: The plant that grows under direct sunlight can carry out photosynthesis at maximum rate while the plant that grows under shelter has limited exposure to the sunlight and therefore photosynthesizes at lower rate. E3: The plant that grows under direct sunlight might grow faster compared to the plant that grows under shelter. (Terima mana-mana contoh dan penerangan yang sesuai)	1 1 1 1 1 1 1 Max 6 **(6 mark)**

(c).	 Phenotype of offsprings: X^BX^B Anak perempuan normal X^BX^b Anak perempuan pembawa gen terangkai jantina buta warna X^BY Anak lelaki normal X^bY Anak lelaki buta warna Peratus keluarga ini mendapat anak buta warna ialah: 25% 50% daripada anak lelaki akan mengalami buta warna manakala 50% lagi akan mempunyai penglihatan normal. Ini kerana anak lelaki mewarisi kromosom X dari ibunya sahaja iaitu samada X^B atau X^b Olehkerana gen buta warna adalah terangkai pada kromosom X, maka anak perempuan tidak mengalami buta warna kerana anak perempuan mempunyai sepasang kromosom X, iaitu satu dari ibu dan satu dari bapa (X^BX^B dan X^BX^b). Anak perempuan yang mempunyai genotip X^BX^b adalah seorang yang berpenglihatan normal kerana alel X^b dihalang oleh alel X^B.	1 1 1 1 4 1 1 1 1 1 **Max: 10 markah**

Question 8:

Item No	Marking Criteria	Marks
8. (a)	- control the production and secretion of hormones by other endocrine glands - secrete many hormone directly from endocrine gland into bloodstream rather than through a duct	1 1
(b)	- the eyes detect the monster (external stimulus) - transmits the nerve impulse to central nervous system (brain) through afferent neurone - The brain receives, interprets and transmits nerve impulse - to endocrine gland (effectors) through efferent neurone - endocrine gland (adrenal gland) secrete adrenaline hormone - Causing the increase heart beat and rate metabolism - the contraction and relation of leg muscle - causing the leg to move very fast	1 1 1 1 1 1 1 1 **Total = 10 marks**
8. (c)	(i)- Synapse is a narrow gap between an axon terminal and a dendrite of another adjacent neuron. - A chemical (neurotransmitter) is used by neuron to transmit an impulse across a synapse - The transmission of information across a synapse involves the conversion of electrical signal into chemical signal in the form of neurotransmitter. - Neurotransmitter is produced in vesicles in a swollen part of the axon terminal called synaptic knob. - Synaptic knob contains abundant mitochondrion to generate energy for the transmission. - When an impulse arrived at the synaptic knob, the vesicles release the neurotransmitters into the synapse. - The neurotransmitters molecules diffuse across the synapse to the dendrite of another neurons. The dendrite of another neurons is stimulated to trigger a new impulse which travel down a long neuron.	1 1 1 1 1 1 1 1 **Max=6 marks**

(c)(ii)	Alzheimer's Caused by -the shrinkage of brain tissues and lack of neurotransmitter. Usually affects the elderly Effect: -Loss of intelligent -Loss of memory -Poor concentration Parkinson's Caused by -the reduced level of neurotransmitter in the brain caused tremors and weakness of the muscles -The hardening of the cerebral arteries Effect: -The muscle cannot function smoothly and become stiff and jerky in their action	1 1 **(any one)** 1 1 **Max=1 mark** 1

Question 9:

Item No	Marking Criteria	Marks
9(a)	Able to define the biodiversity and state two reason of its important. Biodiversity is; • Biodiversity is the diverse species of plants and animals • interacting with one another on earth. It important because; 1. Provides various biological products to humans. 2. To maintain the balance in nature. 3. Enable all organisms to survive as they are interdependent. 4. Rich heritage of flora and fauna / attract tourists Any two	 1 1 1 1 1 1 **(Max 4)**
(b)	Able to explain the prey-predator interaction Prey-predator interaction F1: When the population of a predator (wolf) is high, the population of its prey (rabbit) decreases E1: because the prey is eaten by the predator F2: When the population of the prey falls, there is insufficient food for the predator E2: results in a decline of the predator population F3: When the population of predator is low, the prey recovers and its population increases E3: result in an increase in the population of the predator (have enough food)	 1 1 1 1 1 1 1 **(Max 6)**
(c)	(i) Dapat menamakan dan memberi penerangan kejadian hujan asid. • Hujan asid • pembakaran bahan api fosil membebaskan gas sulfur dan nitrogen oksida / dioksida • diudara gas ini bertindak balas dengan wap air di atmosfera // larut dalam air hujan • membentuk asid sulfurik / nitrik / karbonik dan turun sebagai hujan asid	 1 1 1 1 **(Max 4)**
	(ii) Dapat memberi huraian mengenai kesan hujan asid ke atas hidupan dan ekosistem • mengubah pH tanah menjadi berasid • menjadi tidak sesuai untuk tanaman • mengubah pH air tasik / sungai • menyebabkan kematian haiwan dan tumbuhan akuatik • melarut resapkan nutrien penting seperti kalsium, magnesium dan kalium dari tanah • menganggu pertumbuhan tumbuhan dan akhirnya mati • membunuh organisma pengurai dalam tanah • habitat haiwan dan tumbuahan musnah dan keseimbangan ekosistem terganggu	 1 1 1 1 1 1 1 **(Max 6)** **Total 10**

MARKING SCHEME : PAPER THREE – TRIAL BIOLOGY 2012

Question 1 : 1(a)

<table>
<tr><th>Score</th><th>Explanation</th></tr>
<tr><td>3</td><td>Able to record all readings of volume of urine produced

<table>
<tr><th>Student</th><th>Volume of urine in the first experiment/ml</th><th>Volume of urine in the second experiment/ml</th></tr>
<tr><td>A</td><td>60</td><td>50</td></tr>
<tr><td>B</td><td>150</td><td>150</td></tr>
<tr><td>C</td><td>260</td><td>250</td></tr>
<tr><td>D</td><td>360</td><td>380</td></tr>
</table></td></tr>
<tr><td>2</td><td>Able to record any 4-5 volume</td></tr>
<tr><td>1</td><td>Able to record any 2-3 volume</td></tr>
<tr><td>0</td><td>No response or wrong response</td></tr>
</table>

1(b)(i)

<table>
<tr><th>Score</th><th>Explanation</th></tr>
<tr><td>3</td><td>Able to state two correct observations based on following criteria.
C1 – volume of water intake
C2 – volume of urine produced

Sample Answer:(either 2):
1. When the volume of water intake is 100 ml, the volume of urine produced in first experiment is 60 ml and second experiment is 50 ml.
2. When the volume of water intake is 400 ml, the volume of urine produced in first experiment is 360 ml and second experiment is 380 ml.</td></tr>
<tr><td>2</td><td>Able to state one correct observation and one inaccurate response.</td></tr>
<tr><td>1</td><td>Able to state one correct observation or two inaccurate response or idea.</td></tr>
<tr><td>0</td><td>No response or wrong response (response like hypothesis)</td></tr>
</table>

1(b) (ii)

<table>
<tr><th>Score</th><th>Explanation</th></tr>
<tr><td>3</td><td>Able to state two reasonable inferences for the observation.

Sample answer:
1. When the volume of water intake is less, more water is reabsorbed, less urine is produced
2. When the volume of water intake is more, less water is reabsorbed, more urine is produced</td></tr>
<tr><td>2</td><td>Able to state one correct inference and one inaccurate inference.</td></tr>
<tr><td>1</td><td>Able to state one correct inference or two inaccurate inference or idea.</td></tr>
<tr><td>0</td><td>No response or wrong response (inference like hypothesis)</td></tr>
</table>

1(c)

Score	Explanation
3	Able to state **all the variables and the method** to handle variable correctly *(√) for each variable and method* Manipulated Variable: Volume of water intake/ml (√) Method to handle: drinks different volume of water which is 100 ml,200 ml,300 ml and 400 ml (√) Responding Variable: Volume of urine produced (√) Method to handle: Measure and **record** the volume of urine produced after half an hour by using measuring cylinder.(√) Controlled variable : type of water intake/ duration to collect urine (√) Method to handle: . drink **same** type of water/ fix the time to half an hour to collect urine (√) Able to get 6 √ (with the correct key words)
2	Able to get 4 – 5 √
1	Able to get 2 – 3 √
0	No response or wrong response

1(d)

Score	Explanation
3	Able to **state the hypothesis correctly** based on the following criteria: V1 – State the volume of water intake V2 – State the volume of urine produced R - State the relationship between V1 and V2. The more the volume of water intake, the more the volume of urine produced.
2	Able to state the hypothesis but less accurate.
1	Able to state the idea of the hypothesis
0	No response or wrong response

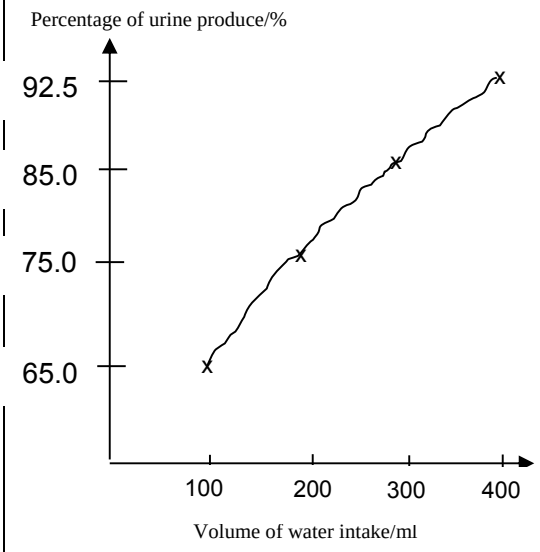
1(e)(i)

Score	Explanation
3	Able to **construct a table and record** the result of the experiment with the following criteria: -student (√) – volume of water intake(ml) (√) -volume of urine produce(ml) (√) – average of volume of urine produced (ml) (√) - percentage of urine produced (%) (√) **If without unit (x)**

Students	Volume of water intake/ml	Volume of urine produced/ml		Average of volume of urine produced/ml	Percentage of volume of urine produced / %
		First experiment	Second experiment		
A	100	60	50	65	65.0
B	200	150	150	150	75.0
C	300	260	250	255	85.0
D	400	360	380	370	92.5

2	Able to construct a table and record any two criteria
1	Able to construct a table and record any one criteria
0	No response or wrong response

1(e)(ii)

Score	Explanation
3	Able to draw a line graph of percentage of urine produced against the volume of water intake. Axes (A) – both axis are labeled with units, uniform scales, independent variable on horizontal axis. (√) Point (P) – All points are correctly plotted. (√) 
	Graph with any two criteria.
1	Graph with any one criteria.
0	No response or wrong response.

1(f)

Score	Explanation
3	Able to **explain the relationship between the volume of water intake** and **the volume of urine produced** correctly. When the volume of water intake is more, the volume of urine produce also more because less water is reabsorbed
2	Able to explain briefly the relationship between the volume of water intake and volume of urine produced
1	Able to explain the idea the relationship between the volume of water intake and volume of urine produced
0	No response or wrong response

1(g)

Score	Explanation
3	Able to state the definition of urine correctly, based on the following criteria. C1 – waste product (in the form of liquid) C2 – excreted by human C3 – influence by volume of water intake

	Urine is a waste product in the form of liquid excreted by human and influent by the volume of water intake
2	Able to state the definition of urine based one of the two criteria.
1	Able to state the idea of urine
0	No response or wrong response

1(h)

Score	Explanation
3	Able to **predict** correctly and explain the prediction based on the following item: C1 – the volume of urine produced C2 – blood osmotic pressure C3 - reabsorption of water The volume of urine produced is less than 78 ml because after drinking 5% sodium chloride solution, the blood osmotic pressure increases , therefore more water is reabsorbed thus the volume of urine produced is less.
2	Able to predict based on any two criteria.
1	Able to predict based on any one criteria.
0	No response or wrong response

1(i)

Score	Explanation
3	Able to classify the apparatus and material used in the experiment *Apparatus* / *Materials* Measuring cylinder / Drinking water Drinking bottle / Urine Stopwatch Able to classify all the apparatus and material correctly.
2	Able to classify two apparatus and two material correctly.
1	Able to classify two apparatus and one material correctly.
0	No response or wrong response

Question 2 :

No.	Mark Scheme	score
2(i)	Able to state a **problem statement** relating the manipulated variables with the responding variables correctly P1: manipulated variables : effect of nitrogen, phosphorus and potassium P2: responding variables : on leaf colour / root growth / height of plant H:relationship in question form (?) Sample answers 1. What are the effect of nitrogen, phosphorus and potassium on the leaf colour / root growth / height of plant?	3
	Able to state a problem statement inaccurately Sample answers 1. What are the effect of nitrogen, phosphorus and potassium on the leaf colour / root growth / height of plant. 2. The height of the plant is affected by the present of nitrogen, phosphorus and potassium	2
	Able to state a problem statement at idea level Sample answers 1. Nitrogen, phosphorus and potassium affect a plant.	1
	No response or incorrect response	0
2(ii)	Able to state **hypothesis** relating the manipulated variables to the responding variables correctly P1: manipulated variables : nitrogen deficiency/ phosphorus deficiency / potassium deficiency P2: responding variables: leaves of corn become yellow /retarded the growth of roots / retarded the height of the plant R:relationship : will cause / will make Sample answers 1. The nitrogen deficiency will cause the leaves of corn become yellow. 2. The phosphorus deficiency will cause retardation of the roots growth. 3. The potassium deficiency will retarded the height of the plant. (note: wrong hypothesis is accepted)	3
	Able to state a hypothesis inaccurately Sample answer 1.The nitrogen deficiency will cause the plant retarded.	2
	Able to state a hypothesis at idea level Sample answers 1. Nutrient affect/influence the growth of a plant.	1
	No response or incorrect response	0

2(iii)	**Able to state all three variables correctly** Sample answers 1. Manipulated variable: nutrient deficiency 2. Responding variable: colour of leaves / root growth / height of plant 3. Constant variable: light intensity / amount of solution	3
	Able to state any two variables correctly	2
	Able to state any one variables correctly	1
	No response or incorrect response	0
2(iv)	Able to list all the important apparatus and materials correctly Sample answers Apparatus : culture bottle// boiling tube// conical flask , glass tubing, cotton , ruler , string and measuring cyclinder. Materials : knop's solution, knop's solution without nitrogen , Knop's solution without phosphorus , Knop's solution without potassium and corn plant,black paper. 6A + 6M	3
	Able to list at least 5 apparatus and 5 materials correctly A=Without a meter ruler and Knop's solution 5A+ 5M	2
	Able to list at least 4 apparatus and 4 materials correctly Without a meter ruler, measuring cyclinder , Knop's solution and Knop's solution without phosphorus. 4A+4M	1
	No response or incorrect response	0
2(v) K1 K1+k2+k5 K4 K5 K1 K1 K3 K1+k2	Able to describe the steps of the experiment procedure or method correctly. Sample answers 1. Four culture bottles are prepared and labeled A, B,C and D. 2. Each bottles are filled with 200 ml of solution, a corn plant supported by cotton wool and inserted a glass tube to supply air to the solution. 3. The solution that put into the bottles are ; A - 200 ml of complete Knop's solution as control experiment B - 200 ml of Knop's solution without nitrogen C - 200 ml of Knop's solution without phosphorus D – 200 ml of Knop's solution without potassium 4. All the boiling tube were covered with black paper to prevent algae growth. 5. All four bottles are put in well lighted place, but the root part are covered from light. 6.The water level of each bottle is checked from time to time. 7.The height of the plants are measured and recorded by using a ruler. 8. The root growth and leaves colour are observed every 3 days and recorded. **Note**	

<table>
<tr><td></td><td>K1: steps 1,2,3,4,5,6,8,9,13(preparing of material and apparatus)
K2: step 3,8 (operating fixed variable)
K3: step 12,15 (operating responding variable)
K4: step 11,13 (operating manipulated variable)
K5: step 3,7,10 (precaution)

All the ‘K’</td><td>3</td></tr>
<tr><td></td><td>Any 3-4 K</td><td>2</td></tr>
<tr><td></td><td>Any 2 K</td><td>1</td></tr>
<tr><td></td><td>No response or incorrect response</td><td>0</td></tr>
<tr><td>2(vi)</td><td>Able to present all the data with units correctly
<u>Sample answers</u>

<table><tr><td>Boiling tube</td><td>Nutrient deficiency</td><td>Effect on plant</td></tr><tr><td>A</td><td>None</td><td></td></tr><tr><td>B</td><td>Nitrogen</td><td></td></tr><tr><td>C</td><td>Phosphorus</td><td></td></tr><tr><td>D</td><td>Potassium</td><td></td></tr></table></td><td>2</td></tr>
<tr><td></td><td>Able to present a table with at least two titles correctly</td><td>1</td></tr>
<tr><td></td><td>No response or incorrect response</td><td>0</td></tr>
</table>

END OF MARKING SCHEME