Nama ..... Tingkatan .....

Sekolah .....

MODUL PINTAS
TINGKATAN 5

4551/1

BIOLOGY
Kertas 1

$1\frac{1}{4}$ jam

Satu jam lima belas minit

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. *Kertas peperiksaan 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 peperiksaan ini.*

Kertas peperiksaan ini mengandungi 32 halaman bercetak.

1 Which of the following organelles position is closes to the nucleus?
Antara organel berikut, yang manakah kedudukannya paling dekat dengan nukleus?

A Chloroplast
Kloroplas

B Golgi apparatus
Jasad Golgi

C Mitochondrion
Mitokondrion

D Rough endoplasmic reticulum
Jalinan endoplasma kasar

2 Which of the following organelles in plant cell is tough and rigid?
Antara organel di dalam sel tumbuhan berikut, yang manakah bersifat kuat dan tegar?

A Vocuole
Vakuol

B Ribosome
Ribosom

C Chloroplast
Kloroplas

D Cell wall
Dinding sel

3 Diagram 1 shows a flower and leaves of a hibiscus plant.
Rajah 1 menunjukkan bunga dan daun bagi tumbuhan bunga raya.

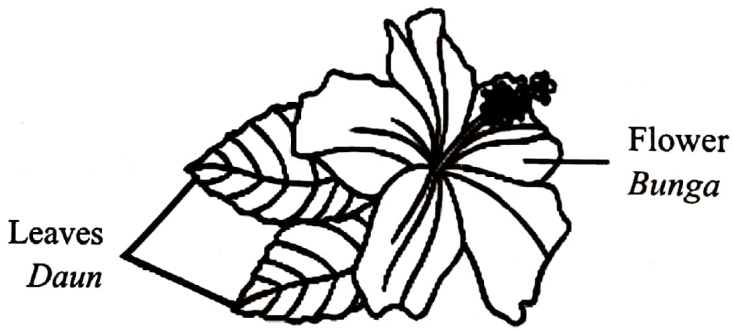


Diagram 1
Rajah 1

What are the terms that describe the level of organisation of flowers and of leaves of a plant?
Apakah istilah yang menghuraikan aras organisasi bunga dan daun tumbuhan?

	Flower ***Bunga***	**Leaf** ***Daun***
A	Tissue *Tisu*	Tissue *Tisu*
B	Organ *Organ*	Tissue *Tisu*
C	Organ *Organ*	Organ *Organ*
D	Tissue *Tisu*	Organ *Organ*

4 Choose the statement that is false about plant and animal cells.
Pilih pernyataan salah tentang sel tumbuhan dan haiwan.

A Both have a nucleus
Kedua-duanya mempunyai satu nukleus

B Both have a cell wall
Kedua-duanya mempunyai satu dinding sel

C Both contain protoplasm
Kedua-duanya mengandungi protoplasma

D Both are basically microscopic
Kedua-duanya adalah mikroskopik pada asasnya

5 What is the function of cholesterol molecules in the plasma membrane?
Apakah fungsi molekul kolesterol dalam membran plasma?

A To stabilise the fluidity of the plasma membrane
Untuk menstabilkan kebendaliran membran plasma

B To help the cells to recognise each other
Untuk membantu sel mengecam satu sama lain

C To assist and control the movements of water-soluble ions
Untuk membantu dan mengawal pergerakan ion larut air

D Acts as membrane carriers to move substances across the plasma membrane by active transport
Bertindak sebagai pembawa membran untuk menggerakkan bahan merentasi membran plasma dengan pengangkutan aktif

6 Which of the processes are involved in the movement of water and mineral ions into root hair of a plant?
Proses-proses manakah yang terlibat dalam pergerakan air dan ion mineral ke dalam rambut akar tumbuhan?

	Mineral ions ***Ion mineral***	**Water** ***Air***
A	Active transport *Pengangkutan aktif*	Osmosis *Osmosis*
B	Facilitated diffusion *Resapan berbantu*	Active transport *Pengangkutan aktif*
C	Active transport *Pengangkutan aktif*	Simple diffusion *Resapan ringkas*
D	Osmosis *Osmosis*	Facilitated diffusion *Resapan berbantu*

[Lihat halaman sebelah

7 Diagram 2 shows an experiment to study osmosis process.
Rajah 2 menunjukkan satu eksperimen untuk mengkaji proses osmosis.

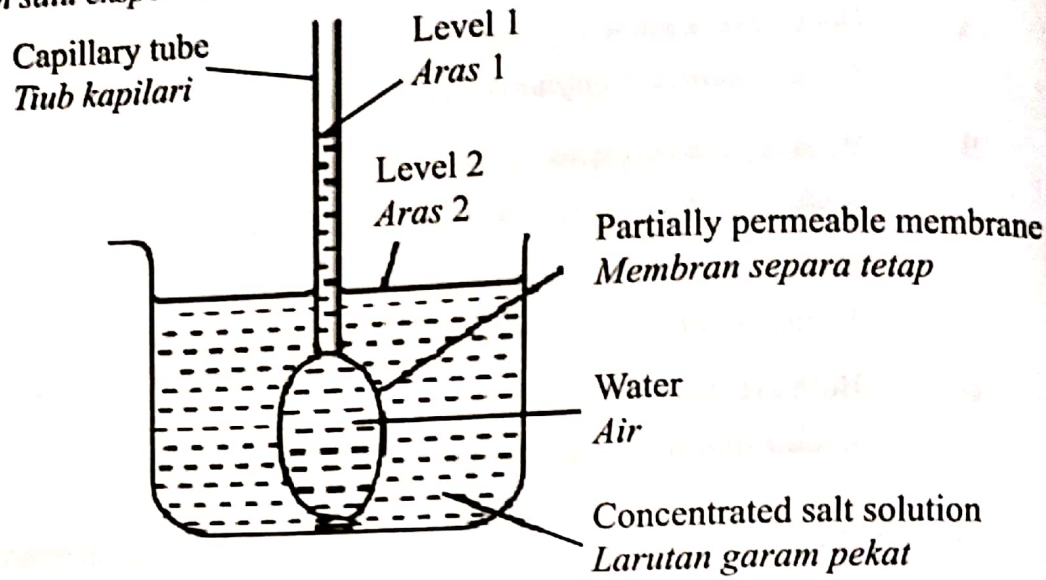


Diagram 2
Rajah 2

Which of the following shows the results of the experiment after three hours?
Antara berikut, yang manakah menunjukkan keputusan eksperimen selepas tiga jam?

	Level 1 *Aras 1*	Level 2 *Aras 2*
A	Rise *Naik*	Fall *Turun*
B	Rise *Naik*	Rise *Naik*
C	Fall *Turun*	Rise *Naik*
D	Fall *Turun*	Fall *Turun*

8 Which of the following represent the hydrolysis of protein?
Antara berikut, yang manakah mewakili hidrolisis protein?

A Polypeptides + Water → Dipeptides
Polipeptida *Air* *Dipeptida*

B Dipeptides + Water → Polypeptide
Dipeptida *Air* *Polipeptida*

C Polypeptides + Water → Dipeptides
Polipeptida *Air* *Dipeptida*

D Dipeptides + Water → Polypeptide
Dipeptida *Air* *Polipeptida*

9 Diagram 3 shows organelles P, Q and R that are involved in the synthesis and secretion of an extracellular enzyme. The process begins at DNA.

Rajah 3 *menunjukkan organel* P, Q *dan* R *yang terlibat dalam sintesis dan rembesan enzim luar sel. Proses ini bermula di* DNA.

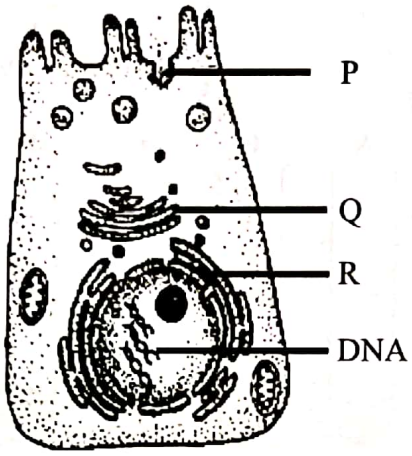


Diagram 3
Rajah 3

Which sequence is correct in the production of the extracellular enzyme?
Urutan manakah yang betul dalam penghasilan enzim luar sel?

A P → Q → R **B** R → Q → P

C Q → P → R **D** R → P → Q

10 Diagram 4 shows an experiment conducted to study the effect of salivary amylase on starch.

Rajah 4 *menunjukkan satu eksperimen yang dijalankan untuk mengkaji kesan amilase liur ke atas kanji.*

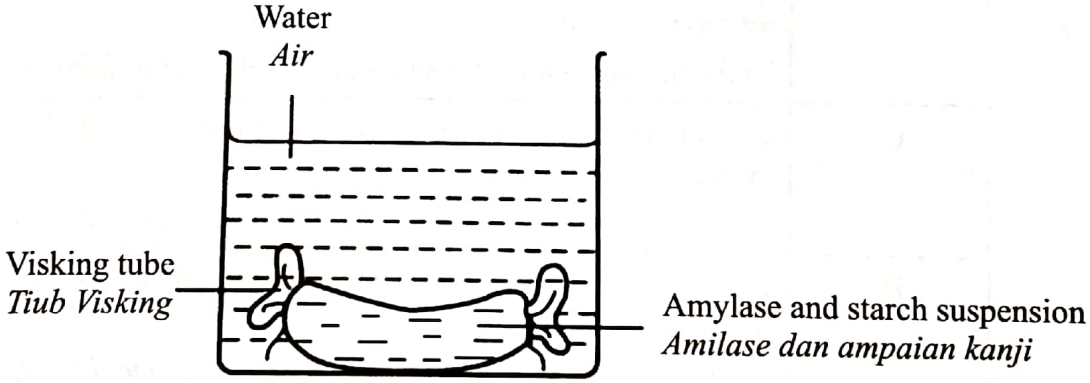


Diagram 4
Rajah 4

At what temperature, T, a type of reducing sugar, is detected most quickly after 1 minute?
Pada suhu apakah, T, *sejenis gula penurun, paling cepat dikesan selepas* 1 *minit*?

A 10 °C **B** 25 °C

C 35 °C **D** 50 °C

11 Diagram 5 shows an experiment carried out by a student to study an enzymatic action on a carbohydrate food sample.

Rajah 5 menunjukkan satu eksperimen yang dijalankan oleh seorang murid untuk mengkaji tindakan enzim ke atas satu sampel makanan berkarbohidrat.

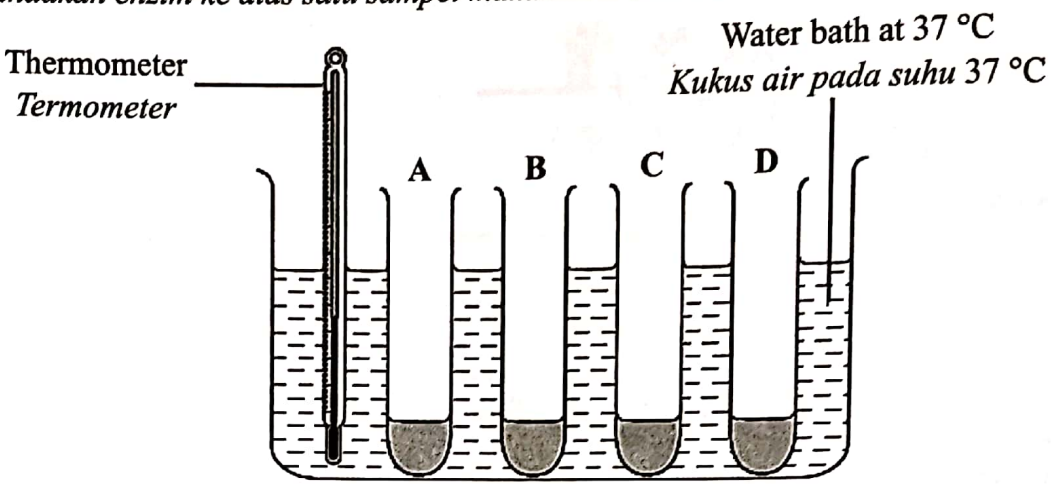


Diagram 5
Rajah 5

The observations are shown in Table 1.
Pemerhatian ditunjukkan dalam Jadual 1.

Test tube *Tabung uji*	**Contents** *Kandungan*
A	2 ml of starch suspension + 5 drops of 0·1 mol dm^{-3} hydrochloric acid + 1 ml of 1 % amylase solution 2 ml *ampaian kanji* + 5 *titis* 0·1 mol dm^{-3} *asid hidroklorik* + 1 ml *larutan amilase* 1 %
B	2 ml of starch suspension + 5 drops of distilled water + 1 ml of 1 % pepsin solution 2 ml *ampaian kanji* + 5 *titis air suling* + 1 ml *larutan pepsin* 1 %
C	2 ml of starch suspension + 5 drops of distilled water + 1 ml of 1 % amylase solution 2 ml *ampaian kanji* + 5 *titis air suling* + 1 ml *larutan amilase* 1 %
D	2 ml of starch suspension + 5 drops of sodium hydroxide solution + 1 ml of 1% amylase solution 2 ml *ampaian kanji* + 5 *titis larutan natrium hidroksida* + 1 ml *larutan amilase* 1 %

Table 1
Jadual 1

Which contents of the labelled test tubes **A**, **B**, **C** or **D**, needs the shortest time for enzyme activities?

Antara kandungan tabung uji yang berlabel **A**, **B**, **C** *dan* **D**, *yang manakah memerlukan masa terpendek untuk aktiviti enzim*?

12 G1, S, G2, and M in the Diagram 6 shows the phases of a cell cycle.
G1, S, G2 *dan* M *dalam Rajah* 6 *menunjukkan fasa-fasa dalam kitar sel.*

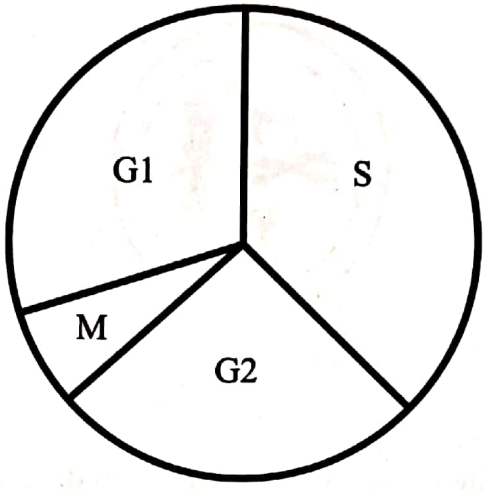


Diagram 6
Rajah 6

Which of the following is true about G2 phase?
Antara berikut, yang manakah benar mengenai fasa G2?

A Mitosis and cytokinesis
Mitosis dan sitokinesis

B Accumulation of energy
Pengumpulan tenaga

C Synthesis of organelle
Sintesis organel

D Synthesis of DNA
Sintesis DNA

13 The number of diploid chromosomal for a Brahman parent cow is 128.
If one of the homologous chromosome pairs is not separated during meiosis I, what is the number of chromosomes that may be found in the gametes?
Bilangan kromosom diploid bagi seekor lembu induk Brahman ialah 128.
Jika satu daripada pasangan kromosom homolog tidak terpisah semasa meiosis I, *berapakah bilangan kromosom yang mungkin didapati pada gamet*?

A 65

B 64

C 66

D 128

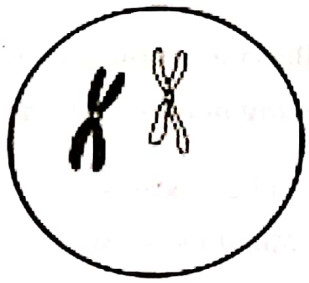
14 Diagram 7 shows a cell division in the reproductive organ of an animal.
Rajah 7 menunjukkan pembahagian sel dalam organ pembiakan seekor haiwan.

Diagram 7
Rajah 7

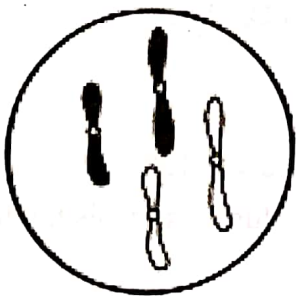
Which diagram represents the gamete cell after the cell division is completed?
Rajah manakah mewakili sel gamet setelah pembahagian sel itu lengkap?

A

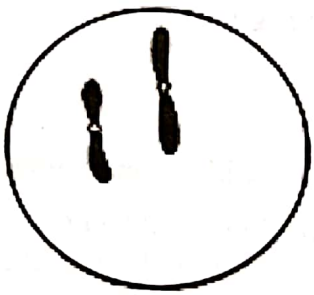
B



C



D



15 Which of the following carry out chemosynthetic nutrition?
Antara berikut, yang manakah menjalankan pemakanan kemosintetik?

A Rafflesia
Rafflesia

B Tapeworm
Cacing pita

C Pitcher plant
Pokok periuk kera

D Sulphur-oxidising bacteria
Bakteria pengoksida sulfur

16 Diagram 8 shows the human digestive system.
Rajah 8 menunjukkan sistem pencernaan manusia.

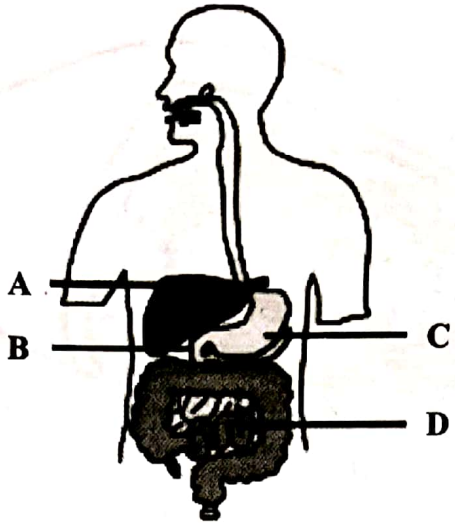


Diagram 8
Rajah 8

Which part labelled **A**, **B**, **C** or **D** involved in deamination process?
Antara bahagian berlabel **A**, **B**, **C** *dan* **D**, *yang manakah terlibat dalam proses pendeaminan*?

17 Diagram 9 shows part of the human digestive system and endocrine system.
Rajah 9 menunjukkan sebahagian daripada sistem pencernaan dan sistem endokrin manusia.

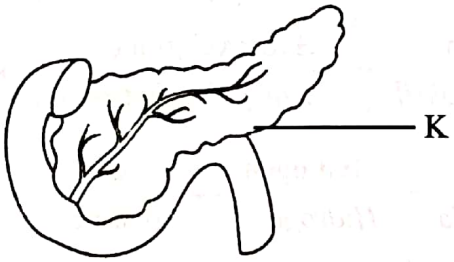


Diagram 9
Rajah 9

What will happen to the digestive process if K fails to function?
Apakah yang akan berlaku terhadap proses pencernaan sekiranya K *gagal berfungsi*?

A A lot of glucose is formed
Banyak glukosa terbentuk

B Hyperglycemia does not occur
Hiperglisemia tidak berlaku

C The digestion of carbohydrate will be disrupted
Pencernaan karbohidrat akan terganggu

D There is no alkaline medium in the duodenum
Tidak ada medium alkali di duodenum

18 Diagram 10 shows a structure of chloroplast.
Rajah 10 *menunjukkan struktur kloroplas.*

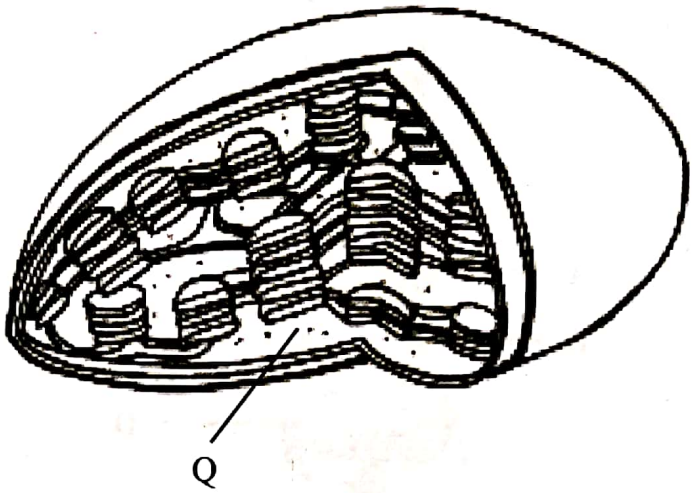


Diagram 10
Rajah 10

What is the reaction that occurs in Q?
Apakah tindak balas yang berlaku di Q?

A Hydrogen ion / *Ion hidrogen* + Electron / *Elektron* → Hydrogen atom / *Atom hidrogen*

B Hydroxyl group / *Kumpulan hidroksil* + Hydroxyl group / *Kumpulan hidroksil* → Oxygen / *Oksigen* + Water / *Air*

C Carbon dioxide / *Karbon dioksida* + Hydrogen / *Hidrogen* → Glucose / *Glukosa* + Water / *Air*

D Glucose / *Glukosa* + Oxygen / *Oksigen* → Carbon dioxide / *Karbon dioksida* + Water / *Air* + Energy / *Tenaga*

19 Diagram 11 shows the apparatus set-up to determine the energy value of a groundnut.
Rajah 11 *menunjukkan susunan radas untuk menentukan nilai tenaga sebiji kacang tanah.*

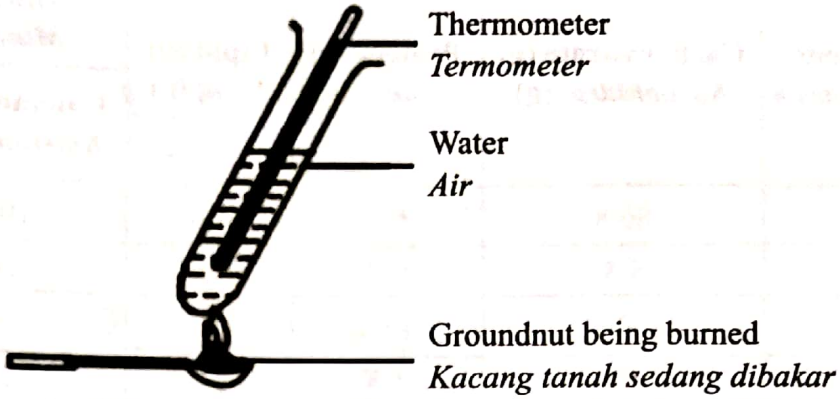


Diagram 11
Rajah 11

The observations are shown in Table 2.
Pemerhatian ditunjukkan dalam Jadual 2.

Mass of groundnut *Jisim kacang tanah*	0·45 g
Volume of water in boiling tube *Isi padu air dalam tabung didih*	20 ml
Initial water temperature *Suhu awal air*	30 °C
Final water temperature *Suhu akhir air*	64 °C
Specific heat capacity *Muatan haba tentu*	4·2 J g^{-1}

Table 2
Jadual 2

Calculate the energy value of the groundnut.
Kira nilai tenaga kacang tanah tersebut.

A 3 213 J g^{-1}

B 5 600 J g^{-1}

C 6 347 J g^{-1}

D 11 947 J g^{-1}

20 Table 3 shows the nutrient content of energy for 100 g of certain food.
Jadual 3 *menunjukkan kandungan nutrien untuk tenaga bagi* 100 g *makanan tertentu.*

Foods *Makanan*	**Carbohydrate (g)** *Karbohidrat* (g)	**Protein (g)** *Protein* (g)	**Lipid (g)** *Lipid* (g)	**Mineral** *Mineral*	**Vitamin** *Vitamin*	
				Calcium (mg) *Kalsium* (mg)	**A (µg)**	**D (µg)**
U	86·8	6·2	1·0	100	0	45
V	8·5	0·8	0	41	8	0
W	0	17·4	0·7	16	0	65
X	4·8	3·3	3·8	120	44	1
Y	5·4	0·7	0	48	2 000	0
Z	4·2	12·3	10·9	4	155	50

Table 3
Jadual 3

Diagram 12 shows a disease.
Rajah 12 *menunjukkan sejenis penyakit.*

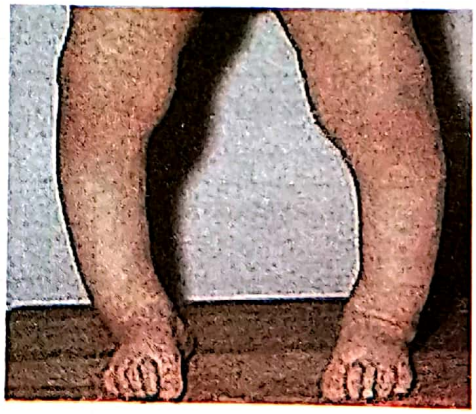


Diagram 12
Rajah 12

Which of the foods in Table 3 is most suitable for those who suffering from the disease as shown in Diagram 12?
Makanan manakah dalam Jadual 3 *paling sesuai untuk mereka yang menghidap penyakit seperti ditunjukkan dalam Rajah* 12?

A U, V and W
U, V *dan* W

B W, X and Z
W, X *dan* Z

C X, Y and Z
X, Y *dan* Z

D U, W and Z
U, W *dan* Z

21 Diagram 13 shows grass submerge in a waterlogged for a week.
Rajah 13 *menunjukkan rumput yang tenggelam di dalam air bertakung selama seminggu.*

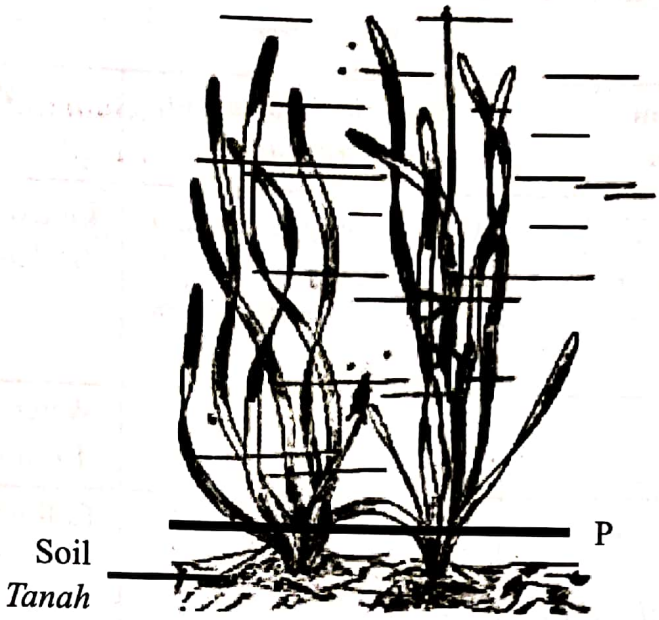


Diagram 13
Rajah 13

Which of the following is true about respiration at P?
Antara berikut, yang manakah adalah benar mengenai respirasi di P?

A Glucose / *Glukosa* → Lactic acid / *Asid laktik* + Energy / *Tenaga*

B Glucose / *Glukosa* → Ethanol / *Etanol* + Carbon dioxide / *Karbon dioksida* + Energy / *Tenaga*

C Glucose / *Glukosa* + Oxygen / *Oksigen* → Water / *Air* + Carbon dioxide / *Karbon dioksida* + Energy / *Tenaga*

D Glucose / *Glukosa* + Oxygen / *Oksigen* → Ethanol / *Etanol* + Carbon dioxide / *Karbon dioksida* + Energy / *Tenaga*

22 Which of the following structure increases the efficiency of the fish's gills as a respiratory organ?
Antara berikut, struktur yang manakah meningkatkan kecekapan insang ikan sebagai organ pernafasan?

A Gill arch / *Lengkung insang*

B Filament / *Filamen*

C Lamellae / *Lamela*

D Blood capillary / *Kapilari darah*

23 Which of the following information is true for both aerobic respiration and photosynthesis process?

Antara maklumat berikut, yang manakah adalah benar bagi kedua-dua proses respirasi aerob dan fotosintesis?

	Information ***Maklumat***	**Aerobic respiration** ***Respirasi aerob***	**Photosynthesis** ***Fotosintesis***
A	Reaction product *Hasil tindak balas*	Carbon dioxide, ethanol and energy *Karbon dioksida, etanol dan tenaga*	Glucose, oxygen and water *Glukosa, oksigen dan air*
B	Substrate *Substrat*	Glucose *Glukosa*	Water and carbon dioxide *Air dan karbon dioksida*
C	Cell that carries out the process *Sel yang menjalani proses*	All types of living cells *Semua jenis sel hidup*	Cell with chloroplasts *Sel dengan kloroplas*
D	Condition at which process takes place *Keadaan di mana proses berlaku*	In the absence of light *Tanpa kehadiran cahaya*	In the presence of light *Dengan kehadiran cahaya*

24 A former mining ground can form a primary forest.

Which of the following is the correct sequence in the formation of the primary forest?

Tanah bekas lombong boleh membentuk hutan primer.

Antara berikut, yang manakah urutan betul dalam pembentukan hutan primer tersebut?

A Successor, climax community, pioneer
Penyesar, komuniti klimaks, perintis

B Pioneer, climax community, successor
Perintis, komuniti klimaks, penyesar

C Successor, pioneer, climax community
Penyesar, perintis, komuniti klimaks

D Pioneer, successor, climax community
Perintis, penyesar, komuniti klimaks

25 A student carried out a study on the population of grass L in the school's field. He used the quadrat sampling technique in the study. The area of each quadrat is 1 m^2.

Seorang murid menjalankan kajian populasi sejenis rumput L *di padang sekolahnya. Dia menggunakan teknik persampelan kuadrat dalam kajian tersebut. Luas setiap kuadrat ialah* 1 m^2.

Table 4 shows the result of the study.

Jadual 4 *menunjukkan keputusan kajian itu.*

Quadrat *Kuadrat*	**Area covered by grass L (m^2)** *Luas litupan rumput* **L (m^2)**
1	0·15
2	0·52
3	0·66
4	0·24
5	0·37

Table 4

Jadual 4

The percentage coverage of grass L in the school's field is

Peratus litupan rumput L *di padang sekolah tersebut ialah*

A 38·8 %

B 3·88 %

C 28·7 %

D 2·87 %

26 Diagram 14 shows a process carried out by a farmer to make compost.

Rajah 14 *menunjukkan satu proses yang dilakukan oleh seorang petani untuk membuat kompos.*

Diagram 14

Rajah 14

Which organism is involved in this process?

Organisma manakah yang terlibat dalam proses ini?

A Algae
Alga

B Virus
Virus

C Bacteria
Bakteria

D Protozoa
Protozoa

27 Diagram 15 shows an ecosystem of a pond.
Rajah 15 *menunjukkan ekosistem bagi sebuah kolam.*

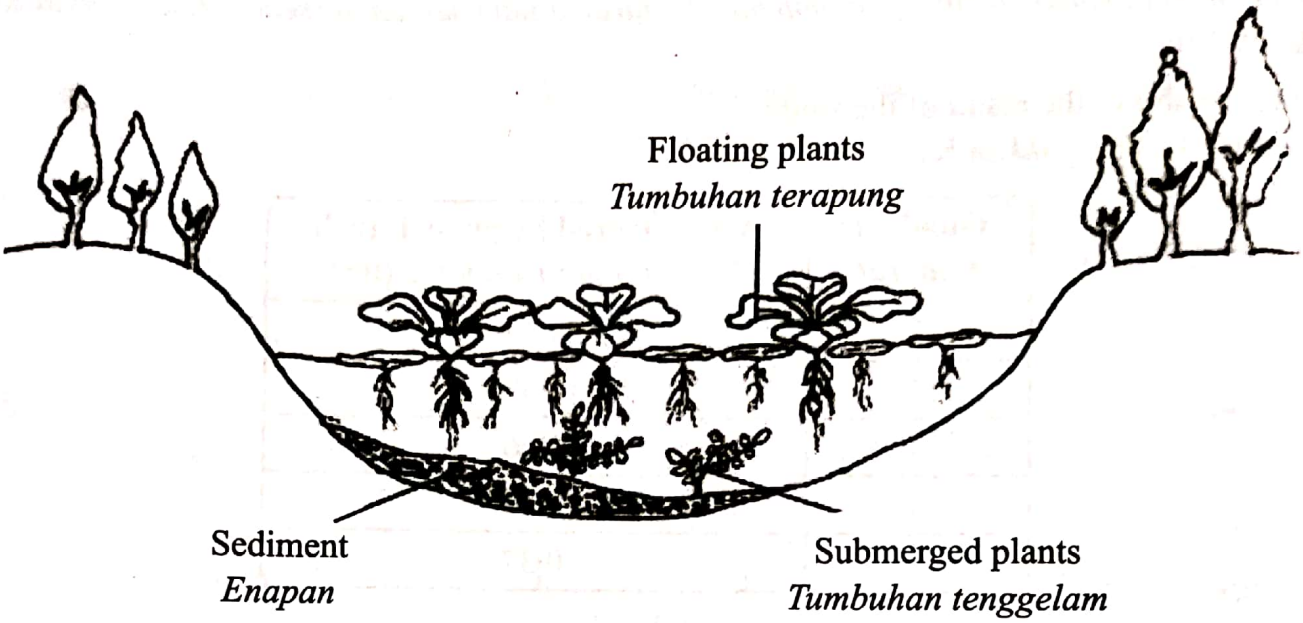


Diagram 15
Rajah 15

Which activity does not reduce sediment?
Aktiviti manakah tidak dapat mengurangkan enapan?

A Dig the pond
Menggali kolam tersebut

B Remove the floating plants
Mengalihkan tumbuhan terapung tersebut

C Remove the submerged plants
Mengalihkan tumbuhan tenggelam tersebut

D Spray the aquatic plant with herbicides
Menyembur tumbuhan akuatik itu dengan herbisid

28 The following steps are implemented to reduce environmental damage.
Langkah-langkah berikut dilaksanakan untuk mengurangkan kemusnahan terhadap alam sekitar.

I Sharing transport
Berkongsi kenderaan

II Replanting trees
Menanam semula pokok

III Reducing the usage of fossil fuel
Mengurangkan penggunaan bahan api fosil

IV Reducing the leftovers of industrial solid waste
Mengurangkan pembuangan sisa pepejal industri

Which steps can help to reduce the effects of global warming?
Langkah-langkah manakah yang dapat membantu mengurangkan kesan pemanasan global?

A I, II and III
I, II *dan* III

B I, II and IV
I, II *dan* IV

C II, III and IV
II, III *dan* IV

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

29 Which of the following descriptions is true about blood cells?
Antara keterangan berikut, yang manakah benar tentang sel-sel darah?

	Blood cell *Sel darah*	**Description** *Keterangan*
A	Erythrocyte *Eritrosit*	Biconcave in shape to enable the change of shape while passing through the blood capillary. *Berbentuk dwicengkung supaya boleh berubah bentuk semasa melalui kapilari darah.*
B	Platelet *Platelet*	Without nucleus and involved in the blood clotting mechanism. *Tanpa nukleus dan terlibat dalam mekanisme pembekuan darah.*
C	Monocytes *Monosit*	Produced in the bone marrow and produce antibodies to destroy pathogens. *Dihasilkan di sumsum tulang dan menghasilkan antibodi untuk memusnahkan patogen.*
D	Neutrophil *Neutrofil*	Without granules and destroy pathogens by phagocytosis. *Tanpa granul dan memusnahkan patogen secara fagositosis.*

30 Diagram 16 shows a type of blood circulatory system.
Rajah 16 menunjukkan sejenis sistem peredaran darah.

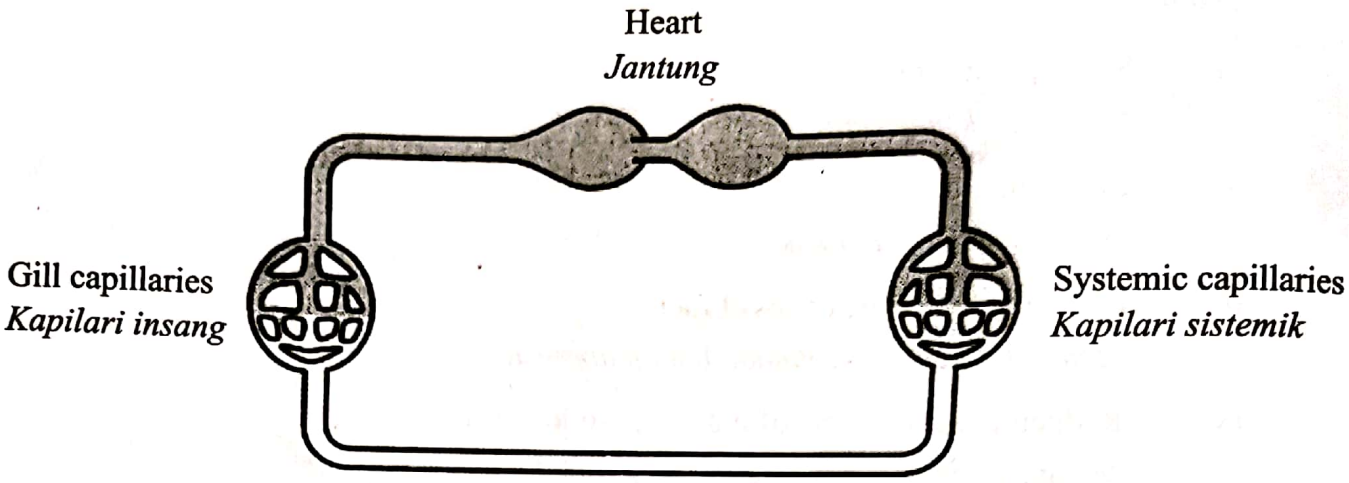


Diagram 16
Rajah 16

What is the type of circulatory system?
Apakah jenis peredaran darah tersebut?

A Open circulatory system
Sistem peredaran terbuka

B Double circulatory system
Sistem peredaran ganda dua

C Single, closed and complete circulatory system
Sistem peredaran tunggal, tertutup dan lengkap

D Single, closed and incomplete circulatory system
Sistem peredaran tunggal, tertutup dan tak lengkap

31 Diagram 17 shows an antibody mechanism that destroys antigen.
Rajah 17 menunjukkan satu mekanisme antibodi yang memusnahkan antigen.

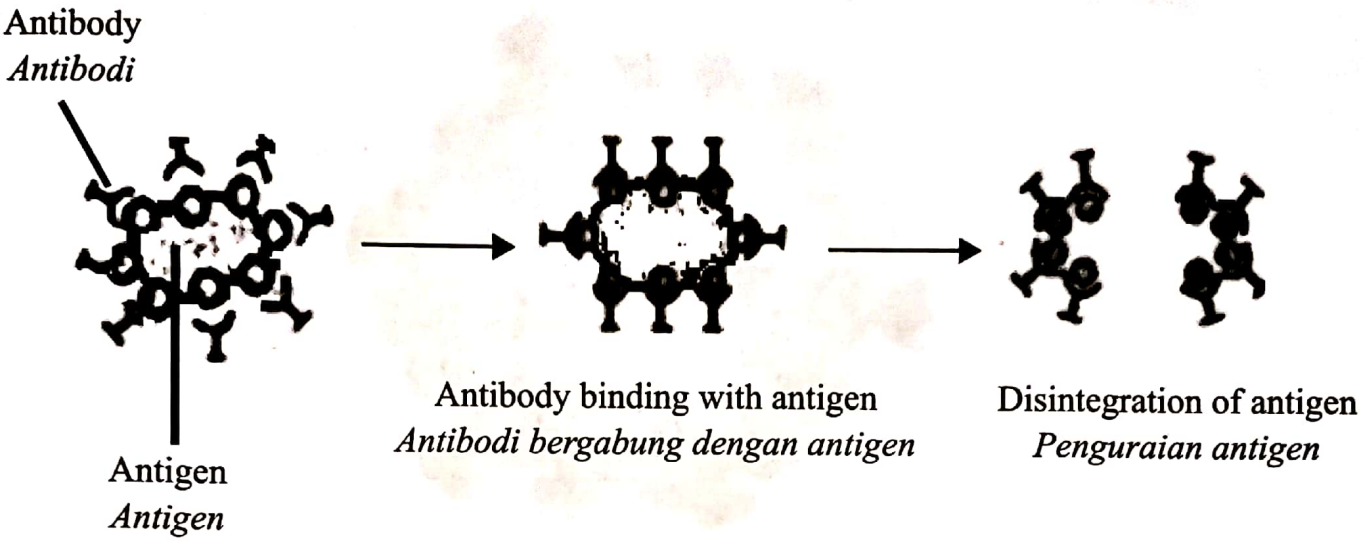


Diagram 17
Rajah 17

Which of the following is the mechanism?
Antara berikut, yang manakah adalah mekanisme tersebut?

A Lysis
Lisis

B Neutralisation
Peneutralan

C Precipitation
Pemendakan

D Agglutination
Penggumpalan

32 Diagram 18 shows a type of virus of HIV that can cause a fatal disease.
Rajah 18 *menunjukkan sejenis virus* HIV *yang boleh menyebabkan penyakit maut.*

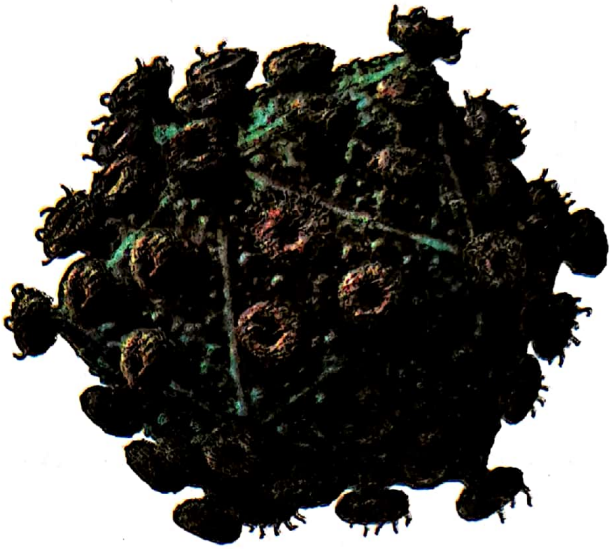


Diagram 18
Rajah 18

Which of the following is the major effect of the virus?
Antara berikut, yang manakah merupakan kesan utama virus tersebut?

A Lead to cell destruction
Mengakibatkan kemusnahan sel

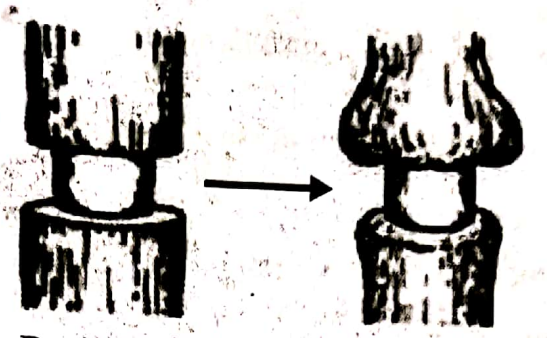
B Lead to cell division
Mengakibatkan pembahagian sel

C Disrupts the blood circulatory system
Mengganggu sistem peredaran darah

D Weaken the body's immune system
Melemahkan sistem keimunan badan

33 Diagram 19 shows the part of a stem of a tree where the ring of bark has been removed. The tree is watered daily.

Rajah 19 menunjukkan bahagian batang pokok yang gelang kulitnya telah dibuang. Pokok tersebut disiram setiap hari.



Beginning
Permulaan

After 1 month
Selepas 1 bulan

Diagram 19
Rajah 19

Which statement explains the observation?
Pernyataan manakah menerangkan pemerhatian itu?

A Fungus infection at the ring part of the bark
Serangan kulat pada bahagian kulit yang digelang

B Water diffuse out from the ring part of the bark
Air meresap keluar dari bahagian kulit yang digelang

C Glucose cannot be transport to the root
Glukosa tidak dapat diangkut ke akar

D Glucose and water cannot be transported to the leaves
Glukosa dan air tidak dapat diangkut ke daun

34 A doctor listened to Ahmad's heartbeat by using a stethoscope. He heard the sound of "lub-hiss, lub-hiss" sound instead of the normal heartbeat "lub-dup" sound.

Which of the following is most likely the cause of the "hiss" sound?

Seorang doktor mendengar degupan jantung Ahmad dengan menggunakan stetoskop. Dia mendengar bunyi "lub-hiss, lub-hiss" berbanding bunyi jantung yang normal iaitu bunyi "lub-dup".

Antara berikut, yang manakah adalah kemungkinan besar penyebab bunyi "hiss" tersebut?

A Clotted coronary artery
Koronari arteri yang tersumbat

B A defective semilunar valve
Kecacatan injap sabit

C High blood pressure
Tekanan darah tinggi

D A damaged pacemaker (SAN)
Perentak jantung (SAN) *rosak*

35 Diagram 20 shows a type of vertebrae.
Rajah 20 *menunjukkan sejenis vertebra.*

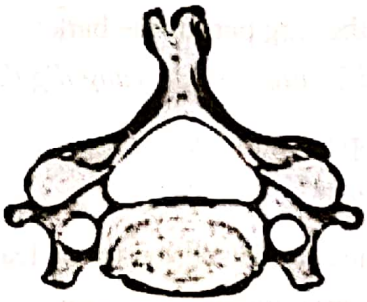


Diagram 20
Rajah 20

Which of the following is the vertebrae?
Antara berikut, yang manakah vertebra tersebut?

A Lumbar vertebrae
Vertebra lumbar

B Thoracic vertebrae
Vertebra toraks

C Atlas vertebrae
Vertebra atlas

D Cervical vertebrae
Vertebra serviks

36 Diagram 21 shows a fish.
Rajah 21 *menunjukkan seekor ikan.*

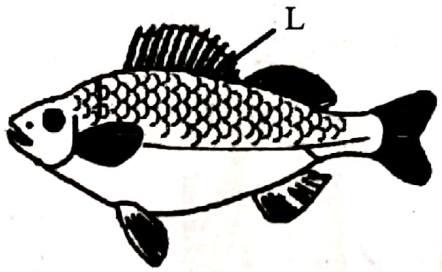


Diagram 21
Rajah 21

What is fin L?
Apakah sirip L?

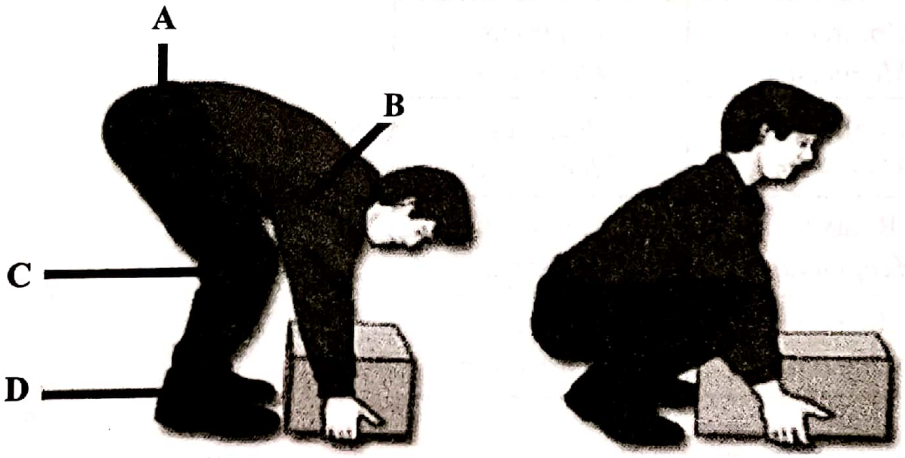
A Caudal fin
Sirip ekor

B Dorsal fin
Sirip dorsal

C Pelvic fin
Sirip pelvis

D Pectoral fin
Sirip pektoral

37 Diagram 22 shows the wrong way and the right way to lift a heavy object.
Rajah 22 *menunjukkan cara yang salah dan cara yang betul semasa mengangkat sesuatu objek yang berat.*



The wrong way
Cara yang salah

The right way
Cara yang betul

Diagram 22
Rajah 22

When lifting the wrong way, which part **A**, **B**, **C** or **D** is at the highest risk to suffer an injury?
Apabila mengangkat dengan cara yang salah, bahagian manakah **A**, **B**, **C** *dan* **D**, *berisiko tinggi untuk mengalami kecederaan*?

38 Diagram 23 shows the structure of a human forelimb.
Rajah 23 menunjukkan struktur lengan manusia.

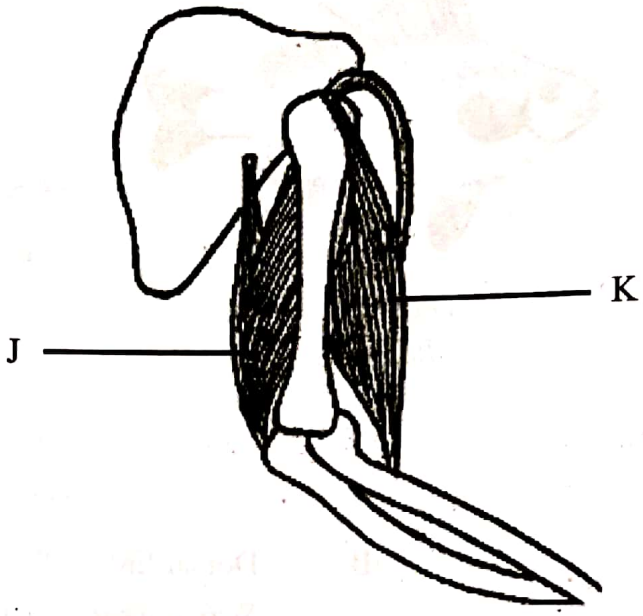


Diagram 23
Rajah 23

What happen to muscles J and K when the forelimb is straightened?
Apakah akan berlaku kepada otot J dan K apabila lengan diluruskan?

	J	K
A	Contracts *Mengecut*	Contracts *Mengecut*
B	Contracts *Mengecut*	Relaxes *Mengendur*
C	Relaxes *Mengendur*	Contracts *Mengecut*
D	Relaxes *Mengendur*	Relaxes *Mengendur*

39 The following information is about a coordination and response.
Maklumat berikut ialah berkenaan satu koordinasi dan gerak balas.

> A boy runs very fast after being chased by a fierce dog.
> *Seorang budak lelaki berlari dengan pantas setelah dikejar oleh seekor anjing yang garang.*

Which of the following occurs in the boy's body?
Antara berikut, yang manakah berlaku dalam badan budak lelaki tersebut?

A Metabolic rate decreases
Kadar metabolisme menurun

B Rate of digestion increases
Kadar pencernaan meningkat

C Concentration of blood glucose increases
Kepekatan glukosa darah meningkat

D Amount of glucagon secreted decreases
Jumlah glukagon yang dirembeskan menurun

40 A farmer wants to harvest the bananas from his plantation.
In order to make the bananas all ripe at the same time, which of the following methods can be use by the farmer?

Seorang petani mahu menuai pisang daripada ladangnya.
Bagi membolehkan kesemua pisang masak pada masa yang sama, kaedah yang manakah boleh digunakan oleh petani tersebut?

A Store the bananas in a warm room
Simpan pisang di dalam bilik bersuhu sederhana

B Cover the bananas with black plastic bags
Tutup pisang dengan beg plastik hitam

C Spray the bananas with ethylene
Sembur pisang dengan etilena

D Spray auxin solution on the ground
Sembur larutan auksin di atas tanah

41 Diagram 24 shows the female reproductive system.
Rajah 24 menunjukkan sistem pembiakan perempuan.

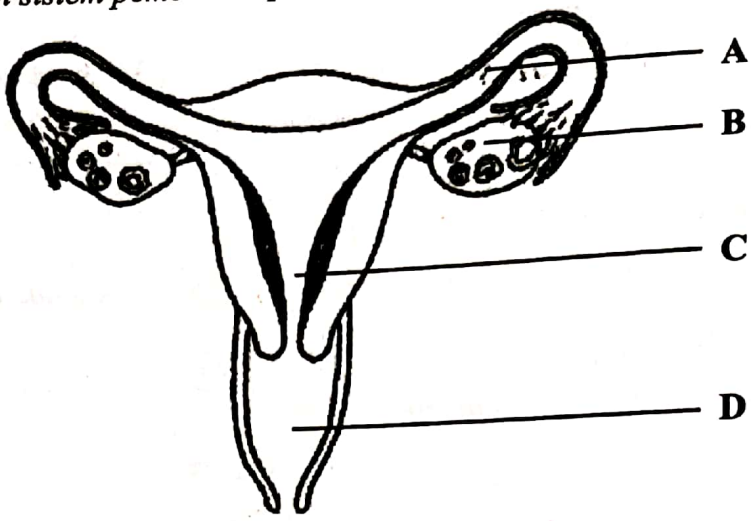


Diagram 24
Rajah 24

Which of the parts labelled, **A**, **B**, **C** or **D**, is the place where fertilization occurs?
Bahagian manakah yang berlabel **A**, **B**, **C** *dan* **D** *ialah tempat berlakunya persenyawaan*?

42 Diagram 25 shows a cross-section of a pistil of a plant.
Rajah 25 menunjukkan keratan rentas pistil bagi suatu tumbuhan.

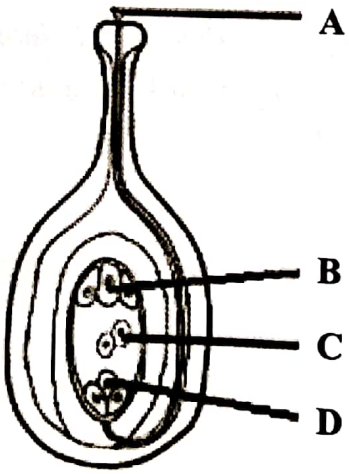


Diagram 25
Rajah 25

Which of the structures labelled, **A**, **B**, **C** or **D**, is a female gamete?
Antara struktur berlabel **A**, **B**, **C** *dan* **D** *yang manakah merupakan gamet betina*?

43 A medical check-up on a woman shows that there is a blockage in both of her Fallopian tubes. Which treatment may help the woman to get pregnant?

Satu pemeriksaan kesihatan ke atas seorang wanita menunjukkan kedua-dua tiub Fallopio tersumbat.

Rawatan manakah dapat membantu wanita itu untuk hamil?

A Intrauterine device
Alat Dalam Rahim

B In vitro fertilisation
Persenyawaan invitro

C Use of fertility pill
Penggunaan pil kesuburan

D Artificial insemination
Permanian beradas

44 Diagram 26 shows the secretion of two types of hormone during the female menstrual cycle.
Rajah 26 menunjukkan rembesan dua jenis hormon dalam kitar haid seorang perempuan.

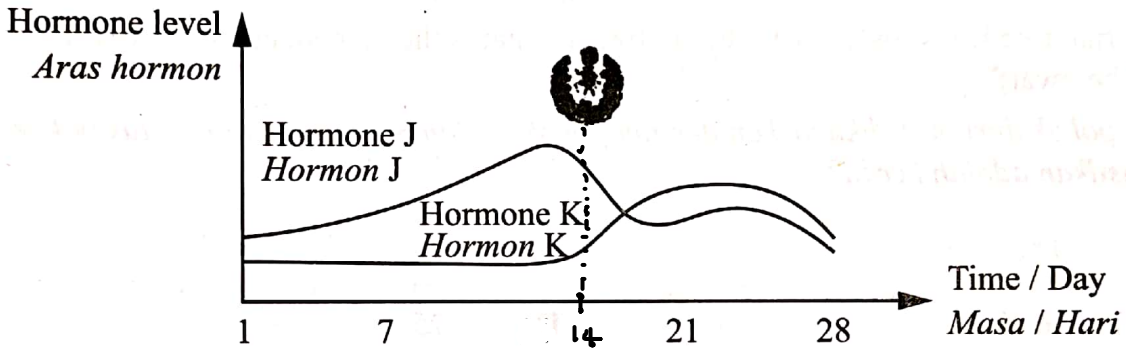


Diagram 26
Rajah 26

Which of the following statements is correct?
Antara pernyataan yang berikut, yang manakah benar?

I A rise in the level of hormone J repairs and thicken the endometrium lining
Peningkatan aras hormon J *memulih dan menebalkan lapisan endometrium*

II A drop in the level of hormone J induces a drop in the level of hormone K
Penurunan aras hormon J *mengaruh penurunan aras hormon* K

III A rise in the level of hormone K stimulates ovulation
Peningkatan aras hormon K *merangsang pengovulan*

IV A drop in the level of hormone K stimulates menstruation
Penurunan aras hormon K *merangsang haid*

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

45 Diagram 27 shows a monohybrid cross between durian tree P and durian tree Q. 50 % of the offspring are tall and 50 % are dwarf.

Rajah 27 menunjukkan kacukan monohibrid antara pokok durian P *dengan pokok durian* Q. 50 % *daripada anaknya adalah tinggi dan* 50 % *lagi adalah kerdil.*

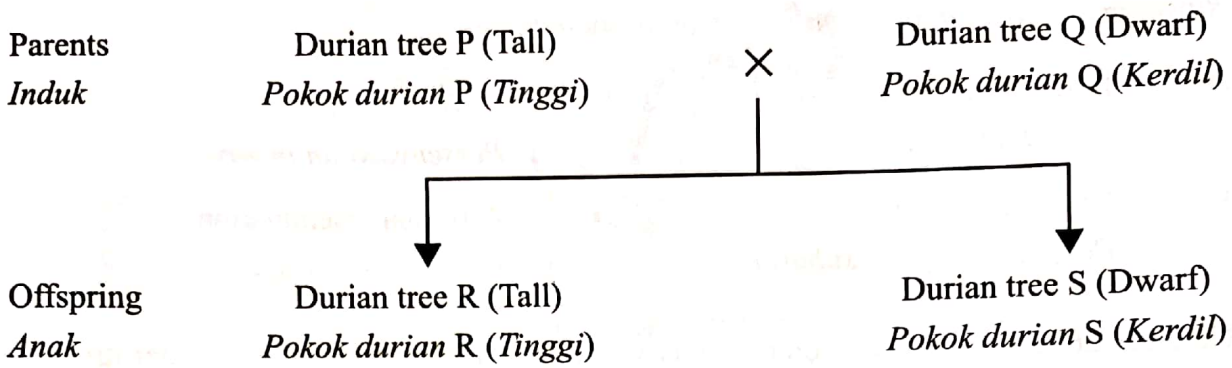


Diagram 27
Rajah 27

If durian tree R is crossed with durian tree S, what is the percentage of the durian trees produced will be dwarf?

Jika pokok durian R *dikacukkan dengan pokok durian* S, *berapakah peratus pokok durian yang dihasilkan adalah kerdil*?

A 0 %

B 25 %

C 50 %

D 75 %

46 A married couple has different rhesus Rh factors. Their first child is a Rh+. All the subsequent pregnancies end with miscarriages.

Determine the rhesus factors for the parents and the miscarriage foetus.

Sepasang suami isteri mempunyai faktor rhesus Rh *yang berbeza. Anak pertama mereka adalah* Rh+. *Semua kandungan seterusnya berakhir dengan keguguran.*

Tentukan faktor rhesus bagi ibu bapa dan fetus yang gugur.

	Father ***Bapa***	**Mother** ***Ibu***	**Miscarriage foetus** ***Fetus yang gugur***
A	Rh+	Rh–	Rh–
B	Rh+	Rh–	Rh+
C	Rh–	Rh+	Rh+
D	Rh–	Rh+	Rh–

47 The following information shows the alleles belonging to a pair of married couple.
Maklumat berikut menunjukkan alel dipunyai oleh pasangan suami isteri.

B – Dominant allele for normal eyesight.
Alel dominan penglihatan normal.

b – Recessive allel for colour blindness.
Alel resesif buta warna.

Which of the following crosses produces male progeny who all inherits colour blindness?
Antara kacukan berikut, yang manakah menghasilkan keturunan lelaki yang semuanya mewarisi buta warna?

A $X^bY \times X^BX^b$ **B** $X^BY \times X^BX^b$

C $X^bY \times X^BX^B$ **D** $X^BY \times X^bX^b$

48 Which of the following is a discontinuous variation?
Antara berikut, yang manakah merupakan variasi tak selanjar?

I Able to roll the tongue
Boleh menggulung lidah

II Ear lobe shape
Bentuk cuping telinga

III Have cheek dimple
Mempunyai lesung pipit

IV Blood group
Kumpulan darah

A I and II
I *dan* II

B III and IV
III *dan* IV

C I, II and IV
I, II *dan* IV

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

49 Diagram 28 shows the variation of a trait P in humans.
Rajah 28 menunjukkan variasi suatu trait P pada manusia.

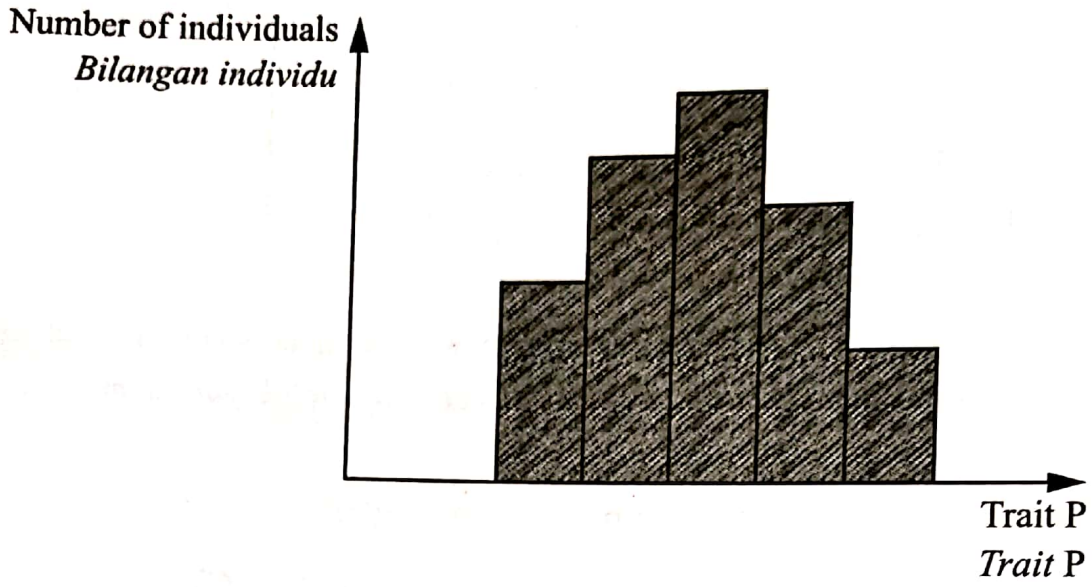


Diagram 28
Rajah 28

Which of the following is true about the variation of trait P?
Antara berikut, yang manakah benar mengenai variasi trait P?

A Involve only a pair of genes
Melibatkan hanya sepasang gen

B Involves clear differences in the traits between individuals
Melibatkan perbezaan trait yang jelas antara individu

C Influenced by environmental factors only
Dipengaruhi oleh faktor persekitaran sahaja

D Influenced by genetic and environmental factors
Dipengaruhi oleh faktor genetik dan faktor persekitaran

50 Diagram 29 shows the distribution of a characteristic in human population.
Rajah 29 menunjukkan taburan satu ciri dalam populasi manusia.

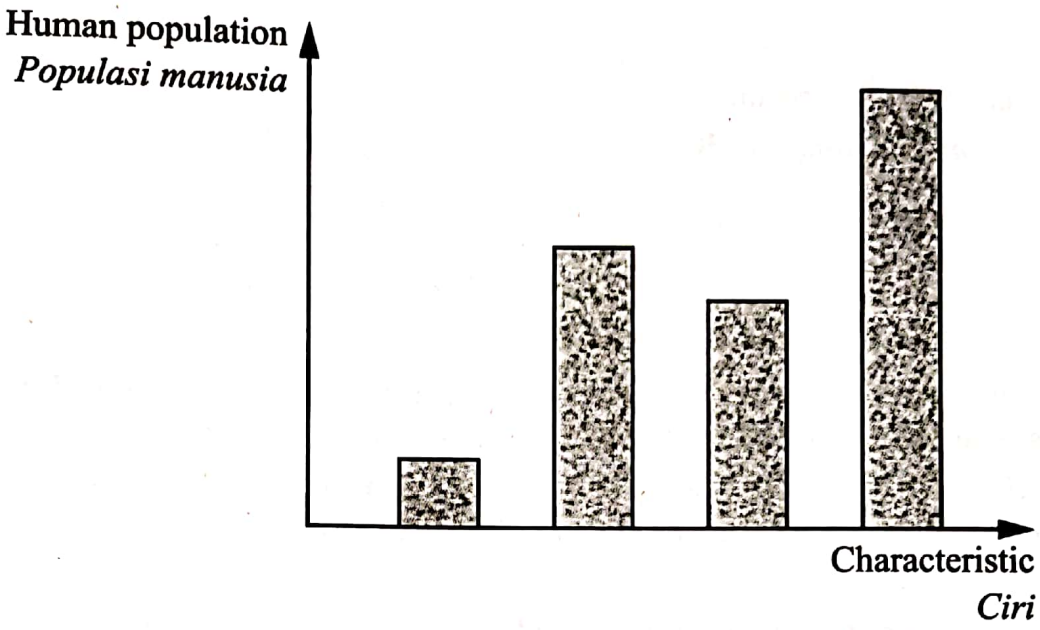


Diagram 29
Rajah 29

Which of the following characteristics is shown by the chart?
Antara ciri-ciri berikut, yang manakah ditunjukkan oleh carta itu?

A Height
Ketinggian

B Body size
Saiz badan

C Skin colour
Warna kulit

D Blood group
Kumpulan darah

END OF QUESTION PAPER
KERTAS PEPERIKSAAN TAMAT

★★

MODUL PINTAS
TINGKATAN 5

4551/1

BIOLOGY
Kertas 1

$1\frac{1}{4}$ jam

Satu jam lima belas minit

SKEMA JAWAPAN
BIOLOGY K1
4551/1

SKEMA PEMARKAHAN

PEPERIKSAAN PERCUBAAN SPM 2020

BIOLOGI KERTAS 1

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

NO. KAD PENGENALAN | | | | | | | - | | | - | | | | |

ANGKA GILIRAN | | | | | | | | | |

Nama ..... Tingkatan .....

Sekolah .....

MODUL PINTAS
TINGKATAN 5

4551/2

BIOLOGY
Kertas 2

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

Dua jam tiga puluh minit

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. *Tulis* **nombor kad pengenalan, angka giliran, nama, tingkatan** *dan* **sekolah** *anda pada petak yang disediakan.*
2. *Kertas peperiksaan 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 Inggeris atau bahasa Melayu.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas peperiksaan ini.*

Untuk Kegunaan Pemeriksa			
Kod Pemeriksa:			
Bahagian	Soalan	Markah Penuh	Markah Diperoleh
A	1	12	
	2	12	
	3	12	
	4	12	
	5	12	
B	6	20	
	7	20	
	8	20	
	9	20	
Jumlah			

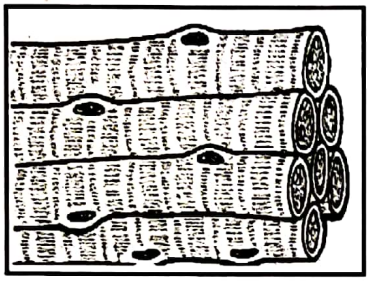
Kertas peperiksaan ini mengandungi 30 halaman bercetak dan 2 halaman tidak bercetak.

Section A
Bahagian A

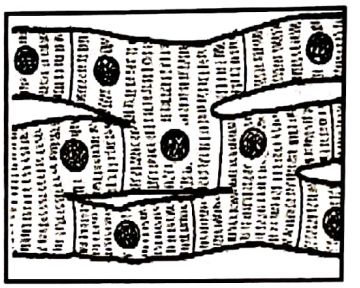
[60 *marks*]
[60 *markah*]

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

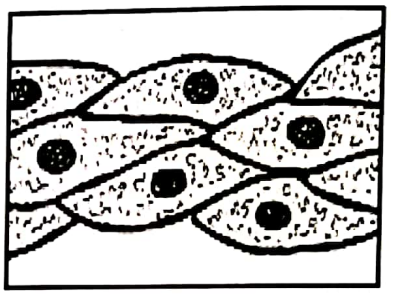
1 Diagram 1.1 shows three specialized tissues, L, M and N found in human.
Rajah 1.1 *menunjukkan tiga tisu khusus*, L, M *dan* N *yang terdapat pada manusia.*



Tissue L
Tisu L



Tissue M
Tisu M



Tissue N
Tisu N

Diagram 1.1
Rajah 1.1

(*a*) (i) Name tissue L.
Namakan tisu L.

.....

[1 *mark*]
[1 *markah*]

(ii) Explain the role of an organelle found in abundance in tissue L.
Terangkan peranan satu organel yang dijumpai dengan banyak dalam tisu L.

.....

.....

.....

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

For Examiner's Use

(iii) How does exercising able to change the rate of activity in tissue M?
Bagaimanakah bersenam boleh mengubah kadar aktiviti dalam tisu M?

.....

.....

.....

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

1(*a*)(iii) 2

(*b*) (i) Based on Diagram 1.1, state **one** similarity and **one** difference between tissue M and tissue N.
Berdasarkan Rajah 1.1, *nyatakan* **satu** *persamaan dan* **satu** *perbezaan antara tisu* M *dan tisu* N.

Similarity : .....
Persamaan
.....

Difference : .....
Perbezaan
.....

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

1(*b*)(i) 2

(ii) Diagram 1.2 shows tissue N found at the wall of small intestine.
Rajah 1.2 *menunjukkan tisu* N *dijumpai pada dinding usus kecil.*

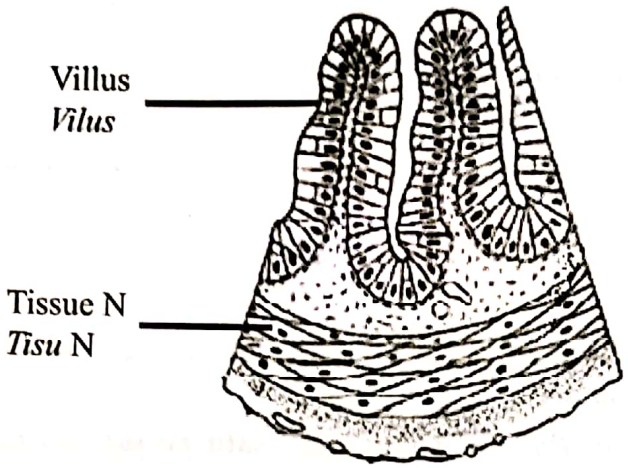


Diagram 1.2
Rajah 1.2

Explain how tissue N helps small intestine to carry out its function.
Terangkan bagaimana tisu N *membantu usus kecil menjalankan fungsinya.*

.....

.....

.....

.....

[3 *marks*]
[3 *markah*]

1(*b*)(ii)
3

For Examiner's Use

(*c*) Diagram 1.3 shows different tissue P, Q and R are produced from umbilical cord stem cells.

Rajah 1.3 *menunjukkan tisu berlainan* P, Q *dan* R *dihasilkan daripada sel stem tali pusat.*

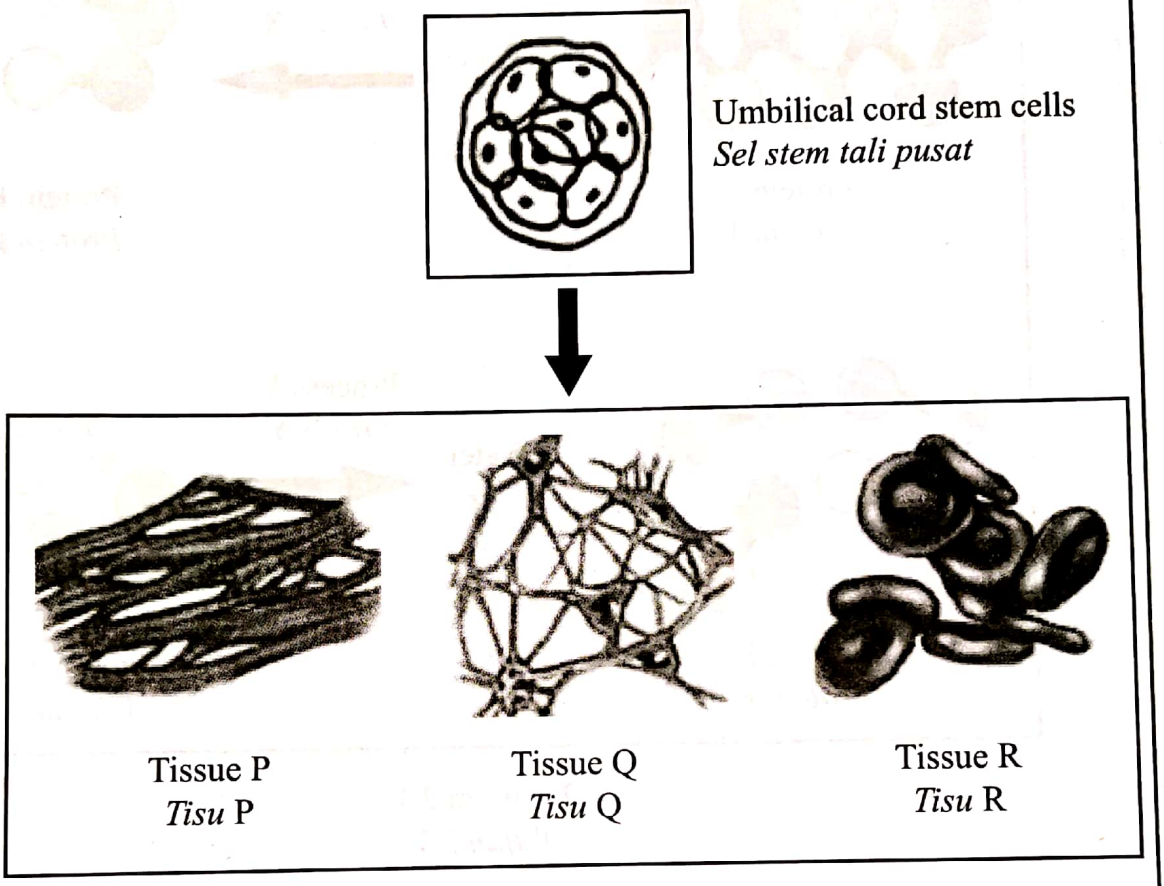


Diagram 1.3
Rajah 1.3

Explain how umbilical cord stem cells are suitable to be used in the production of different types of tissue.

Terangkan bagaimana sel stem tali pusat sesuai untuk digunakan dalam penghasilan pelbagai jenis tisu.

.....

.....

.....

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

1(*c*) 2

Total

2 Diagram 2.1 shows protein J and protein K and the processes of X and Y.
Rajah 2.1 *menunjukkan protein* J *dan protein* K *serta proses* X *dan* Y.

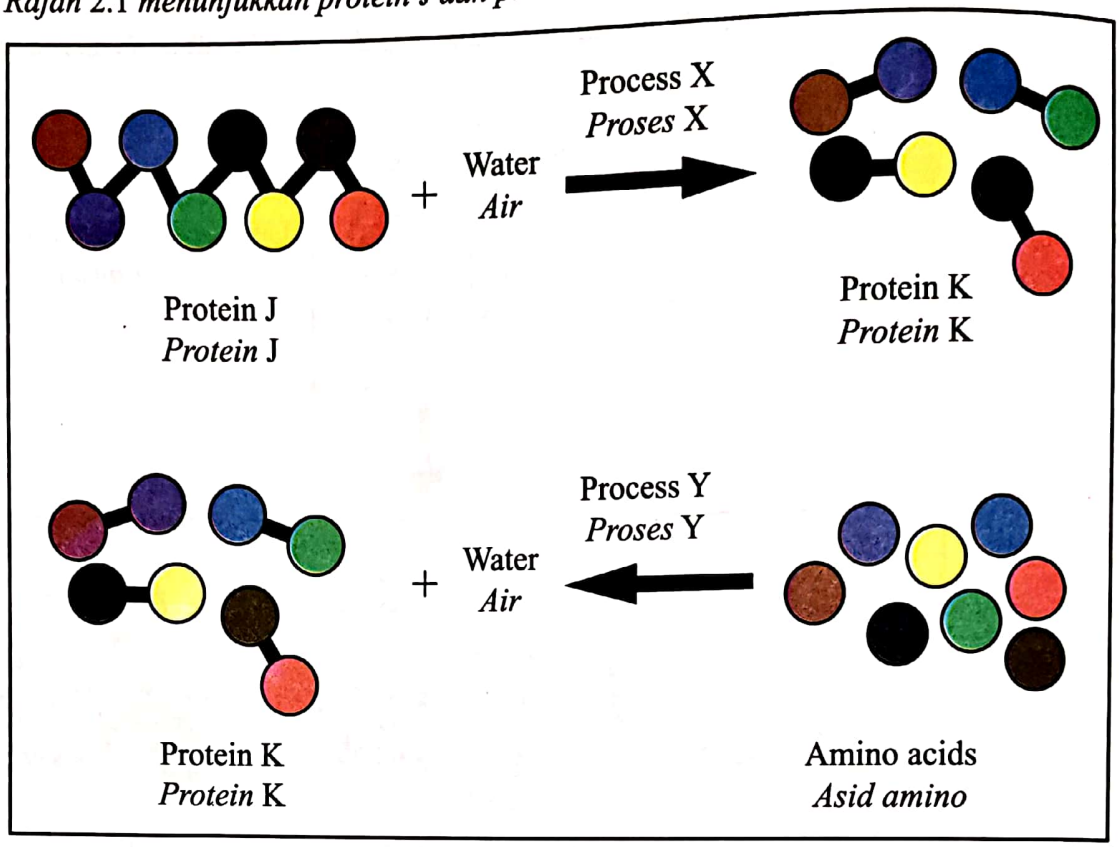


Diagram 2.1
Rajah 2.1

(*a*) (i) State the type of protein and the level of protein structure of protein J.
Nyatakan jenis protein dan aras struktur protein bagi protein J.

Type : .....
Jenis

Level : .....
Aras

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

(ii) Explain process X.
Terangkan proses X.

.....

.....

.....

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

For Examiner's Use

(*b*) Explain **one** difference between process X and process Y.

Terangkan **satu** *perbezaan di antara proses* X *dan proses* Y.

Process X *Proses* **X**	**Process Y** *Proses* **Y**

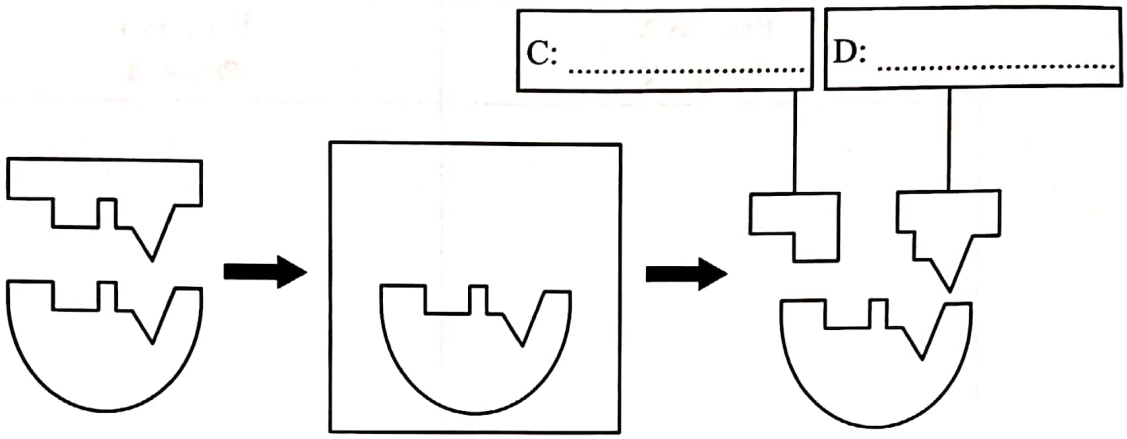
2(*b*)

2

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

(c) (i) Diagram 2.2 shows an enzymatic reaction that involves lactase enzyme.

Rajah 2.2 menunjukkan satu tindak balas enzim yang melibatkan enzim laktase.



Complex B
Kompleks B

Diagram 2.2
Rajah 2.2

Draw the diagram to complete Complex B. Next, name molecules C and D in the spaces provided in Diagram 2.2.

Lukiskan rajah untuk melengkapkan Kompleks B. *Kemudian, namakan molekul* C *dan* D *dalam ruang yang disediakan dalam Rajah* 2.2.

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

(ii)

Lactose intolerance in infant refer to the insufficient lactase secreted by the baby's digestive system. Thus, less hydrolysis of lactose consumed. This condition worsened by the activity of bacteria onto lactose in the baby's small intestine, causes bloatedness and diarrhea.

Intoleransi laktosa dalam bayi merujuk kepada kekurangan laktase dirembeskan oleh sistem pencernaan bayi. Maka, kekurangan hidrolisis ke atas laktosa yang dimakan. Keadaan ini bertambah buruk disebabkan aktiviti bakteria ke atas laktosa dalam usus kecil bayi yang menyebabkan kembung perut dan cirit-birit.

Based on the above statement, explain **one** way to overcome the problem of lactose intolerance in infant.

Berdasarkan pernyataan di atas, terangkan **satu** *cara untuk mengatasi masalah intoleransi laktosa dalam bayi.*

.....

.....

.....

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

For Examiner's Use

(*d*) The following conversations is between a doctor and a student.
Perbualan berikut adalah antara seorang doktor dengan seorang pelajar.

Doctor: You have mild malnutrition and underweight problems.
Doktor: *Anda mengalami malnutrisi ringan dan masalah kurang berat badan.*

Student: Doctor, even though I'm busy as a college student, I still practice balanced diet and meals taken at correct timing.
Pelajar: *Doktor, walaupun saya sibuk sebagai seorang pelajar kolej, saya tetap mengamalkan diet seimbang dan mengambil hidangan pada masa yang betul.*

Doctor: Did you chew your food well?
Doktor: *Adakah anda mengunyah makanan dengan baik?*

Student: I don't think so.
Pelajar: *Rasanya tidak.*

Explain the effect of not chewing food well with the health problems suffered by the student.
Terangkan kesan tidak mengunyah makanan dengan baik dengan masalah kesihatan yang dihidapi oleh pelajar ini.

.....

.....

.....

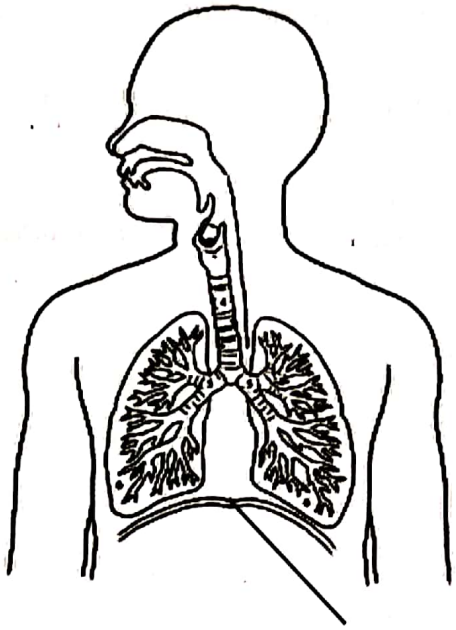
[2 *marks*]
[2 *markah*]

2(*d*)
2

Total
A2
12

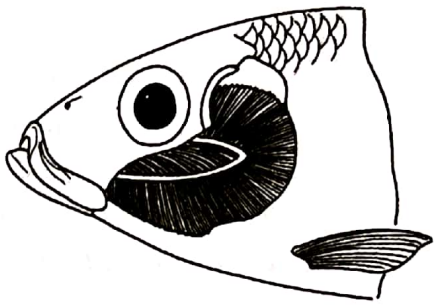
3 Diagram 3.1(*a*) and Diagram 3.1(*b*) show the respiratory organs of two organisms, P and Q.

Rajah 3.1(*a*) *dan Rajah* 3.1(*b*) *menunjukkan organ respirasi bagi dua organisma*, P *dan* Q.



Organism P
Organisma P

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



Organism Q
Organisma Q

Diagram 3.1(*b*)
Rajah 3.1(*b*)

(*a*) Name the respiratory organs for organism P and organism Q.
Namakan organ respirasi bagi organisma P *dan organisma* Q.

Organism P : .....
Organisma P

Organism Q : .....
Organisma Q

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

3(*a*)
2

(*b*) (i) Gaseous exchange takes place across the surface of alveoli of organism P. Explain the importance of gaseous exchange in humans.

Pertukaran gas berlaku merentasi permukaan alveolus bagi organisma P. *Terangkan kepentingan pertukaran gas pada manusia.*

.....

.....

.....

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

(ii) State **one** different between respiratory system of organism P and organism Q.

Nyatakan **satu** *perbezaan antara sistem respirasi organisma* P *dan organisma* Q.

.....

.....

.....

[1 *mark*]
[1 *markah*]

(*c*) Diagram 3.1(*a*) shows a diaphragm that separates the thoracic cavity from the abdomen. The diaphragm plays important roles in the breathing mechanism of humans.

Rajah 3.1(*a*) *menunjukkan diafragma yang memisahkan rongga toraks daripada abdomen. Diafragma tersebut memainkan peranan penting dalam mekanisma pernafasan manusia.*

If the diaphragm is unable to function, explain how this situation affects the breathing mechanism of humans.
Jika diafragma itu tidak dapat berfungsi, terangkan bagaimana keadaan ini memberi kesan kepada mekanisma pernafasan manusia.

.....

.....

.....

.....

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

(*d*) Mr. X is an athlete and a heavy smoker.
Explain the effects of smoking on his heartbeat rate and breathing rate.

Encik X *merupakan seorang atlet dan seorang perokok tegar.*
Terangkan kesan merokok ke atas kadar denyutan nadi dan kadar pernafasannya.

.....

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.....

.....

.....

[3 *marks*]
[3 *markah*]

For Examiner's Use

(*e*) Diagram 3.2 shows paddy plant in a waterlogged paddy field.
Rajah 3.2 *menunjukkan pokok padi yang terendam dalam sawah.*

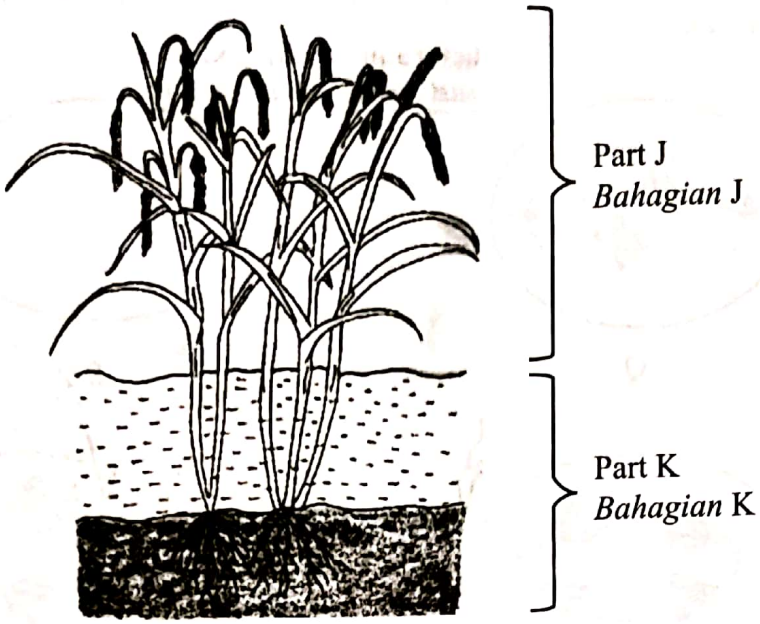


Diagram 3.2
Rajah 3.2

Explain **one** different between all products of respiration by part J and K.
Terangkan **satu** *perbezaan antara semua hasil respirasi oleh bahagian* J *dan* K.

Aspects *Aspek-aspek*	**Part J** *Bahagian* **J**	**Part K** *Bahagian* **K**
All products of respiration *Semua hasil respirasi*		
Explanation *Penerangan*		

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

3(*e*)
2

Total A3
12

4 Diagram 4.1 shows four phases of chromosomes behavior of an animal cell in a type of cell division.

Rajah 4.1 *menunjukkan empat fasa perlakuan kromosom suatu sel haiwan dalam sejenis pembahagian sel.*

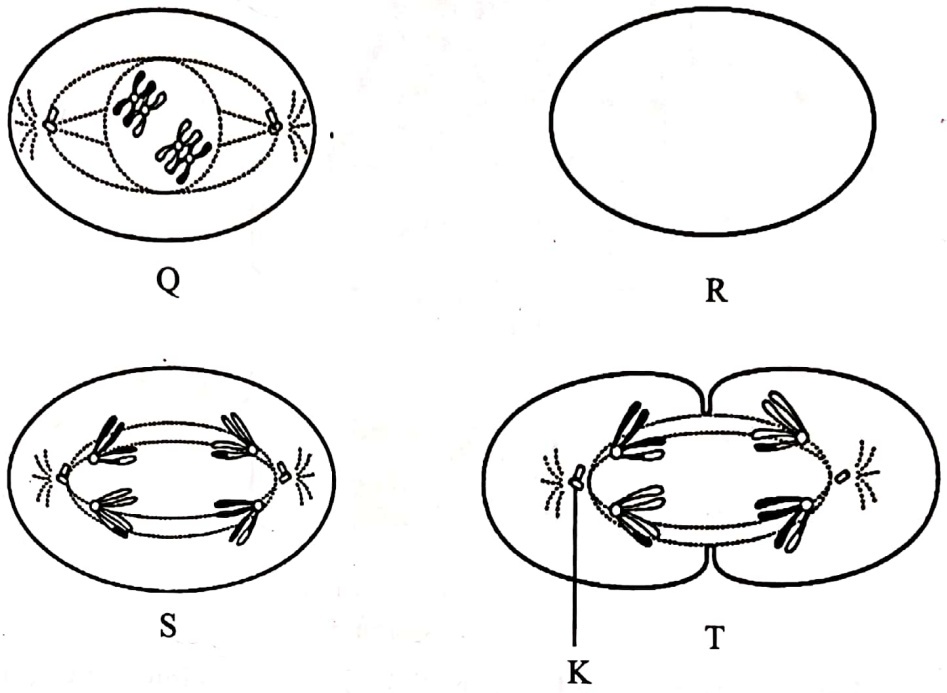


Diagram 4.1
Rajah 4.1

(*a*) (i) Name the type of cell division and phase Q.
Namakan jenis pembahagian sel dan fasa Q.

Type of cell division : .....
Jenis pembahagian sel

Phase Q : .....
Fasa Q

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

(ii) Draw the chromosomal behavior of phase R in Diagram 4.1.
Lukis perlakuan kromosom bagi fasa R dalam Rajah 4.1.

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

(*b*) (i) Some of the structure K damaged during phase S.
Explain the effects to the chromosomal behavior during phase S.

Sebahagian struktur K *telah rosak semasa fasa* S.
Terangkan kesan kepada perlakuan kromosom semasa fasa S.

.....

.....

.....

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

(ii) Puan Sri has a daughter with Down syndrome.
Based on the answer in 4(*b*)(i), explain how her daughter gets the genetic abnormality.
Puan Sri mempunyai seorang anak perempuan yang menghidap sindrom Down.
Berdasarkan jawapan di 4(*b*)(i), *terangkan bagaimana anak perempuannya mempunyai ketidaknormalan genetik.*

.....

.....

.....

.....

[3 *marks*]
[3 *markah*]

(*c*) Diagram 4.2 shows a heart shaped watermelon bought by Shakir.
Rajah 4.2 *menunjukkan sebiji tembikai berbentuk hati yang dibeli oleh Shakir.*

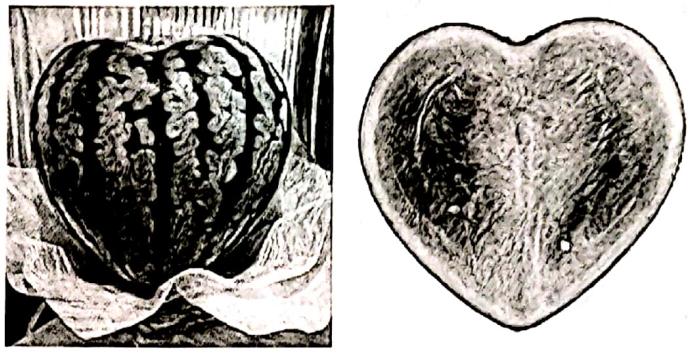


Diagram 4.2
Rajah 4.2

Shakir plans to plant the watermelon seeds.
Predict and explain the shape of the watermelon offspring.
Shakir bercadang untuk menanam biji benih tembikai tersebut.
Ramal dan terangkan bentuk buah tembikai bagi generasi yang baharu.

.....

.....

.....

.....

[3 *marks*]
[3 *markah*]

4(*c*) 3

Total A4 12

For Examiner's Use

5 Diagram 5.1 shows two types of immunity P and Q.
Rajah 5.1 *menunjukkan dua jenis keimunan* P *dan* Q.

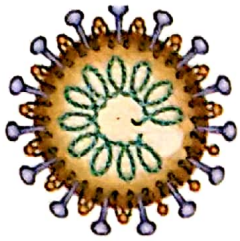
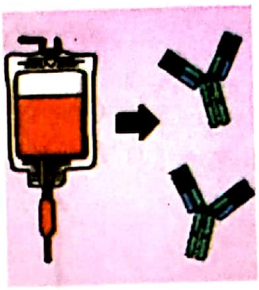
P		Q	
			
Infection *Jangkitan*	Vaccination *Pemvaksinan*	Maternal antibodies *Antibodi ibu*	Ready-made antibodies *Antibodi tersedia*

Diagram 5.1
Rajah 5.1

(*a*) (i) Identify P and Q.
Kenal pasti P *dan* Q.

P : .....

Q : .....

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

5(*a*)(i) 2

(ii) Give reason for your answer in **5**(*a*)(i).
Berikan sebab bagi jawapan anda di **5**(*a*)(i).

.....

.....

.....

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

5(*a*)(ii) 2

(*b*) Diagram 5.2 shows the concentration of antibody in a person's blood after receiving injection of vaccine that contains weakened viruses. The first vaccination was given on first day and second vaccination after 3 months.

Rajah 5.2 *menunjukkan kepekatan antibodi dalam darah seseorang selepas menerima suntikan vaksin yang mengandungi virus yang telah dilemah. Pemvaksinan pertama diberikan pada hari pertama dan pemvaksinan kedua diberikan* 3 *bulan kemudian.*

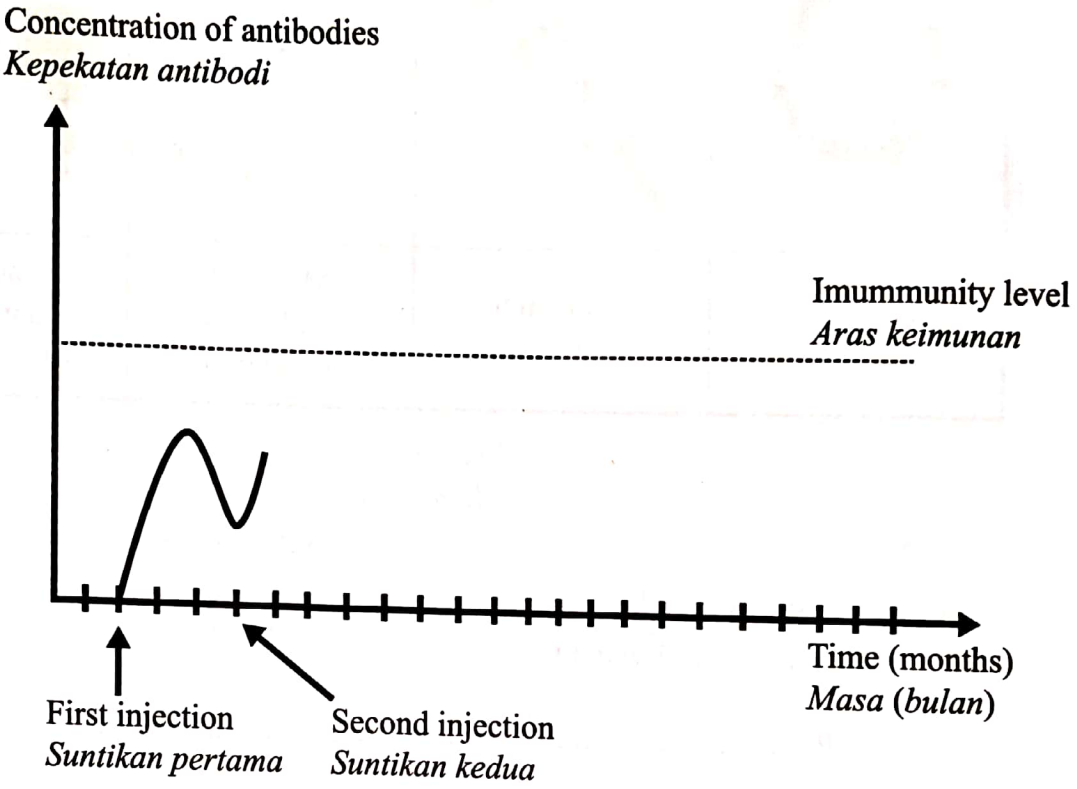


Diagram 5.2
Rajah 5.2

Complete Diagram 5.2 to show the concentration of antibodies after the second injection was obtained by the individual.

Lengkapkan Rajah 5.2 *bagi menunjukkan kepekatan antibodi selepas suntikan kedua diperoleh oleh individu tersebut.*

[1 *mark*]
[1 *markah*]

For Examiner's Use

(*c*) (i) Explain why a second injection is required.
Terangkan mengapa suntikan kedua diperlukan.

.....

.....

.....

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

5(*c*)(i) 2

(ii) Why the virus should be weakened before use?
Mengapakah virus perlu dilemahkan sebelum digunakan?

.....

.....

[1 *mark*]
[1 *markah*]

5(*c*)(ii) 1

(*d*)

- Mrs J has recovered from measles.
  Puan J telah sembuh daripada penyakit demam campak.
- She has immunity to the disease in the future.
  Dia mempunyai keimunan terhadap penyakit tersebut pada masa hadapan.

Discuss this statement.
Bincangkan pernyataan ini.

.....

.....

.....

.....

.....

[4 *marks*]
[4 *markah*]

5(*d*) 4

Total A5 12

Section B
Bahagian B

[40 *marks*]
[40 *markah*]

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

6 (*a*) (i) Coordination allows us to react appropriately towards various changes in the environment.

Explain nervous coordination that produce response. [4 *marks*]

Koordinasi membolehkan kita bertindak balas sewajarnya terhadap pelbagai perubahan dalam persekitaran.

Terangkan koordinasi saraf yang menghasilkan gerak balas. [4 *markah*]

(ii) Diagram 6 shows the thermoreceptor and other structures found on the human skin.

Rajah 6 menunjukkan termoreseptor dan struktur-struktur lain yang terdapat pada kulit manusia.

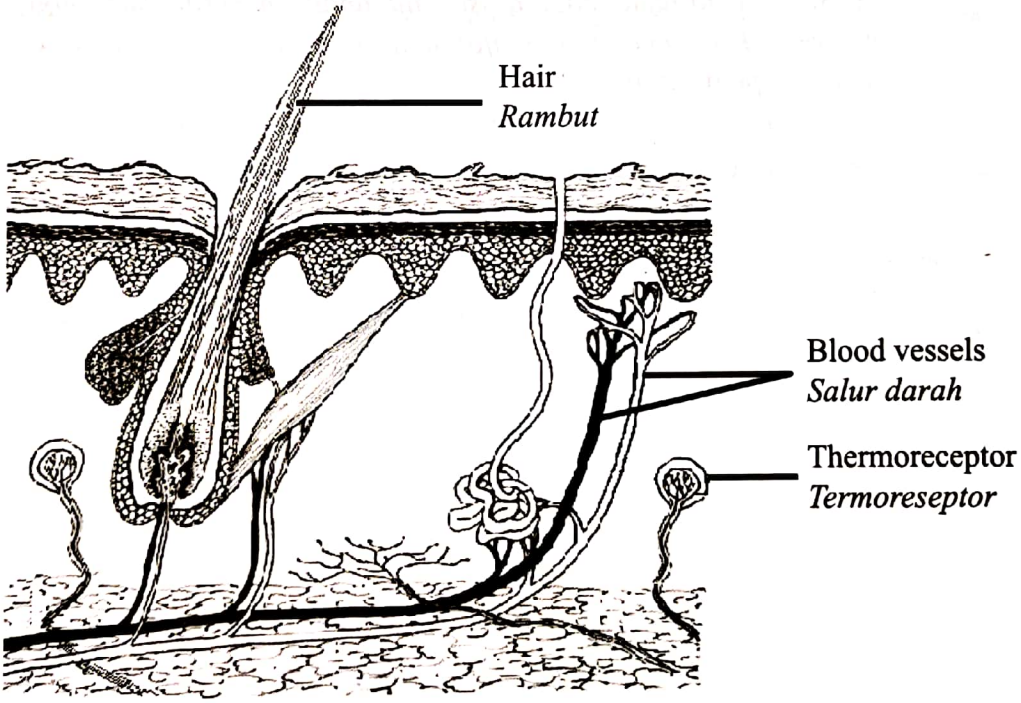


Diagram 6
Rajah 6

Explain how thermoreceptor helps regulate body temperature during a hot day.

Terangkan bagaimana termoreseptor membantu dalam mengawal atur suhu badan semasa hari yang panas.

[10 *marks*]
[10 *markah*]

[Lihat halaman sebelah

(*b*) Ministry of Health Malaysia has launched 'National Action Plan For Healthy Kidneys' as an effort to reduce the number of chronic kidney disease, CKD patients.

Studies conducted by researchers proved that the primary cause of CKD case surge is the increase in diabetes mellitus cases. About 65 % of CKD patients initially suffered with diabetes mellitus.

As a Biology student, you want to create a public awareness so that people can prevent themselves from both diabetes mellitus and CKD by distributing brochures.

Kementerian Kesihatan Malaysia telah melancarkan 'Pelan Tindakan Nasional Untuk Ginjal Sihat' sebagai suatu usaha untuk mengurangkan bilangan pesakit ginjal kronik, CKD.

Kajian yang dijalankan oleh para penyelidik membuktikan bahawa penyebab utama kenaikan mendadak kes CKD *ialah peningkatan kes diabetis melitus. Hampir* 65 % *pesakit* CKD, *pada mulanya adalah menghidap diabetis melitus.*

Sebagai pelajar Biologi, anda ingin mewujudkan kesedaran umum supaya orang ramai dapat mencegah diri mereka daripada menghidap diabetis melitus dan CKD *dengan cara mengedarkan brosur.*

Write facts for the brochure to explain how diabetes mellitus causes kidney failure and how to prevent oneself from suffering both diseases.

Tuliskan fakta-fakta bagi brosur itu untuk menerangkan bagaimana diabetis melitus menyebabkan kegagalan ginjal dan bagaimana mencegah diri daripada menghidap penyakit-penyakit ini.

[6 *marks*]
[6 *markah*]

7 Diagram 7.1 shows parts of a human digestive system.
Rajah 7.1 *menunjukkan sebahagian daripada sistem pencernaan manusia.*

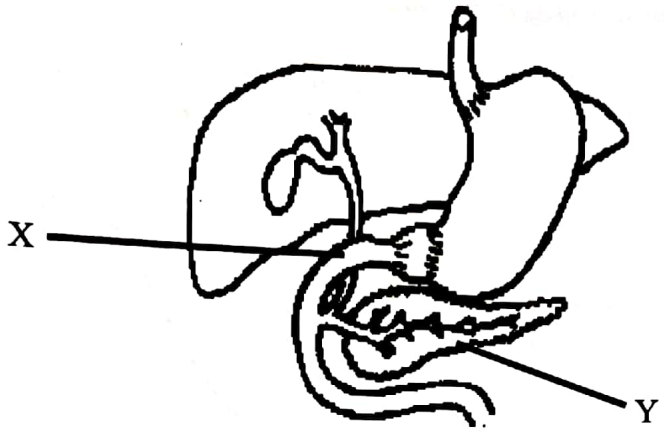


Diagram 7.1
Rajah 7.1

(*a*) (i) Explain the process of food digestion that occur in X. [4 *marks*]
Terangkan proses pencernaan makanan yang berlaku di X. [4 *markah*]

(ii) A man is suffering from cancer that requires his organ Y to be removed.
What he should do to control the health problems that may result from the removal of organ Y? [6 *marks*]
Seorang lelaki menghidap kanser yang memerlukan organ Y *beliau perlu dibuang.*
Apakah yang harus dilakukannya untuk mengawal masalah kesihatan yang mungkin timbul akibat pembuangan organ Y? [6 *markah*]

(*b*) Diagram 7.2(*a*) shows the graph of the effect of light intensity on the rate of photosynthesis.
Diagram 7.2(*b*) shows the graph of the effect of temperature on the rate of photosynthesis.
Rajah 7.2(*a*) *menunjukkan graf kesan keamatan cahaya ke atas kadar fotosintesis.*
Rajah 7.2(*b*) *menunjukkan graf kesan suhu ke atas kadar fotosintesis.*

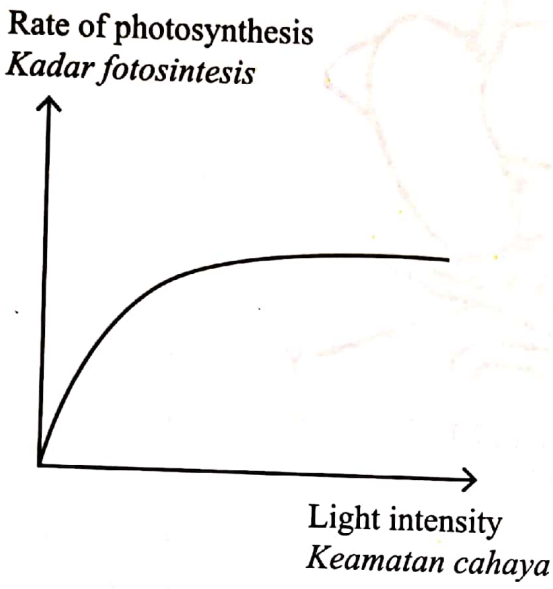


Diagram 7.2(*a*)
Rajah 7.2(*a*)

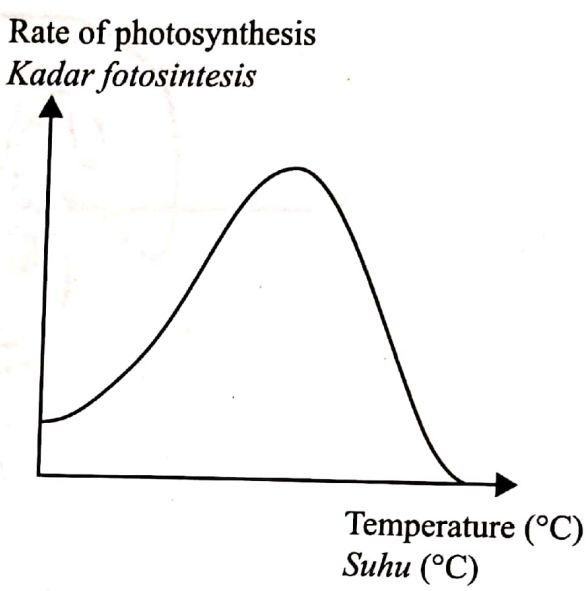


Diagram 7.2(*b*)
Rajah 7.2(*b*)

In tropical countries, the moderate high temperature, abundant rainfall and sunlight throughout the year enable plants to flourish well. In temperate countries with four seasons, the greenhouse is designed to control certain factors as shown in Diagram 7.2(*a*) and Diagram 7.2(*b*), to increase the yield crops.

Di negara tropika, suhu yang sederhana tinggi, hujan yang banyak dan cahaya matahari sepanjang tahun membolehkan tumbuhan hidup subur. Di negara temperat dengan empat musim, rumah hijau direka bentuk untuk mengawal faktor-faktor tertentu seperti yang ditunjukkan dalam Rajah 7.2(*a*) *dan Rajah* 7.2(*b*), *untuk meningkatkan hasil tanaman.*

Explain how the change in light intensity and the environmental temperature can affect the productivity of crops in agriculture.
[10 *marks*]

Terangkan bagaimana perubahan keamatan cahaya dan suhu persekitaran boleh mempengaruhi pengeluaran hasil tanaman dalam pertanian.
[10 *markah*]

8 In an experiment using garden peas, two pairs of alleles were selected which are tall and dwarf, and round seed and wrinkled seed.

Table 8 shows the result which were obtained from four crosses, I, II, III and IV.

Dalam satu eksperimen menggunakan kacang pea, dua pasang alel telah dipilih iaitu tinggi dan kerdil, biji bulat dan biji berkedut.

Jadual 8 *menunjukkan hasil yang diperoleh daripada empat kacukan* I, II, III *dan* IV.

Cross ***Kacukan***	**Parents** ***Induk***	**Offsprings** ***Anak***			
		Tall, round seed ***Tinggi, biji bulat***	**Tall, wrinkled seed** ***Tinggi, biji berkedut***	**Dwarf, round seed** ***Kerdil, biji bulat***	**Dwarf, wrinkled seed** ***Kerdil, biji berkedut***
I	Tall, round seed × dwarf, wrinkled seed *Tinggi, biji bulat × kerdil, biji berkedut*	93	89	91	90
II	Tall, round seed × tall, round seed *Tinggi, biji bulat × tinggi, biji bulat*	119	0	43	0
III	Tall, round seed × tall, wrinkled seed *Tinggi, biji bulat × tinggi, biji berkedut*	65	62	22	20
IV	Dwarf, round seed × tall, wrinkled seed *Kerdil, biji bulat × tinggi, biji berkedut*	368	0	0	0

Table 8
Jadual 8

Keys :
Petunjuk :

T represent dominant allele for tall plant
mewakili alel dominan untuk pokok tinggi

R represent dominant allele for round seed
mewakili alel dominan untuk biji benih bulat

(*a*) (i) Based on Table 8, define Mendel Second Law. [2 *marks*]
Berdasarkan Jadual 8, *berikan definisi Hukum Mendel Kedua.* [2 *markah*]

(ii) Write down the genotypes of the parents of each cross.
Illustrate the inheritance of cross I using schematic diagram. [8 *marks*]
Tulis genotip induk bagi setiap kacukan.
Ilustrasikan pewarisan bagi kacukan I *menggunakan rajah skema.* [8 *markah*]

(*b*) The human ABO blood group system is an example of a characteristic that is controlled by three alleles.

Diagram 8 shows Mr. Kim has blood group AB while his wife Mrs. Mei has blood group O but non of their children has blood group O.

Sistem kumpulan darah ABO *manusia ialah satu contoh ciri yang dikawal oleh tiga alel.*

Rajah 8 *menunjukkan Encik Kim mempunyai kumpulan darah* AB *manakala isterinya, Puan Mei mempunyai kumpulan darah* O *tetapi anak-anak mereka tiada yang mempunyai kumpulan darah* O.

Mr. Kim's blood group AB
Kumpulan darah Encik Kim AB

Mrs. Mei's blood group O
Kumpulan darah Puan Mei O

First child's blood group B
Kumpulan darah anak pertama B

Second child's blood group A
Kumpulan darah anak kedua A

Diagram 8
Rajah 8

Based on Diagram 8, describe why the married couple does not have a child with blood group O. [10 *marks*]

Berdasarkan Rajah 8, *terangkan mengapa pasangan suami isteri itu tidak mempunyai anak yang mempunyai kumpulan darah* O. [10 *markah*]

9 Diagram 9.1 shows a tropical green forest area.
Rajah 9.1 *menunjukkan suatu kawasan hutan hijau tropika.*

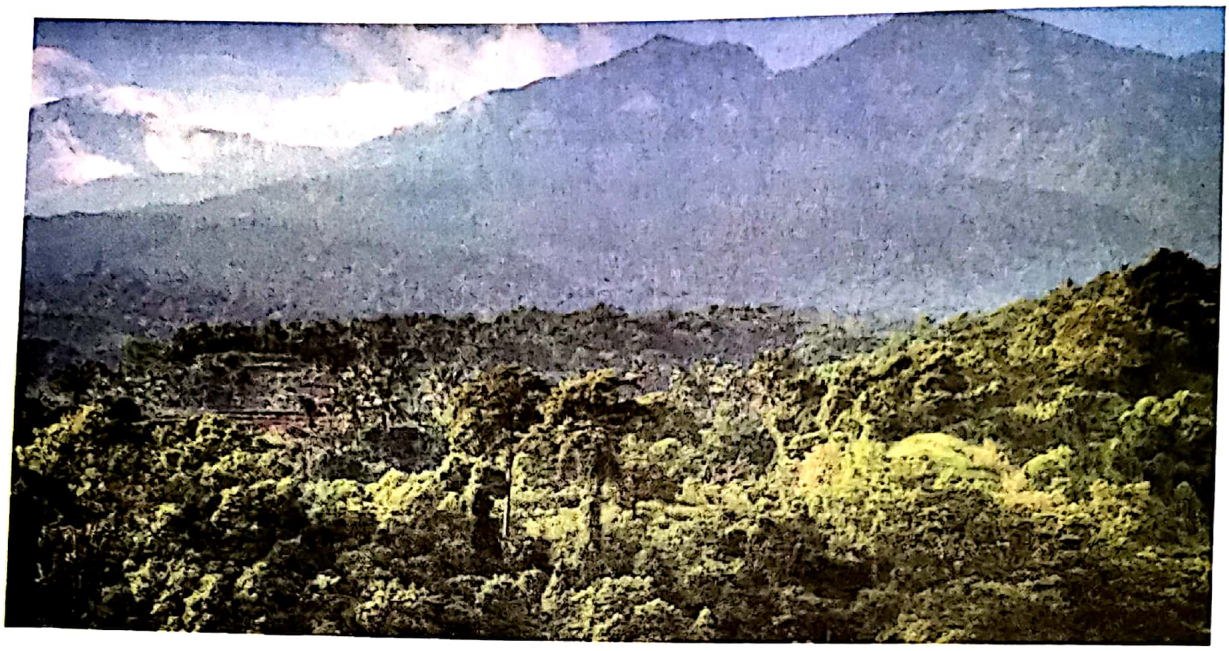


Diagram 9.1
Rajah 9.1

The green belt of tropical rainforests that covers equatorial regions of the South America, Africa, Indonesia and Southeast Asia is turning brown. Since 1990, Indonesia has lost 50 % of its original forest, the Amazon 30 % and Central Africa 14 %. Fires, logging, hunting, contruction of buildings and roads have heavily damaged the forest.

Lajuran hijau hutan hujan tropika yang merangkumi kawasan khatulistiwa di Amerika Selatan, Afrika, Indonesia dan Asia Tenggara didapati semakin berkurangan. Sejak tahun 1990, *negara Indonesia kehilangan* 50 % *daripada hutannya, Amazon kehilangan* 30 % *dan Afrika Tengah sebanyak* 14 %. *Kebakaran, pembalakan, pemburuan, pembinaan bangunan dan jalan raya telah banyak merosakkan hutan ini.*

(*a*) Discuss why ecologists considered the tropical rainforest around the world as a very valuable area and it has to be maintained.
[10 *marks*]
Bincangkan mengapa ahli-ahli ekologi menganggap hutan hujan tropika seluruh dunia sebagai satu kawasan yang sangat berharga dan perlu dikekalkan. [10 *markah*]

(*b*) Diagram 9.2 shows a turtle found stranded and dead at the coastal region.
Rajah 9.2 *menunjukkan seekor penyu yang ditemui terdampar dan mati di persisiran pantai.*

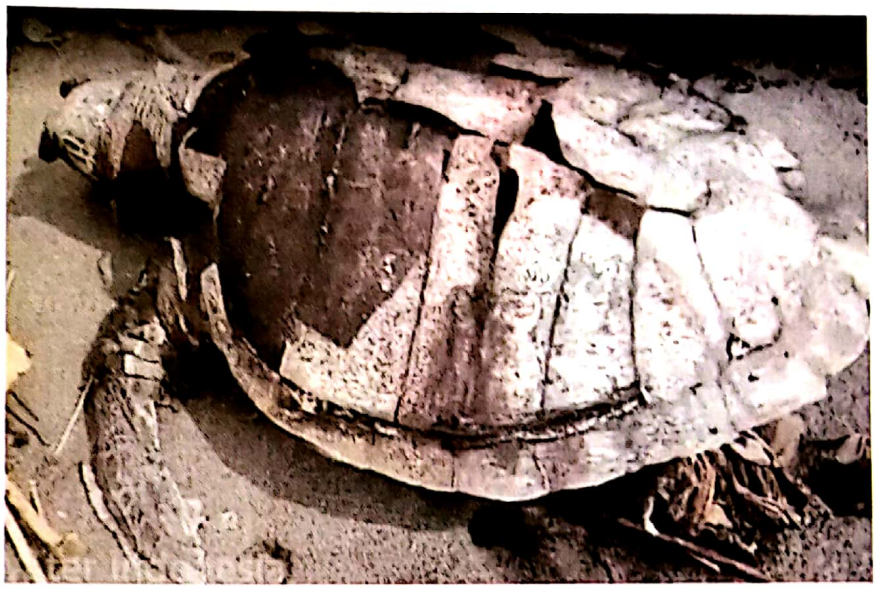


Diagram 9.2
Rajah 9.2

(i) Discuss how human activities causes death of the turtle. [6 *marks*]
Bincangkan bagaimana aktiviti manusia menyebabkan kematian penyu. [6 *markah*]

(ii) Suggest steps that should be taken to overcome this problem. [4 *marks*]
Cadangkan langkah-langkah yang sepatutnya diambil untuk mengatasi masalah ini.
[4 *markah*]

END OF QUESTION PAPER
KERTAS PEPERIKSAAN TAMAT

★★

MODUL PINTAS
TINGKATAN 5

4551/2

BIOLOGY
Kertas 2

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

Dua jam tiga puluh minit

PERATURAN PEMARKAHAN
BIOLOGY K2
4551/2

Peraturan Pemarkahan Biologi Kertas 2 Modul Pintas 2020

Question 1/ *Soalan* 1

No.	Mark Scheme *Skema Markah*	Sub Mark	Total Mark
1(a)(i)	Able to explain nervous coordination correctly. *Dapat menerangkan koordinasi dengan betul.* Sample Answer: *Contohl jawapan:* L : Skeletal muscle (tissue) *(Tisu) Otot rangka*	1	1
1(a)(ii)	Able to explain the role of an organelle found in abundance in L correctly. *Dapat menerangkan peranan satu organel yang dijumpai dengan banyak dalam L dengan betul.* Sample answers: *Contoh jawapan:* P1: (More) Mitochondrion produces **more** energy (*Banyak*) *Mitokondria menghasilkan lebih banyak tenaga* P2: (that is required) for contraction of L / skeletal muscle (tissue) (*yang diperlukan) untuk pengecutan L / (tisu) otot rangka* P3: enables movement. *Membolehkan pergerakan*	1 1 1 P1+P2/P3	2
1(a)(iii)	Able to explain how exercising change the rate of activity in tissue M correctly. *Dapat menerangkan bagaimana beriadah mengubah kadar aktiviti dalam tisu* M *dengan betul.* Sample Answers: *Contoh Jawapan:* P1: Exercising increases the rate of contraction of M / cardiac muscle (tissue) *Beriadah meningkatkan kadar pengecutan* M */ (tisu)otot kardiak* P2: heartbeat rate increases *Kadar denyutan jantung meningkat* P3: heart pumps oxygenated blood rapidly *jantung mengepam darah beroksigen dengan cepat* P4: more oxygen transported to L / muscles / body cells *lebih banyak oksigen diangkut ke L / otot / sel-sel badan*	1 1 1 1	3

1(b)(i)	Able to state one similarity and one difference between tissue M and tissue N correctly. *Dapat menyatakan satu persamaan dan satu perbezaan antara tisu* M *dan tisu* N *dengan betul.* Sample Answers: *Contoh Jawapan:* Similarity *Persamaan* P1: M and N / both are muscle tissues *M dan N / kedua-duanya ialah tisu otot* P2: M and N / both can contract (and relax) *M dan N / kedua-duanya boleh mengecut (dan mengendur)* P3: M and N / both enable movement *M dan N / kedua-duanya boleh membolehkan pergerakan* Difference: Perbezaan: D1: M is cardiac muscle (tissue), whereas N is smooth muscle (tissue) *M ialah (tisu) otot kardiak, manakala N ialah (tisu) otot licin* D2: M is found in the (wall of) heart, whereas N is found in the (wall of) vessels / tubes *M didapati dalam (dinding) jantung, manakala N didapati dalam (dinding) salur darah / tiub* D3: Contraction of M causes heartbeat, whereas contraction of N causes peristalsis. *Pengecutan M menyebabkan denyutan jantung, manakala pengecutan N menyebabkan peristalsis* D4: Rate of contraction of M can change / might be low or high,whereas the rate of contraction of N is slow. *Kadar pengecutan M boleh berubah / boleh jadi rendah atau tinggi, manakala kadar pengecutan N adalah rendah.*	1 1 1 Any 1 1 1 1 1 Any 1	2
1(b)(ii)	Able to explain how tissue N helps small intestine to carry out its function correctly. *Dapat menerangkan bagaimana tisu* N *membantu usus kecil menjalankan fungsinya dengan betul.* Sample Answers: *Contoh Jawapan:* P1: N / smooth muscle (tissue) contracts <u>and</u> relaxes *N / (Tisu) Otot licin mengecut <u>dan</u> mengendur* P2: causes peristalsis *menyebabkan peristalsis*	1 1 1	

	P3: more hydrolysis / digestion of food / example of food occurs *lebih banyak hidrolisis / pencernaan makanan / contoh makanan berlaku* P4: More nutrients absorbed across the villi *lebih banyak nutrient diserap (melalui vilus)* P5: undigested food will be forced / pushed to move into the large intestine / colon *Makanan yang tidak tercerna akan dipaksa / ditolak bergerak memasuki usus besar / kolon*	1 1 Any 2	2
1 (c)	Able to explain how umbilical cord stem cells are suitable to be used in the production of different types of tissue correctly. *Dapat menerangkan bagaimana sel stem tali pusat sesuai untuk digunakan dalam penghasilan pelbagai jenis tisu dengan betul.* Sample answers: *Contoh soalan:* P1: Umbilical cord stem cells are able to carry out cell division /cell differentiation *Sel stem tali pusat dapat menjalankan pembahagian sel / pembezaan sel* P2: to produce specialized tissues / example of tissue / P/Q/R *Untuk menghasilkan tisu yang khusus / contoh tisu / P/Q/R* P3: that are genetically identical *Yang seiras secara genetik* P4: (and) able to carry out specific function / example *(dan) dapat menjalankan fungsi khusus / contoh*	1 1 1 1 Any 2	2
			12

Question 2/ *Soalan* 2

<table>
<tr><th>No.</th><th>Mark Scheme
Skema Markah</th><th>Sub Mark</th><th>Total Mark</th></tr>
<tr><td>2(a)(i)</td><td>Able to state the type of protein and the level of protein structure of Protein J correctly.
Dapat menyatakan jenis protein dan aras struktur protein bagi Protein J dengan betul.

Sample Answer:
Contoh jawapan:

Type of Protein J: Polypeptide
Jenis Protein J: Polipeptida

Level of structure of Protein J: Secondary protein structure
Aras struktur Protein J: Struktur protein sekunder</td><td>1</td><td>1</td></tr>
<tr><td>2(a)(ii)</td><td>P1: Process X is hydrolysis
Proses X ialah hidrolisis

P2: Protein J / polypeptide is broken down by / reacts with (4) water (molecule)
Protein J / polipeptida diuraikan oleh / bertindak balas dengan (4 molekul) air

P3: Peptide bond is broken down
Ikatan peptida diputuskan

P4: (4) dipeptide (molecules) produced
(4 molekul) dipeptida dihasilkan</td><td>1

1

1

1

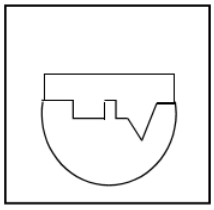
Any 2</td><td>2</td></tr>
<tr><td>2(b)</td><td>Able to explain the difference between Process X and Process Y correctly.
Dapat menerangkan perbezaan antara Proses X dan Proses Y dengan betul.

Sample Answers:
Contoh Jawapan:

<table>
<tr><th></th><th>Process X
Proses X</th><th>Process Y
Proses Y</th></tr>
<tr><td>P1</td><td>Hydrolysis occurs
Hidrolisis berlaku</td><td>Condensation occurs
Kondensasi berlaku</td></tr>
<tr><td>P2</td><td>Water is used / added
Air digunakan / ditambahkan</td><td>Water is produced / released
Air dihasilkan / dibebaskan</td></tr>
<tr><td>P3</td><td>Polipeptide is broken down into dipeptides //</td><td>A polipeptida is produced from dipeptides //</td></tr>
</table>
</td><td>1

1

1</td><td>2</td></tr>
</table>

		Dipeptides is produced from a polypeptide *Polipeptida diuraikan kepada dipeptida //* *Dipeptida dihasilkan daripada polipeptida*	Dipeptides combine to produce a polypeptide *Polipeptida dihasilkan daripada dipeptida //* *Dipeptida bergabung untuk membentuk polipeptida*	Any 2	
2(c)(i)	Able to draw a diagram to complete Complex B, next, name molecules C and D correctly. *Dapat melukis rajah untuk melengkapkan Kompleks B, kemudian, menamakan molekul C dan D dengan betul.* Sample Answer: *Contoh Jawapan:* Complex B diagram *Rajah Kompleks B*  C : galactose // glucose *galaktosa // glukosa* + D: glucose // galactose *glukosa // galaktosa*			1 1	2
2(c)(ii)	Able to explain one way to overcome the problem of lactose intolerance in infant correctly. *Dapat menerangkan satu cara untuk mengatasi masalah intoleransi laktosa dalam bayi dengan betul.* Sample Answers: *Contoh Jawapan:* F1: Baby should consume / be given lactose free formula milk. *Bayi patut minum / diberikan susu formula tanpa laktosa.* P1: (without lactose), there is no need for the small intestine / digestive system to hydrolyse lactose. *(Tanpa laktosa) tiada keperluan untuk usus kecil / sistem pencernaan menghidrolisis laktosa.* F2: Baby should consume / be given soy base formula milk. *Bayi patut minum / diberikan susu formula berasaskan soya.* P2: Soy milk does not contain lactose *Susu soya tidak mengandungi laktosa* F3: Baby should not consume / not be given breast milk / dairy milk/ products *Bayi tidak patut minum / tidak diberikan susu ibu / susu / produk tenusu.* P3: Breast milk/ dairy milk / products contain lactose. *Susu ibu/ susu / produk tenusu mengandungi laktosa.*			1 1 1 1 1 1 F1/F2/F3 + any 1P	2

2 (d)	Able to explain the effect of not chewing food well with the health problems correctly. *Dapat menerangkan kesan tidak mengunyah makanan dengan baik dengan masalah kesihatan dengan betul.* Sample answers: *Contoh jawapan:* P1: Total surface area / TSA / TSA/V of (partially chewed) food is small. *Jumlah luas permukaan / JLP / JLP/L makanan (separa kunyah) kecil* P2: Less enzymatic reaction / hydrolysis / suitable example eg: less starch hydrolysed by amylase *Kurang tindak balas enzim / hydrolisis / contoh sesuai cth: kurang kanji dicernakan oleh amilase* P3: Indigestion occurs *Ketidakcernaan berlaku* P4: Less digested food / nutrients absorbed / transported / assimilated (by body cells) *Kurang makanan tercerna / nutrien diserap / diangkut / diasimilasikan (oleh sel-sel badan)*	1 1 1 1 Any 2	2
			12

Question 3/ *Soalan* 3

No.	Mark Scheme *Skema Markah*	Sub Mark	Total Mark
3 (a)	Able to name the respiratory organs for organism P and Q. *Dapat menamakan organ respirasi bagi organisma* P *dan* Q. Sample answers: *Contoh jawapan*: Organism P : lungs *Organisma* P: *peparu* Organisms Q: Gills *Organisma* Q: *Insang*	 1 1	 2
(b)(i)	Able to explain the importance of gaseous exchange in a human. *Dapat menerangkan kepentingan pertukaran gas dalam manusia.* Sample answers: *Contoh jawapan:* P1 : To supply oxygen for cellular respiration *Untuk membekalkan oksigen bagi menjalani respirasi sel* P2 : To eliminate waste products/carbon dioxide from the cells *Untuk menyingkirkan hasil buangan/ karbon dioksida daripada sel*	 1 1	 2

<table>
<tr>
<td>(b)(ii)</td>
<td>Able to state one different between respiratory system of organisms P and Q.
Dapat menyatakan satu perbezaan antara sistem respirasi organisma P dan Q.

Sample answers:
Contoh jawapan:

<table>
<tr><th></th><th>Organism P
Organisma P</th><th>Organisms Q
Organisma Q</th></tr>
<tr><td>P1</td><td>Gaseous exchange occur at alveoli
Pertukaran gas berlaku di alveolus</td><td>Gaseous exchange occur at lamellae
Pertukaran gas berlaku di lamella</td></tr>
<tr><td>P2</td><td>Lungs are protected by rib cage
Peparu dilindungi oleh sangkar rusuk</td><td>Gills are protected by operculum
Insang dilindungi olek operkulum</td></tr>
<tr><td>P3</td><td>Respiratory organ : lungs
Organ respirasi : peparu</td><td>Organ : gills
Organ : insang</td></tr>
<tr><td>P4</td><td>Air enters the lung through nose/nostril
Udara memasuki peparu menerusi hidung/rongga hidung</td><td>Air enter the opercular chamber through mouth
Udara memasuki ruang eperkulum menerusi mulut</td></tr>
</table>
</td>
<td>1

1

1

1

Any 2</td>
<td>2</td>
</tr>
<tr>
<td>(c)</td>
<td>Able to explain how malfunction diaphragm affects the breathing mechanism.
Dapat menerangkan bagaimana kesan kepada mekanisma pernafasan jika diafragma tidak berfungsi.

Sample answers:
Contoh jawapan:

P1 : Diaphragm cannot contract (and relax) to lower/flattens
Diafragma tidak dapat mengecut (dan mengendur) untuk menjadi lebih rendah/mendatar
P2 : There is no change in the volume// air pressure in the thoracic cavity
Tiada perubahan dalam isipadu// tekanan udara dalam rongga toraks
P3: No gases exchange takes place
Tiada pertukaran gas berlaku
</td>
<td>1

1

1

Any 2</td>
<td>2</td>
</tr>
</table>

<table>
<tr>
<td>(d)</td>
<td>Able to explain the effects of smoking on his heartbeat rate and breathing rate.
Dapat menerangkan kesan merokok terhadap kadar denyutan jantung dan kadar pernafasan.

Sample answers:
Contoh jawapan:

F : Higher heartbeat rate and breathing rate
Kadar denyutan jantung dan kadar pernafasan meningkat
P1 : carbon monoxide (in blood) combine with haemoglobin
Karbon monoksida (dalam darah) bergabung dengan hemoglobin
P2 : cause him to breath faster / and deeper
Menyebabkan pernafasan beliau meningkatkan / dan lebih dalam
P3 : to obtain more oxygen
Untuk mendapatkan lebih oksigen
P4 : Nicotine in blood cause release of adrenaline
Nikotin dalam darah menyebabkan adrenalin dirembeskan
P5 : and make the heart pump faster
dan menjadikan jantung mengepam lebih cepat</td>
<td>1

1

1

1

1

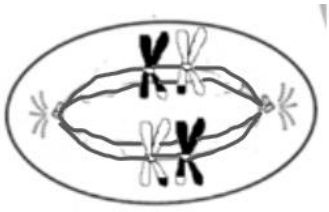
Any 3</td>
<td>3</td>
</tr>
<tr>
<td>(e)</td>
<td>Able to explain one different between all products of respiration by part P and Q
Dapat menerangkan satu perbezaan antara semua hasil respirasi oleh bahagian P dan Q

Sample answers:
Contoh jawapan:

<table>
<tr><th>Aspects
Aspek - aspek</th><th>Part J
Bahagian J</th><th>Part K
Bahagian K</th></tr>
<tr><td>All products of respiration
Semua hasil respirasi</td><td>energy/ ATP, carbon dioxide and water
tenaga/ ATP, karbon dioksida dan air</td><td>energy/ATP, ethanol and carbon dioxide
tenagai/ ATP, etanol dan karbon dioksida</td></tr>
<tr><td>Explanation
Penerangan</td><td colspan="2">complete breakdown/oxidised of glucose// require oxygen (Part A), vice versa
penguraian lengkap/ pengoksidaan glukosa // memerlukan oksigen (Bahagian A), sebaliknya</td></tr>
</table>
</td>
<td>1

1</td>
<td>2</td>
</tr>
<tr>
<td colspan="3"></td>
<td>12</td>
</tr>
</table>

Question 4/ *Soalan 4*

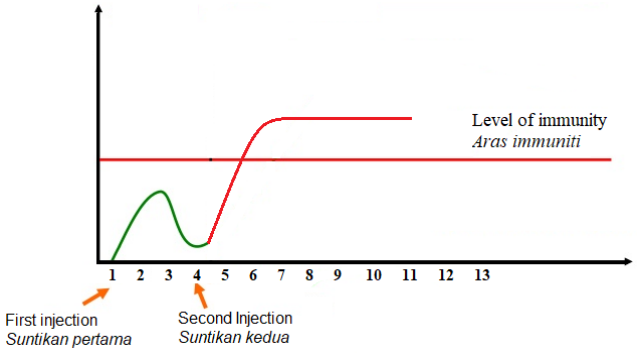
No.	Mark Scheme *Skema Markah*	Sub Mark	Total Mark
4(a)(i)	Able to name the type of cell division and phase Q. *Dapat menamakan jenis pembahagian sel dan fasa Q* Sample answer: *Contoh jawapan:* Type of Cell division: Meiosis // Meiosis I *Jenis Pembahagian sel* Phase Q: Prophase I *Fasa Q: Profasa I* **reject prophase or prophase II*	 1 1	 2
4(a)(ii)	Able to draw the chromosomal behavior of phase R in Diagram 4.1. *Dapat melukis perlakuan kromosom fasa R dalam rajah 4.1* Sample answer: *Contoh jawapan:*  - correct homologous chromosomes arrangement - *susunan kromosom homolog yang betul* - one correct label -*satu label yang betul*	 1 1	 2
4(b)(i)	Able to explain the effects to the chromosomal behavior during phase S. *Dapat menerangkan kesan kepada perlakuan kromosom semasa fasa S* Sample Answers: *Contoh Jawapan:* P1: less spindle fibre is formed/ Spindle fibre is failed to form *kurang gentian gelendung terhasil/ Gentian gelendung* P2: The <u>homologous chromosomes</u> are not pulled (evenly to the opposite poles)/The <u>homologous chromosomes</u> are failed to separate (to the opposite poles) *<u>Kromosom homolog</u> tidak tertarik (dengan sekata ke kutub bertentangan/ <u>Kromosom homolog</u> gagal berpisah (ke kutub bertentangan)*	 1 1	 2

	P3: producing gamete/daughter cells with extra/less/ one/two/three chromosomes *menghasilkan gamet/sel anak yang mempunyai lebih/ kurang/ satu/ dua/ tiga kromosom*	1 Any 2	
4(b)(ii)	Able to explain how Puan Sri daughter gets Down Syndrome. *Dapat menerangkan bagaimana anak Puan Sri mendapat Sindrom Down.* Sample Answers: *Contoh Jawapan:* P1: Gamete with 24 chromosomes fused with gamete with 23 chromosomes. *Gamet dengan 24 kromosom bergabung dengan gamet yang mempunyai 23 kromosom.* P2: fertilization occur *persenyawaan berlaku* P3: the daughter has 47 chromosomes *anak perempuan mempunyai 47 kromosom* P4: extra one chromosome in 21st chromosome/ three chromosome at 21st/ trisomy 21 *satu kromosom berlebihan pada kromosom ke 21/ tiga kromosom pada kromosom ke 21/ trisomy 21*	 1 1 1 1 Any 3	3
4(c)	Able to predict and explain the shape of the watermelon offspring. *Dapat meramal dan menerangkan bentuk tembikai yang baharu* Sample Answers: *Contoh Jawapan:* F1: Round shape. *bentuk bulat.* P2: Heart shaped watermelon cannot be inherited *Tembikai berbentuk hati tidak dapat diwarisi* P3: The shape of the parent is not genetically modified. *Bentuk asal induk tidak diubahsuai secara genetik.* P4: The farmer use a plastic mould to form a heart shaped watermelon. *Petani menggunakan acuan plastik untuk menghasilkan tembikai berbentuk hati.* Or *Atau* F1: heart shape. *bentuk hati.* P2: When the watermelon is still young/small, the shape is round. *Ketika tembikai masih kecil, bentuknya ialah bulat.*	 1 1 1 1 Any 3 1 1	3

	P3: Shakir use a plastic mould to form a heart shaped watermelon. *Shakir menggunakan acuan plastik untuk menghasilkan tembikai berbentuk hati.* **reject if only F*	1	
			12

Question 5/ *Soalan* 5

No.	Mark Scheme *Skema Markah*	Sub Mark	Total Mark
5(a)(i)	Able to identify P and Q. *Dapat mengenalpasti* P *dan* Q. Sample Answer: *Sampel jawapan:* P: Active immunity. *Keimunan aktif.* Q: Passive immunity. *Keimunan pasif.*	 1 1	2
5(a)(ii)	Able to give reason for answer in a(i). *Dapat memberikan sebab bagi jawapan di* (a)(i). Sample answers: *Contoh jawapan:* P1: Active immunity is acquired when body makes its own antibodies in response to stimulation by an antigen *Keimunan aktif diperolehi apabila badan menghasilkan sendiri antibodi sebagai tindakbalas rangsangan kehadiran antigen.* P2: Passive immunity is acquired when body received antibody from an outside source. *Keimunan pasif pula diperolehi apabila badan menerima antibodi dari sumber luar.*	 1 1	2

5(b)	Able to complete Figure 5.2 to show the concentration of antibodies after the second injection was obtained by the individual. *Dapat melengkapkan rajah 5.2 bagi menunjukkan kepekatan antibodi selepas suntikan kedua diperolehi oleh individu tersebut.* Sample Answers: *Contoh Jawapan:*  	1	1
5(c)(i)	Able to explain why a second vaccination is required. *Dapat menerangkan mengapa suntikan kedua diperlukan.* Sample Answer: *Contoh Jawapan:* P1: The first injection does not stimulate sufficient production of antibodies. *Suntikan pertama tidak meransang penghasilan antibodi yang mencukupi.* P2: The second injection will stimulate s a quicker production of antibodies /higher concentration of antibodies *Suntikan kedua akan merangsang penghasilan antibodi yang pantas / kepekatan antibodi yang lebih tinggi* P3: to reach/exceed the level of immunity *untuk mencapai / melebihi tahap imuniti*	1 1 1 Any 2	2
5(c)(ii)	Able to explain why virus has to be made harmless before use. *Dapat menerangkan mengapa virus perlu dilemahkan sebelum digunakan.* Sample Answers: *Contoh Jawapan:* So they don't cause the disease *Supaya virus itu tidak menyebabkan penyakit kepada penerima suntikan vaksin*	1	1

5(d)	Able to discuss why Mrs X has immunity to the diseases in the future. *Dapat membincangkan mengapa Puan* X *mempunyai keimunan terhadap penyakit tersebut pada masa hadapan*. Sample answers: *Sampel soalan:* P1: after the infection, B-lymphocytes remain in the body as memory cells. *Selepas jangkitan , Limfosit-B akan kekal di dalam badan individu.* P2: B-lymphocytes will store information of the pathogens.(measles virus). *Limfosit –*B *akan menyimpan maklumat tentang patogen.*(*virus campak*). P3: the B-lymphocytes help to defend the body against further infection by the same antigen *Sel memori –*B *akan mempertahankan tubuh terhadap jangkitan yang sama.* P4: The body is then said to be immune against the disease. *Badan individu telah mencapai keimunan terhadap penyakit ini.* P5: This is known as natural acquired active immunity. *Ini dikenali sebagai keimunan aktif semulajadi*.	1 1 1 1 Any 4	4
			12

Question 6/ *Soalan 6*

No.	Mark Scheme *Skema Markah*	Sub Mark	Total Mark
6(a)(i)	Able to explain nervous coordination correctly. *Dapat menerangkan koordinasi dengan betul.* Sample answer: *Sampel jawapan:* P1: involves (specific) receptor that (detects and) convert stimulus into impulse *Melibatkan reseptor (spesifik) yang (mengesan dan) menukarkan rangsangan kepada impuls* P2: (impulse is) transmitted via sensory / afferent neurone *(impuls) dihantar melalui saraf deria / aferen* P3: to the central nervous system / brain / spinal cord *ke sistem saraf pusat / otak / saraf tunjang* P4: that interpretes / processes impulse *yang mentafsir / memproses impuls* P5: (next, impulse is) transmitted via motor / efferent neurone *(kemudian, impuls) dihantar melalui saraf motor / eferen* P6: to the effector / muscles / glands / examples *ke efektor / otot / kelenjar / contoh* P7: response carried out towards stimulus *gerak balas dijalankan terhadap rangsangan*	1 1 1 1 1 1 1 Any 4	4

6(a)(ii)	Able to explain how thermoreceptor, structures I, II and III help in regulating body temperature during a hot day correctly. *Dapat menerangkan bagaimana termoreseptor, struktur* I, II *dan* III *membantu dalam mengawal atur suhu badan semasa hari panas dengan betul.* Sample answer: *Contoh jawapan:* P1: Thermoreceptor (detects and) converts stimulus / the increase in (body) temperature into impulse. *Termoreseptor (mengesan dan) menukarkan rangsangan / kenaikan suhu(badan) kepada impuls* P2: Impulse is transmitted to the medulla oblongata / brain to be interpreted /processed *Impuls dihantar ke medula oblongata / otak untuk ditafsir / diproses* P3: Structure I is erector muscle *Struktur I ialah otot regang* P4: (Erector muscle / I) relaxes causes the skin hair to lie / lay down *(Otot regang / I) mengendur menyebabkan bulu roma mendatar / rebah* P5: Trapped air / insulating layer in thin *Lapisan udara terperangkap / penebat menjadi nipis* P6: <u>More</u> heat released to the surrounding <u>*Lebih banyak*</u> *haba dibebaskan ke persekitaran* P7: Structure II is blood capillary / arteriole / vessel *Struktur II ialah kapilari / salur darah / arteriol* P8: (blood capillary / vessel / arteriole / II) undergoes vasodilation / dilates / becomes bigger *(kapilari / salur darah / arteriol / II) menjalani vasodilasi / mengembang / menjadi lebih besar* P9: <u>More</u> blood flows with (more) heat content <u>*Lebih banyak*</u> *darah mengalir dengan kandungan haba (yang lebih banyak)* P10: blood capillary / vessel / arteriole / II is nearer to the skin surface *kapilari / salur darah / arteriol / II lebih hampir dengan permukaan kulit* P11: <u>More</u> heat released to the surrounding <u>*Lebih banyak*</u> *haba dibebaskan ke persekitaran* P12: Structure III is sweat gland *Struktur III ialah kelenjar peluh* P13: (Sweat gland / III) is activated / stimulated to produce / secrete <u>more</u> sweat *(Kelenjar peluh / III) diaktifkan / dirangsang untuk menghasilkan /merembeskan <u>lebih banyak</u> peluh* P14: (more) sweat absorbed excess heat in the body *(lebih banyak) peluh menyerap haba berlebihan dalam badan* P15: (next,) evaporate to (more) water vapour *(kemudian,) menyejat kepada (lebih banyak) wap air*	1 1 1 1 1 1 1 1 1 1 1 1 1 1	10

	P16: leaving the cooling effect // Reduces body temperature *Meninggalkan kesan penyejukan // Menurunkan suhu badan* Note: P6 / P11 – mark awarded once. P6/ P9/ P11 / P13 – at least 'more..' stated once. *Nota: P6 / P11 – markah diberi sekali* *P6/ P9/ P11 / P13 – sekurang-kurangnya 'lebih banyak..' dinyatakan sekali*	1 Any 10	
6(b)	Able to explain how diabetes mellitus causes kidney failure and how to prevent oneself from suffering both diseases correctly. *Dapat menerangkan bagaimana diabetis melitus menyebabkan kegagalan ginjal dan bagaimana mencegah diri daripada menghidap penyakit-penyakit ini dengan betul.* Sample Answers: *Contoh Jawapan:* How does diabetes mellitus cause kidney failure *Bagaimana diabetis melitus menyebabkan kegagalan ginjal* C1: Diabetes mellitus <u>patient</u> has constantly high blood glucose level / is hyperglycaemia *<u>Pesakit</u> diabetis melitus / kencing manis mempunyai aras gula dalam darah yang sentiasa tinggi / adalah hiperglisemia* C2: <u>More</u> glucose has to be reabsorbed by the proximal convoluted tubule into the blood capillary *Lebih banyak glukosa perlu diserap semula oleh tubul berlingkar proksimal ke dalam kapilari darah* C3: by fascilitated diffusion / active transport *secara resapan berbantu / pengangkutan aktif* C4: Glomerulus / Bowman's capsule / proximal convoluted tubule / nephrone / uriniferous tubule might damage. (Reject : Kidney) *Glomerulus / kapsul Bowman / tubul berlingkar proksimal / nefron / tubul uriniferus akan rosak / termusnah (Tolak : Ginjal)* C5: The damage cannot be treated / cured / is irreversible *Kerosakan /kemusnahan tidak dapat dirawat / disembuhkan / tidak berbalik* C6: Kidneys cannot carry out ultrafiltration / reabsorption / filter blood to remove waste product / is malfunction *Ginjal tidak dapat menjalankan ultraturasan / penyerapan semula /menapis darah untuk menyingkirkan bahan kumuh / mengalami malfungsi* C7: Waste product / excess water / body fluid accumulated in the body / cannot be excreted. *Bahan kumuh / air berlebihan / bendalir badan berkumpul*	1 1 1 1 1 1 1	10

	dalam badan / tidak dapat dikumuhkan. How to prevent oneself from suffering both diseases. *Bagaimana mencegah diri daripada menghidap penyakit-penyakit ini.* P1: Control/reduce sugar / sugary/sweetened food/drink intake/consumption to control/reduce blood sugar level. *Kawal / kurangkan pengambilan gula / makanan /minuman yang manis untuk kawal/kurangkan aras glukosa darah.* P2: Drink plenty / 8 glasses of plain water daily to keep hydrated. *Minum banyak / 8 gelas air setiap hari untuk kekal terhidrat* P3: Increase the intake of fruit / vegetable to keep healthy. *Tingkatkan pengambilan buah / sayuran untuk kekal sihat* P4: Exercise regularly / example of exercise to keep fit. *Selalu beriadah / contoh senaman untuk kekal cergas.* P5: Able to manage stress to keep a healthy mind. *Mampu mengurus stres untuk kekal sihat minda.* Note : 5C + 1P / 4C + 2P / 3C + 3P / 2C + 4P/ 1C + 5P	1 1 1 1 1	
			20

Question 7/ *Soalan* 7

No.	Mark Scheme *Skema Markah*	Sub Mark	Total Mark
7(a)(i)	Able to explain the digestion of food that occur in X *Dapat menerangkan pencernaan makanan yang berlaku di* X Sample answers: *Contoh jawapan* : F : X / duodenum receives pancreatic juice from Y / pancreas X / *duodenum menerima jus pankreas dari* Y / *pankreas* P1: pancreatic juice contains pancreatic amylase , trypsin and lipase enzyme *Jus pankreas mengandungi enzim amilase pankreas, tripsin dan lipase* P2: X / duodenum receives bile salts from bile duct X / *duodenum menerima garam hempedu daripada pundi hempedu* P3: bile creates an alkaline medium / provides a suitable pH for enzyme reaction at Y / duodenum *hempedu mewujudkan medium beralkali /menyediakan pH yang sesuai untuk tindakan enzim di* Y / *duodenum* P4: pancreatic amylase hydrolyses starch into maltose *Amilase pankreas menghidrolisis kanji kepada maltosa* P5: trypsin hydrolyses polypeptides into peptides *Tripsin menghidrolisis polipeptida kepada peptida*	1 1 1 1 1 1 Max 6	6

7(a)(ii)	Able to state what should he do to handle health problems that may arise by removing of the organ Y *Dapat menyatakan apa yang perlu dilakukannya untuk menangani masalah kesihatan yang mungkin timbul daripada penyingkiran organ* Y Sample answer: *Contoh jawapan:* F1: Y/ pancreas cannot secrete pancreatic juice *Y / pancreas tidak dapat merembes jus pancreas* P1: there is no pancreatic amylase / trypsin / lipase enzyme *tiada enzim amilase pancreas/ tripsin / lipase* P2: digestion of carbohydrate / protein / lipid is not completed p*encernaan karbohidrat / protein / lipid tidak lengkap* P3: absorption of nutrient / glucose / amino acid/ fatty acids and glycerol will not happened // body cells will lack of nutrients *penyerapan nutrient / glukosa / asid amino/ asid lemak dan gliserol tidak akan berlaku // sel badan akan kekurangan nutrient* F2: no secretion of insulin/glucagon hormone *tiada rembesan hormone insulin/glucagon* regulation of blood sugar level will not occur P4: *kawal atur aras glukosadalam darah tidak berlaku* he should; *dia seharusnya* P5: consume less food that containcarbohydrate /protein/lipid/ /fatty food *kurangkan ambilan makanan yang mengandungi karbohidrat/protein/ lipid/makanan berlemak* P6: insulin injection is needed if blood glucose level is too high *Suntikan insulin diperlukan jika aras glukosa dalam darah terlalu tinggi* P7: injection of glucagon is needed if blood glucose level is too low *Suntikan glukagon diperlukan jika aras glukosa dalam darah terlalu rendah* P8: pancreas transplant *pemindahan pankreas*	1 1 1 1 1 1 1 1 1 1 1 Max 6	6

7(b)	Able to explain how the change in light intensity and the environmental temperature can affect the productivity of crops in agriculture. *Dapat menerangkan bagaimana perubahan pada keamatan cahaya dan suhu persekitaran dapat mempengaruhi pengeluaran hasil tanaman dalam pertanian* Sample Answers: *Contoh Jawapan:* F1: Light intensity and the environmental temperature *keamatan cahaya dan suhu persekitaran* P1: Temperature / light intensity at tropical countries are at their maximum at noon time / very low at night / early morning *suhu/ keamatan cahaya di negara tropika adalah pada nilai maksimum pada waktu tengahari / sangat rendah pada malam / awal pagi* P2: A large increase in light intensity (from the sun) results in a large increase in (environmental) temperature *peningkatan besar dalam keamatan cahaya* (*dari matahari*) *menyebabkan peningkatan besar dalam suhu* (*persekitaran*) F2: light intensity *Keamatan cahaya* P3: The amount of light received by plant determine the amount of food / glucose / organic substance synthesised / made by plants *Jumlah cahaya yang diterima oleh pokok menentukan jumlah makanan / glukosa / bahan organik disintesis / dibuat oleh pokok* P4: the rate of photosynthesis increases with the light intensity // The higher the light intensity the higher the rate of photosynthesis *kadar fotosintesis meningkat dengan peningkatan keamatan cahaya // semakin tinggi keamatan cahaya semakin tinggi kadar fotosintesis* P5: when light intensity is too high, the rate of photosynthesis is constant / saturation point *apabila keamatan cahaya terlalu tinggi, kadar fotosintesis menjadi malar/ titik tepu* P6: due to limiting factor such as carbon dioxide concentration / amount of water / number of stomata / surface area of leaves *disebabkan oleh kepekatan karbon dioksida / jumlah air/ bilangan stoma / luas permukaan daun menjadi faktor penghad* P7: light energy is needed in the photosynthesis // break down of water (molecules) / light reaction in photosynthesis *Tenaga cahaya diperlukan bagi menjalani fotosintesis // memecahkan (molekul) air / tindakbalas cahaya dalam fotosintesis*	1 1 1 1 1 1 1 1 1	10

	P8: in a greenhouse the light intensity is controlled at the optimum rate *dalam rumah hijau keamatan cahaya dikawal pada kadar optimum* F3: environmental temperature *suhu persekitaran* P9: high temperature increase the enzymatic activity s*uhu yang tinggi akan meningkatkan aktiviti enzim* P10: the higher the enzymatic activity make the plant more reproductive / higher rate of photosynthesis *semakin tinggi aktiviti enzim menyebabkan pokok lebih produktif /* *meningkatkan kadar fotosintesis* P11: a greenhouse is designed to trap solar energy in order to maintain the temperature (at range of 25 ºC - 30ºC) / controlled at optimum level *rumah hijau direka bentuk untuk memerangkap tenaga solar bagi mengekalkan suhu (pada julat* 25º C – 30 ºC*) / dikawal pada aras optimum*	1 1 1 1 1 Max 10	
			20

Question 8/ *Soalan 8*

No.	Mark Scheme *Skema Markah*	Sub Mark	Total Mark
8(a)(i)	Able to define Mendel Second Law *Dapat mendefinisikan Hukum Mendel Kedua* Sample answer: *Sampel jawapan:* F1: Each pair of alleles control the trait of organism *Setiap pasang alel mengawal trait sesuatu organisma* P2: alleles TT/Tt/tt control trait tall or dwarf // alleles RR/Rr/rr control trait round or wrinkled seed *alel TT/Tt/tt mengawal trait tinggi atau kerdil//alel RR/Rr/rr mengawal trait biji benih bulat atau berkedut* P3: During gamete formation, each member of allele TT/Tt/tt may combine randomly with either member of pair of allele RR/Rr/rr *Semasa pembentukan gamet, setiap ahli daripada alel TT/Tt/tt boleh bergabung secara rawak dengan mana-mana pasangan alel RR/Rr/rr*	1 1 1 Max 2	2

8(a)(ii)	Able to write down the genotypes of the parents of each cross and illustrate the inheritance of cross I using schematic diagram. *Dapat menulis genotip induk bagi setiap kacukan dan melukis rajah perwarisan bagi kacukan I* Sample Answers: *Sampel jawapan:* Cross / *Kacukan* — Parent genotype / *Genotip Induk* I — TtRr x ttrr (1) II — TtRR x TtRR (1) III — TtRr x Ttrr (1) IV — ttRR x TTrr (1) Parent's genotype / *Genotip induk*: TtRr X ttrr (1) P1 Meiosis P2 Gamete / *Gamet*: TR Tr tR tr ; tr P3 Fertilisation / *Persenyawaan* (1) P4 F1 generation genotype / *Genotip generasi F1*: TtRr Ttrr ttRr ttrr F1 generation phenotype / Fenotip generasi F1: Tall, Round; Tall, wrinkled; Short, Round; Short, wrinkled (1) P5 F1 Phenotype Ratio: 1 : 1 : 1 : 1 (1) * *Gamete must all correct*	Max 8	8
8(b)	Able to describe why the married couple do not have a child with blood group O. *Dapat menerangkan mengapa pasangan suami isteri itu tidak mempunyai anak yang mempunyai kumpulan darah O.* Sample Answers: *Contoh Jawapan:*		

	S1: The human ABO blood group is determined by three alleles, I^A , I^B and I^O *Kumpulan darah manusia* ABO *ditentukan oleh tiga alel,* I^A , I^B *dan* I^O	1	10
	S2: Alleles IA and IB are codominant to each other *Alel* I^A *and* I^B *adalah kodominan bagi satu sama lain*	1	
	S3: and can be expressed equally in the phenotype of the heterozygous individuals. *dan boleh menonjolkan diri dalam fenotip individu yang heterozigot.*	1	
	S4: Allele I^O is recessive *Alel* I^O *adalah resesif*	1	
	S5: The genotype for the mother is I^O I^O *Genotip ibu ialah* I^O I^O	1	
	S6: The genotype for the father is I^AI^B *Genotip bagi bapa ialah* I^AI^B	1	
	S7: The mother will produce one type of gametes, I^O <u>during meiosis</u> *Ibu akan menghasilkan satu jenis gamet,* I^O <u>*semasa meiosis*</u>	1	
	S8: The father will produce two types of gametes, I^A and I^B during meiosis *Bapa akan menghasilkan dua jenis gamet,* I^A *and* I^B *semasa meiosis*	1	
	S9: Random fertilisation / fusion of gametes *Persenyawaan secara rawak / gabungan gamet*	1	
	S10: Produce children's genotype I^AI^O and I^BI^O *Menghasilkan genotip anak* I^AI^O *dan* I^BI^O	1	
	S11: Phenotype ratio of children type of blood group A to B is 1:1// 50% probability of the children is blood group A while 50% probability of the children is blood group B *Nisbah fenotip bagi kumpulan darah A kepada B bagi anak ialah 1:1// 50% kemungkinan anak mempunyai kumpulan darah A dan 50% kemungkinan anak mempunyai kumpulan darah B*	1	
	**Accept schematic diagram for S5,S6,S7,S8,S9,S10,S11 if students write a <u>complete schematic diagram</u>*	Max 10	
			20

Question 9/ *Soalan 9*

No.	Mark Scheme *Skema Markah*	Sub Mark	Total Mark
9(a)	Able to discuss why tropical rainforest is considered by ecologists around the world as a very valuable area and it needs to be maintained. *Dapat membincangkan mengapa Hutan Hujan Tropika dianggap oleh ahli-ahli ekologi seluruh dunia sebagai satu kawasan yang sangat berharga dan perlu dikekalkan*. Sample answer: *Sampel jawapan:* P1: Rainforests as carbon sinks. *Hutan hujan tropika bertindak sebagai kawasan tadahan karbon.* P2: Because they absorb vast amount of carbon dioxide during photosynthesis *Kerana menyerap sejumlah besar karbon dioksida semasa fotosintesis*. P3: Deforestration / removal of a forest from land// slash and burn method *Penyahhutanan /penebangan hutan berleluasa//kaedah tebang dan bakar* P4: With less trees, less carbon dioxide is used in photosynthesis *Apabila pokok berkurangan, kurang karbon dioksida digunakan untuk fotosintesis.* P5: Less photosynthesis also means less oxygen production. *Fotosintesis berkurangan menyebabkan penghasilan gas oksigen turut berkurang.* P6: More carbon dioxide is released (as a result of the burning of trees). *Lebih banyak karbon dioksida bebaskan*(*akibat pembakaran pokok*). P7: This will lead to global warming. *Ini akan menyebabkan pemanasan global berlaku*. P8: Deforestration distrupt normal weather pattern/climate change globally . *Penyahhutanan juga mengubah iklim dunia// menjadikan sesetengah tempat panas dan kering*. P9: Rainforest is also serve as water catchment area. *Hutan hujan tropika juga merupakan kawasan tadahan air*. P10: Cover crops , fallen leaves, and tree branches act as sponges that absorb most of the rainwater. *Tanaman tutup bumi, daun yang gugur, dan ranting kayu*	1 1 1 1 1 1 1 1 1 1	10

	bertindak sebagai span yang menyerap sebahagian besar air hujan.		
	P11: Trees that live along the hillside stabilize the soil// the roots of the tree tie the soil together. *Pokok-pokok yang hidup di sepanjang lereng bukit menstabilkan keadaan tanah/akar pokok mengikat butir-butir tanah bersama.*	1	
	P12: The absence of plant root systems makes the soil structrure unstable. *Tanpa sistem akar yang dapat mencengkam tanah, struktur tanah menjadi tidak stabil.*	1	
	P13: This leads to landslides. *Ini menyebabkan tanah runtuh.*	1	
	P14: Heavy rainfall for a long period of time causes eroded land to be carried by rainwater and deposited at the base of the river. *Hujan lebat untuk suatu jangka masa yang panjang menyebabkan tanah yang terhakis dibawa oleh aliran air hujan dan termendap di dasar sungai.*	1	
	P15: Rainforests is rich in biodiversity. *Hutan hujan kaya dengan kepelbagaian biodiversiti .*	1	
	P16: *Rain forests can supply sustainable crops such as nuts, rubber, fruits and plant oils.* *Hutan hujan tropika boleh membekalkan tanaman mampan seperti kacang, getah, buah-buahan dan minyak tumbuhan.*	1	
	P17: Destruction of rain forests will decrease the rate of transpiration// reduction in rainfall// subsequently disruption of the water cycle. *Pemusnahan hutan hujan akan mengakibatkan kadar transpirasi berkurangan// pengurangan hujan // gangguan kitaran air.*	1	
	P18: Animals lost their habitat. *Haiwan kehilangan habitat.*	1	
	P19: Flora and fauna become extinct. *Kepupusan flora dan fauna berlaku.*	1	
		Max 10	

9(b)(i)	Able to discuss how human activities causes death of the turtle. *Dapat membincangkan bagaimana aktiviti manusia menyebabkan kematian penyu*. Sample Answers: *Sampel jawapan:* P1: Oil spill from ships pollutes the sea water. *Tumpahan minyak daripada kapal mencemarkan laut*. P2 This can cause lack of oxygen in the sea water and kills turtle. *Ini boleh menyebabkan kekurangan oksigen dalam air laut lalu menyebabkan kematian penyu*. P3: Irresponsible visitors that litter at the beach causes pollution on the beach *Pengunjung pantai yang tidak bertangungjawab yang membuang sampah dan mencemarkan kawasan pantai*. P4: The turtle may swallow the plastic waste and dies due to suffocation *Penyu mungkin tertelan sampah plastic dan mati akibat tercekik.* P5: Improper chemical disposal into the sea can also pollutes the water. *Pembuangan sisa kimia yang tidak terurus juga mencemarkan air laut.* P6: This will poison turtles in that area. *Ini akan meracuni penyu yang berada di kawasan itu*. P7: Use of illegal trawler *Penggunaan pukat tunda/ pukat haram*. P8: Causes turtles to get stuck in net and suffer from serious injuries. *Menyebabkan penyu terperangkap dalam jaring dan mengalami kecederaan parah*. P9: Uses of boats for fishing *Penggunaan bot untuk menangkap ikan.* P10: Cause a turtle to get injured *Menyebabkan penyu tercedera akibat terkena kipas bot.*	1 1 1 1 1 1 1 1 1 1 Any 6	6

9(b)(ii)	Able to suggest steps that can be taken to overcome problem. *Dapat mencadangkan cara yang boleh diambil untuk mengatasi masalah kematian penyu*. Sample Answers: *Contoh Jawapan:* P1: Educate the public on the importance of keeping the environment clean *Mendidik orang awam tentang kepentingan memastikan kebersihan persekitaran*. P2 Enforce law against any individual that practices improver waste disposal at sea./ take action against individual that practices improver waste disposal at sea. *Menggubal undang-undang ke atas sebarang individu dan pihak yang mengamalkan pelupusan sampah yang tidak teratur di kawasan laut dan pantai/ mengambil tindakan pada mereka yang melanggar peraturan yang di tetapkan oleh pihak berkuasa dengan berat.* P3: New technology can be use to clean the polluted environment such as oil spill./ use bacteria to clean oil spill. *Teknologi baharu boleh digunakan untuk membersihkn persekitaran yang tercemar seperti tumpahan minyak./ penggunaan bakteria bagi membersihkan tumpahan minyak.* P4: Exhibit 4R campaigns reduce (kurangkan), reuse (guna semula), recycle (kitar semula) dan refuse (tolak) *Melancarkan kempen 4R - reduce (kurangkan), reuse (guna semula), recycle (kitar semula) dan refuse (tolak)* P5: installing garbage traps in the river to prevent them from flowing into the sea. *Memasang perangkap sampah di sungai bagi mengelakkan sampah tersebut mengalir masuk ke dalam laut*. P6: Prohibition of use of plastic bags/ Straw . *Larangan penggunaan beg plastik/ penyedut minuman plastik*.	1 1 1 1 1 1 1 1 1 1 1 1 Any 4	4
			20

END OF MARK SCHEME
SKEMA MARKAH TAMAT

NO. KAD PENGENALAN | | | | | | | - | | | - | | | | |

ANGKA GILIRAN | | | | | | | | | |

Nama ..... Tingkatan .....

Sekolah .....

MODUL PINTAS
TINGKATAN 5

4551/3

BIOLOGY
Kertas 3

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

Satu jam tiga puluh minit

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. *Tulis* **nombor kad pengenalan, angka giliran, nama, tingkatan** *dan* **sekolah** *anda pada petak yang disediakan.*
2. *Kertas peperiksaan 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 Inggeris atau bahasa Melayu.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas peperiksaan ini.*

Untuk Kegunaan Pemeriksa		
Kod Pemeriksa:		
Soalan	Markah Penuh	Markah Diperoleh
1	33	
2	17	
Jumlah	**50**	

Kertas peperiksaan ini mengandungi 12 halaman bercetak.

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

1 *Cornu aspersum* known by a common name garden snail. The population density is affected by various factors such as the abiotic and biotic factors, birth rate, death rate, immigration and emigration.

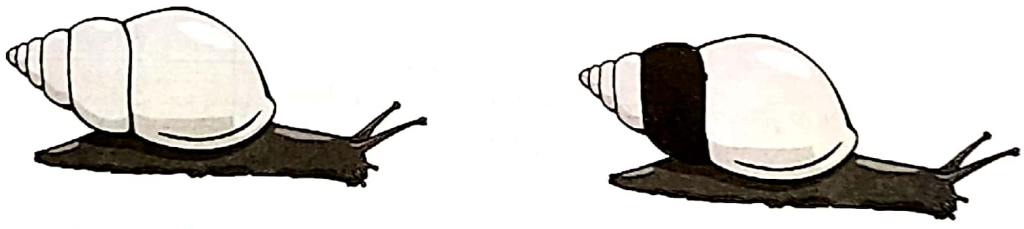
An experiment was carried out to investigate the population size of garden snails in three different areas by using capture, mark, release and recapture technique. A total of 27 garden snails have been found. Each garden snail was marked by using water proof marker pen on the shell. All the garden snails were released back to the place where the garden snails were captured. After 7 days, garden snail at three places were recaptured. The number of garden snail in the second capture was recorded. Also the number of marked garden snail in the second capture was recorded.

The unmarked garden snail and marked garden snail are shown in Diagram 1.

Cornu aspersum dikenali sebagai nama biasanya, siput kebun. Ketumpatan populasi dipengaruhi oleh pelbagai faktor seperti faktor abiotik dan biotik, kadar kelahiran, kadar kematian, penghijrahan masuk dan penghijrahan keluar.

Satu eksperimen telah dijalankan untuk mengkaji saiz populasi siput kebun di tiga kawasan berbeza dengan menggunakan teknik tangkap, tanda, lepas dan tangkap semula. Sebanyak 27 ekor siput kebun telah dijumpai. Setiap siput kebun ditandakan dengan pen penanda yang kalis air pada cangkerangnya. Kesemua siput kebun tersebut dilepaskan semula di tempat siput kebun itu ditangkap. Selepas 7 hari, siput kebun di ketiga-tiga kawasan ditangkap semula. Bilangan siput kebun dalam tangkapan kedua itu direkodkan. Siput kebun bertanda yang ditangkap dalam tangkapan kedua juga direkodkan.

Siput kebun yang tidak bertanda dan siput kebun yang bertanda ditunjukkan dalam Rajah 1.



Unmarked garden snail
Siput kebun yang tidak bertanda

Marked garden snail
Siput kebun yang bertanda

Diagram 1
Rajah 1

Table 1 shows the number of garden snail in second captured and the number of marked garden snail captured in second capture at the lakeside, housing area and paddy field.

Jadual 1 menunjukkan bilangan siput kebun dalam tangkapan kedua dan bilangan siput kebun yang bertanda dalam tangkapan kedua di tepi tasik, kawasan perumahan dan sawah padi.

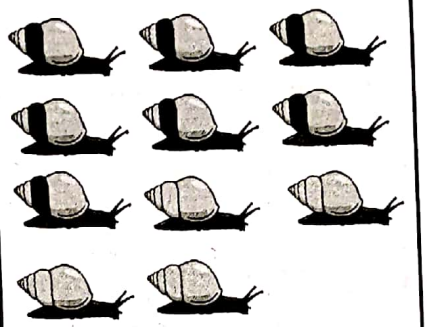
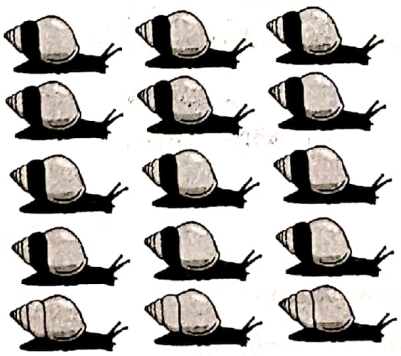
Area of garden snail captured ***Kawasan tangkapan siput kebun***	**Garden snail in the second capture** ***Siput kebun dalam tangkapan kedua***	**Number of garden snail in the second capture** ***Bilangan siput kebun dalam tangkapan kedua***	**Number of marked garden snail in the second capture** ***Bilangan siput kebun yang bertanda dalam tangkapan kedua***
Lakeside *Tepi tasik*			
Housing area *Kawasan perumahan*			
Paddy field *Sawah padi*			

Table 1
Jadual 1

(*a*) Record the number of garden snail in second captured and the number of marked garden snail in second capture in the answer spaces provided in Table 1.

Rekod bilangan siput kebun dalam tangkapan kedua dan bilangan siput kebun bertanda dalam tangkapan kedua di ruang jawapan yang disediakan dalam Jadual 1.

[3 *marks*]
[3 *markah*]

1(*a*) 3

(*b*) (i) State **two** different observations based on Table 1.

Nyatakan **dua** *pemerhatian yang berbeza berdasarkan Jadual* 1.

Observation 1:
Pemerhatian 1:

.....

.....

Observation 2:
Pemerhatian 2:

.....

.....

[3 *marks*]
[3 *markah*]

1(*b*)(i) 3

(ii) State the inference for **each** observation made in 1(*b*)(i).

Nyatakan inferens bagi setiap pemerhatian yang dibuat dalam 1(*b*)(i).

Inference for observation 1:
Inferens terhadap pemerhatian 1:

.....

.....

Inference for observation 2:
Inferens terhadap pemerhatian 2:

.....

.....

[3 *marks*]
[3 *markah*]

1(*b*)(ii) 3

For Examiner's Use

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

Variable ***Pemboleh ubah***	**Method to handle the variable** ***Cara mengendali pemboleh ubah***
Manipulated variable *Pemboleh ubah dimanipulasikan*	....
Responding variable *Pemboleh ubah bergerak balas*	....
Constant variable *Pemboleh ubah dimalarkan*	....

Table 2
Jadual 2

1(*c*) 3

[3 *marks*]
[3 *markah*]

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

.....

.....

.....

1(*d*) 3

[3 *marks*]
[3 *markah*]

(e) (i) Construct a table and record all the data collected from Table 1. Your table should have the following titles:

Bina satu jadual dan rekodkan semua data yang dikumpul dari Jadual 1.

Jadual anda hendaklah mengandungi tajuk-tajuk berikut:

- Area of garden snail captured
  Kawasan tangkapan siput kebun
- Number of garden snail in the first capture
  Bilangan siput kebun dalam tangkapan pertama
- Number of garden snail in the second capture
  Bilangan siput kebun dalam tangkapan kedua
- Number of marked garden snail in the second capture
  Bilangan siput kebun yang bertanda dalam tangkapan kedua
- Population size of garden snail
  Saiz populasi siput kebun

Use the formula:

Gunakan formula:

$$\text{Population size of garden snail} = \frac{(\text{Number of garden snail in the first capture}) \times (\text{Number of garden snail in the second capture})}{\text{Number of marked garden snail in the second capture}}$$

$$\textit{Saiz populasi siput kebun} = \frac{(\textit{Bilangan siput kebun dalam tangkapan pertama}) \times (\textit{Bilangan siput kebun dalam tangkapan kedua})}{\textit{Bilangan siput kebun yang bertanda dalam tangkapan kedua}}$$

1(e)(i)

3

[3 *marks*]
[3 *markah*]

For Examiner's Use

(ii) Use the graph paper provided on page **8** to answer this question.

Using the data in **1**(*e*)(i), draw a bar chart of the population size of garden snail against the area of garden snail captured.

Gunakan kertas graf yang disediakan di halaman **8** *untuk menjawab soalan ini.*

Menggunakan data di **1**(*e*)(i), *lukis sebuah carta bar bagi saiz populasi siput kebun melawan kawasan tangkapan siput kebun.*

[3 *marks*]
[3 *markah*]

1(*e*)(ii) 3

(*f*) Based on bar chart in **1**(*e*)(ii), state the relationship between the area of garden snail captured and the population size of garden snail.

Explain your answer.

Berdasarkan carta bar di **1**(*e*)(ii), *nyatakan hubungan di antara kawasan tangkapan dengan saiz populasi siput kebun.*

Terangkan jawapan anda.

.....

.....

.....

.....

[3 *marks*]
[3 *markah*]

1(*f*) 3

(*g*) Based on the result of this experiment, state the operational definition for the population size of garden snail.

Berdasarkan keputusan eksperimen ini, nyatakan definisi secara operasi bagi saiz populasi siput kebun.

.....

.....

.....

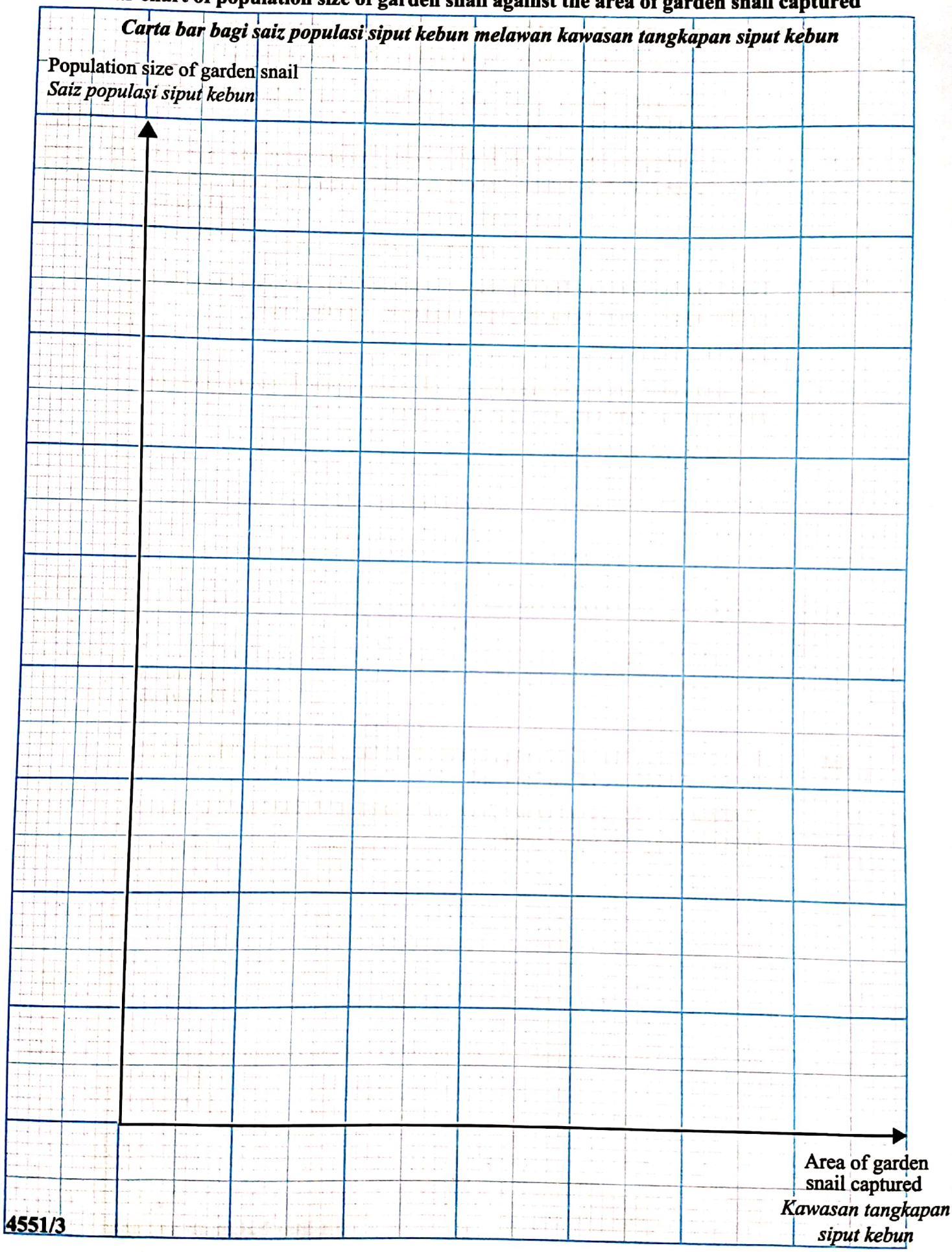
.....

[3 *marks*]
[3 *markah*]

1(*g*) 3

Bar chart of population size of garden snail against the area of garden snail captured

Carta bar bagi saiz populasi siput kebun melawan kawasan tangkapan siput kebun



For Examiner's Use

(*h*) Another group of ecologist carried out the same experiment at paddy field but snail garden were captured one week after harvest period.
Predict the population size of snail garden.
Explain your prediction.

Sekumpulan ahli ekologi yang lain menjalankan eksperimen yang sama di sawah padi tetapi siput kebun ditangkap seminggu selepas musim tuai.
Ramalkan saiz populasi siput kebun.
Terangkan ramalan anda.

.....

.....

.....

.....

[3 *marks*]
[3 *markah*]

1(*h*) 3

(*i*) The following list are factors of biotic and abiotic components to population size of garden snail.

Senarai berikut merupakan faktor komponen biotik dan abiotik ke atas saiz populasi siput kebun.

Classify the factors of biotic and abiotic components to population of garden snail in Table 3.
Kelaskan faktor komponen biotik dan abiotik ke atas saiz populasi siput kebun dalam Jadual 3.

Producer *Pengeluar*	Soil texture *Tekstur tanah*	Temperature *Suhu*
Parasite *Parasit*	Topography *Topografi*	Prey *Mangsa*

Biotic factor ***Faktor Biotik***	**Abiotic factor** ***Faktor Abiotik***

Table 3
Jadual 3

[3 *marks*]
[3 *markah*]

1(*i*) 3

Total 33

[Lihat halaman sebelah

2 *Lemna* sp. is a floating plant, which lives in fresh water environment. The growth of *Lemna* sp. depend on the abiotic factors such as light intensity, temperature, water pH value and concentration on carbon dioxide.

Lemna sp. *merupakan sejenis tumbuhan terapung, yang hidup dalam persekitaran air tawar. Pertumbuhan Lemna* sp. *bergantung kepada faktor-faktor abiotik seperti keamatan cahaya, suhu, nilai* pH *air dan kepekatan karbon dioksida.*

Diagram 2 shows the *Lemna* sp. in pond.

Rajah 2 *menunjukkan Lemna* sp. *di kolam.*

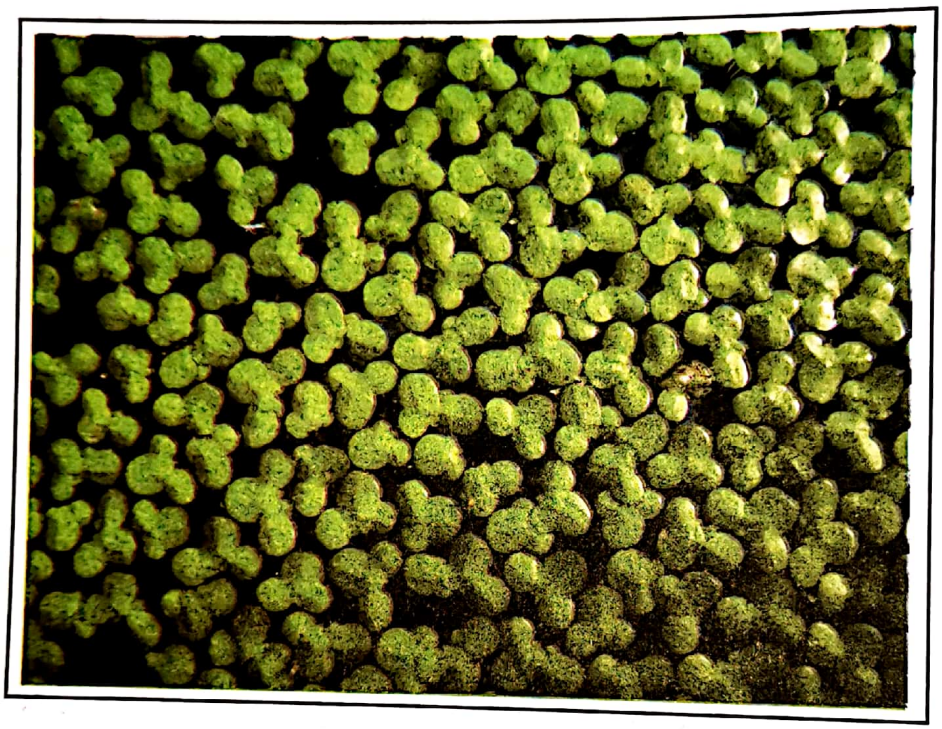


Diagram 2
Rajah 2

Based on the information and Diagram 2, design a laboratory experiment to investigate the effect of light intensity on the population growth rate of *Lemna* sp..

Berdasarkan maklumat dan Rajah 2, rangka satu eksperimen makmal untuk menyiasat kesan keamatan cahaya ke atas kadar pertumbuhan populasi Lemna sp..

The planning of your experiment must include the following aspects:

Perancangan eksperimen anda mesti merangkumi aspek-aspek berikut:

- Problem statement
  Pernyataan masalah
- Hypothesis
  Hipotesis
- Variables
  Pemboleh ubah
- List of apparatus and materials
  Senarai radas dan bahan
- Experimental procedure
  Prosedur eksperimen
- Presentation of data
  Persembahan data

[17 *marks*]
[17 *markah*]

END OF QUESTION PAPER
KERTAS PEPERIKSAAN TAMAT

★★

MODUL PINTAS 2020
TINGKATAN 5

4551/3

BIOLOGY
Kertas 3

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

Satu jam tiga puluh minit

PERATURAN PEMARKAHAN
BIOLOGY K3
4551/3

Question 1

<table>
<tr><th>No</th><th>Mark Scheme</th><th>Score</th></tr>
<tr><td colspan="3">KB0603 – Measuring Using Number</td></tr>
<tr><td rowspan="4">1 (a)</td><td>Able to record all 6 readings for the number of garden snail in the second captured and the number of garden snails marked in the second capture.

Sample answer:

<table>
<tr><th>Area for garden snail captured
Kawasan siput kebun ditangkap</th><th>Number of garden snail in the second capture / unit
Bilangan siput kebun dalam tangkapan kedua</th><th>Number of garden snail marked in the second capture / unit
Bilangan siput kebun yang bertanda dalam tangkapan kedua</th></tr>
<tr><td>Lakeside
Tepi tasik</td><td>11</td><td>7</td></tr>
<tr><td>Housing area
Kawasan perumahan</td><td>13</td><td>9</td></tr>
<tr><td>Paddy field
Sawah padi</td><td>15</td><td>12</td></tr>
</table>
</td><td>3</td></tr>
<tr><td>Able to list 5 - 3 readings correctly</td><td>2</td></tr>
<tr><td>Able to list 2 - 1 readings correctly</td><td>1</td></tr>
<tr><td>No response or incorrect response</td><td>0</td></tr>
</table>

KB0601 - Observation		
1 (b) (i)	Able to state two different observations based on the following criteria: [Observation must have values / type for MV and RV from Table 1 or comparison between two readings] MV: Area for garden snail capture *Kawasan siput kebun ditangkap* RV: Number of garden snail in second capture / Number of garden snail marked in the second captured *Bilangan siput kebun dalam tangkapan kedua / Bilangan siput kebun yang bertanda dalam tangkapan kedua* Sample answers: 1. If the garden snail caught from lakeslide, the number of garden snail marked in the second captured is 11 units and number of garden snail marked in the second captured is 7 units. *Jika siput kebun ditangkap daripada tepi tasik, bilangan siput kebun dalam tangkapan kedua ialah 11 dan bilangan siput kebun dalam tangkapan kedua yang bertanda ialah 7.* 2. If the garden snail caught from paddy field, the number of garden snail marked in the second captured is 15 units and number of garden snail marked in the second captured is 12 units. *Jika siput kebun ditangkap daripada sawah padi, bilangan siput kebun dalam tangkapan kedua ialah 15 dan bilangan siput kebun dalam tangkapan kedua yang bertanda ialah 12* *compulsory to take **both** reading Wajib memberi **kedua** bacaan	3
	Able to state one observation correctly and one-two inaccurate observations. Sample answers: 1. If the garden snail caught from lakeslide, the number of garden snail marked in the second captured higher // inversely. *Jika siput kebun ditangkap daripada tepi tasik, bilangan siput kebun ditangkap adalah lebih tinggi* 2. The number of garden snail captured in the second capture influenced by the area for garden snail captured / catchment area. *Bilangan siput kebun ditangkap dalam tangkapan kedua dipengaruhi oleh kawasan siput kebun ditangkap.*	2

	Able to state one correct observation Or Able to state two different observations at idea level. Sample answers: 1. The number of garden snail captured in the second capture // marked in second captured is different. *Bilangan siput kebun ditangkap dalam tangkapan kedua adalah berbeza*	1
	No response or wrong response	0

KB0604 - Making inference		
1(b)(ii)	Able to make two inferences correctly. <u>Note:</u> Inference must match observation. P1: Food source from catchment area // Temperature of catchment area // Humidity *Sumber makanan daripada kawasan tangkapan / Suhu kawasan tangkapan // Kelembapan* P2: Population size of garden snail. *Populasi saiz siput kebun* Sample answers: 1. More food source at paddy field // Low temperature // high humidity, more population size of garden snail. *Lebih banyak sumber makanan di sawah padi // suhu rendah // kelembapan tinggi, lebih besar saiz populasi.* 2. Less food source at lakeside, less population size of garden snail. *Kurang sumber makanan di tepi tasik // suhu tinggi, lebih kecil saiz populasi siput kebun.*	3
	Able to make one correct inferences and one inaccurate inference inaccurately. Sample answers: 1. More food source at paddy field. *Lebih makanan di persisiran sawah padi* 2. Less population of garden snail at lakeside. *Kurang populasi siput kebun di tepi tasik.*	2
	Able to state one correct inference and one-two inference at idea level. Sample answers: 1. Different population of garden snail. *Populasi siput kebun berbeza* 2. Population of garden snail depends on catchment area. *Populasi siput kebun bergantung kepada kawasan tangkapan.*	1
	No response OR wrong response	0

Scoring

Score	Correct	Inaccurate	Idea	Wrong
3	2	-	-	-
2	1	1	-	-
	-	2	-	-
1	1	-	1	-
	-	-	2	-
	-	1	1	-
	1	-	-	1
0	-	1	-	1
	-	-	1	1

KB0610 - Controlling variables

1(c) Able to state all 3 variables and the methods to handle the variable correctly. — 3

Sample answers:

Variables	Method to handle the variable correctly
<u>Manipulated variable:</u> Capture area for garden snail *Kawasan tangkapan siput kebun*	Use different area to catch garden snail from lakeside, housing area and paddy field *Menggunkan kawasan tangkapan siput kebun yng berbeza daripada kawasan tepi tasik, kawsan perumahan dan sawah padi*
<u>Responding variable:</u> 1. Number of garden snail in second captured // Number of marked garden snail in second captured *Bilangan dalam tangkapan pertama // Bilangan siput kebun yang bertanda dalam tangkapan pertama* 2. Population (size) of garden snail *Saiz populasi siput kebun*	Count and **record** the number of garden snail in second captured // number of marked garden snail in second captured *Mengira dan **merekod** bilangan siput kebun dalam tangkapan kedua // bilangan siput kebun yang bertanda dalam tangkapan kedua* **Calculate** population size of garden snail using **formula** = <u>No.of garden snail in the 1st capture X</u> <u>No.of garden snail in the 2nd capture</u> Number of marked garden snail in the second captured ***Mengira** saiz populasi siput kebun mengunakan **formula** =* <u>*Bil. siput kebun dlm tangkapan per1 X*</u> <u>*Bil. siput kebun dlm tangkapan ke2*</u> *Bilangan siput kebun yang bertanda dalam tangkapan kedua*

	<u>Constant variable</u> 1. Number of garden snail in the first captured. *Bilangan siput kebun dalam tangkapan pertama* 2. Type of snail. *Jenis siput* 3. Day for recaptured. *Hari untuk tangkap semula*	1. Same number of garden snail catch in the first captured is 25. *Bilangan siput kebun dalam tangkapan pertama ialah 25.* 2. Catch the same type of kura-kura. *Menangkap jenis siput yang sama iaitu siput kebun* 3. The garden snail is recaptured after seven days released. *Tangkap semula siput kebun selepas tujuh hari* 6 ticks	
	4 - 5 ticks		2
	1 - 3 ticks		1
	0 tick		0

KB0611 - Making hypothesis		
1 (d)	Able to state hypothesis following all criteria. P1: Manipulated variable (Catchment area) *Kawasan tangkapan* P2: Responding variable (Number of garden snail marked in second capture // Population size of garden snail) *Bilangan siput kebun yang bertanda dalam tangkapan kedua // Saiz populasi siput kebun* P3: Relationship Sample answers: 1. The number of garden snail marked in the second captured from paddy field is higher than lakeside and housing area / vice versa. *Bilangan siput kebun yang bertanda dalam tangkapan kedua daripada sawah padi adalah lebih tinggi berbanding tepi tasik dan kawasan perumahan / dan sebaliknya* 2. The population size of garden snail at the paddy field is higher than lakeside and housing area / vice versa. *Saiz populasi siput kebun di sawah padi adalah lebih tinggi berbanding tepi tasik dan kawasan perumahan / dan sebaliknya*	3
	Able to make a hypothesis relating the manipulated variable and the responding variable inaccurately. Sample answers: 1. Number of garden snail marked in the second capture depends on the catchment area. *Bilangan siput kebun yang bertanda dalam tangkapan kedua bergantung kepada kawasan tangkapan*	2
	Able to make a hypothesis at idea level. Sample answers: 1. Different area causes different garden snail *Kawasan yang berbeza menyebabkan siput kebun yang berbeza* 2. Area affects / influence number of garden snail *Kawasan mempengaruhi bilangan siput kebun*	1
	No response or incorrect response **P3** is not given if there is no **P1** or **P2**	0

<table>
<tr><th colspan="3">KB0606 – Communication</th></tr>
<tr><td>1 (e)(i)</td><td>Able to construct a table correctly based on the following aspects:

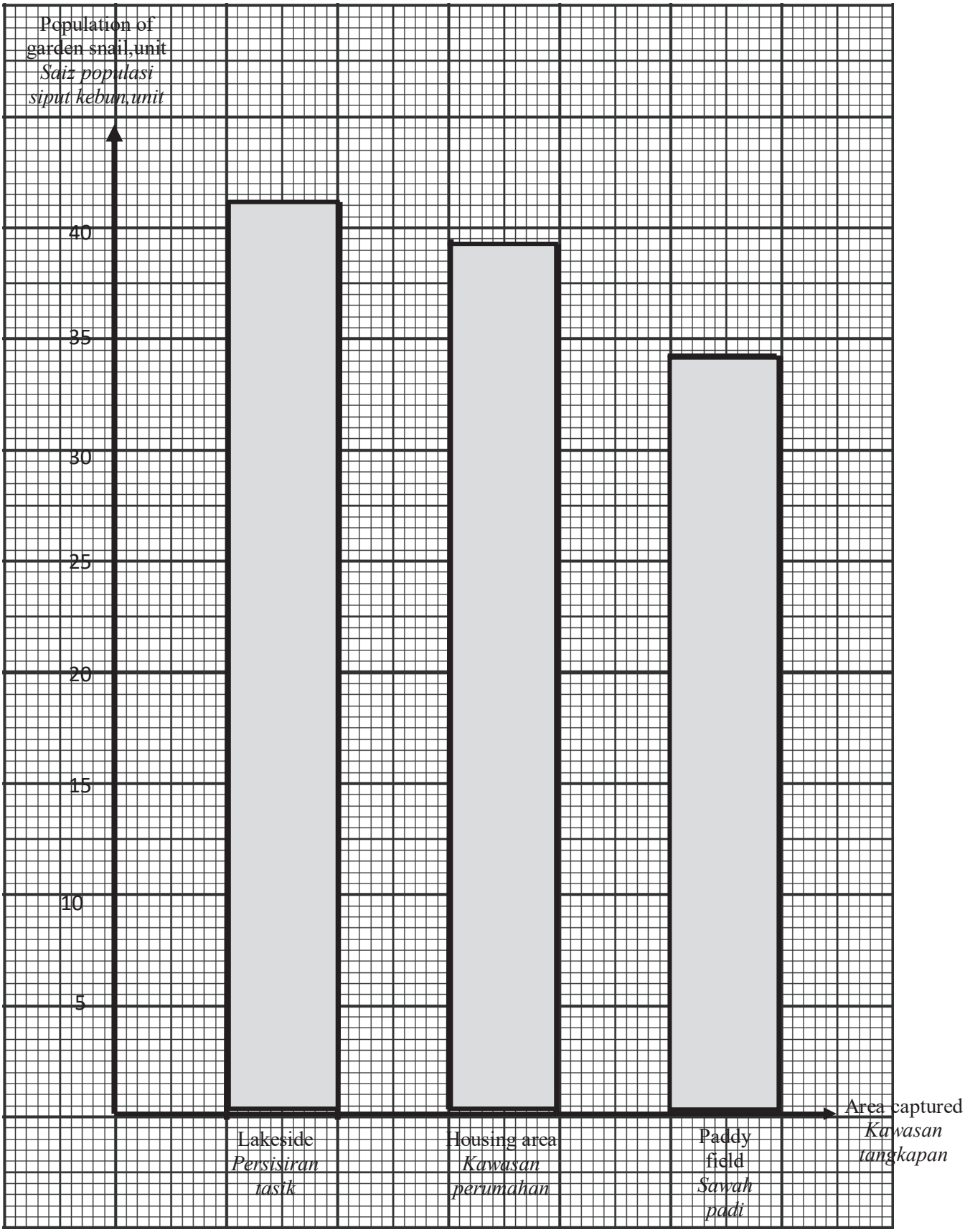
(T): The titles with units correctly.
(D): All the data
Number of garden snail in first, second and mark in the second captured.
Bilangan siput kebun dalam tangkapan pertama, kedua dan bertanda dalam
tangkapan kedua.
(C): Population size of the garden snail.
Saiz populasi siput kebun

Sample answer:

<table>
<tr><th>Catchment area of the garden snail
Kawasan tangkapan siput kebun</th><th>Number of garden snail in the first captured (unit)
Bilangan siput kebun dalam tangkapan pertama (unit)</th><th>Number of garden snail in the second capture (unit)
Bilangan siput kebun dalam tangkapan kedua (unit)</th><th>Number of marked garden snail in the second capture (unit)
Bilangan siput kebun yang bertanda dalam tangkapan kedua (unit)</th><th>Population size of garden snail (unit)
Saiz populasi siput kebun (unit)</th></tr>
<tr><td>Lakeside
Tepi tasik</td><td>27</td><td>11</td><td>7</td><td>42</td></tr>
<tr><td>Housing area
Kawasan perumahan</td><td>27</td><td>13</td><td>9</td><td>39</td></tr>
<tr><td>Paddy field
Sawah padi</td><td>27</td><td>15</td><td>12</td><td>34</td></tr>
</table>

REJECT (C) if reading in decimals.</td><td>3</td></tr>
<tr><td></td><td>Any two correct</td><td>2</td></tr>
<tr><td></td><td>Any one correct</td><td>1</td></tr>
<tr><td></td><td>No response or incorrect response.</td><td>0</td></tr>
</table>

KB0607 – Relationship between space and time		
1 (e)(ii)	Able to draw the bar chart correctly with the following criteria: Criteria: P (paksi) : Uniform scales on both axis, label bar. Y axis, Population size of garden snail X axis, Area captured T (titik) : All 3 points transferred correctly. B (bentuk) : Same size for the bars and bars are separated.	3
	Any two criteria correct	2
	Any one criteria correct	1
	No response or incorrect response	0


Population of garden snail,unit
Saiz populasi siput kebun,unit
40
35
30
25
20
15
10
5
Lakeside
Persisiran tasik
Housing area
Kawasan perumahan
Paddy field
Sawah padi
Area captured
Kawasan tangkapan

KB0608 – Interpreting data		
1 (f)	Able to explain the relationship between the catchment area and population size of garden snail based on the bar chart and the following aspects: R - able to state the relationship (<u>Population size</u> & area) E1 - amount of food sources E2 - temperature // humidity Sample answers: 1. The population size of garden snail at paddy field increase / higher than population size of garden snail at lakeside and housing area because more amount of food sources and low temperature // more / high humidity / wet area. *Saiz populasi siput kebun di sawah padi meningkat / lebih tinggi saiz populasi berbanding persisiran tepi tasik dan kawasan perumahan kerana lebih banyak sumber makanan dan suhu rendah // kelembapan tinggi.* **(1R + Any 2E)** **Note: If R1 wrong, reject E1 & E2**	3
	Able to interpret the relationship incompletely Sample answers: 1. The population of garden snail at paddy field <u>increase / higher than</u> population of garden snail at lakeside and housing area because more amount of food sources. *Populasi siput kebun di persisiran sawah padi meningkat / lebih tinggi berbanding populasi siput kebun di persisiran paya bakau dan tepi tasik kerana jumlah makanan banyak.* Two aspects including **<u>R1</u>** Example: R1 + E1 / R1 + E2 Note: Relationship at idea level is <u>not accepted</u>. e.g: The population of garden snail influenced by the catchment area BUT Explanation can be accepted.	2
	Able to interpret the relationship at idea level. Sample answer: 1. The population size of garden snail at paddy field <u>increase / higher than</u> population size of garden snail at lakeside and housing area. *Saiz populasi siput kebun di sawah padi meningkat / lebih tinggi berbanding saiz populasi di persisiran tepi tasik dan kawasan perumahan.* Only **<u>R1</u>** stated	1

KB0609 – Defining by operation		
1 (g)	Able to define operationally the population size of garden snail based on the result of this experiment. P1 : Number or garden snail in lakeside, housing area and paddy field P2 : Number of garden snail marked in second captured P3 : The population of garden snail depends on the catchment area // hypothesis statement Sample answer: Population size of garden snail is number of garden snail in lakeside, housing area and paddy field shown by the number of garden snail marked in second captured depends on the catchment area. *Saiz populasi siput kebun ialah bilangan siput kebun di tepi tasik, kawasan perumahan dan sawah padi ditunjukkan melalui bilangan siput kebun yang bertanda dalam tangkapan kedua dipengaruhi oleh kawasan tangkap*	3
	Any two correct	2
	Any one correct	1
	No response or incorrect response Theoretical explanation.	0
	No response or incorrect response or wrong relationship.	0

KB0605 - Predicting		
1(h)	Able to predict and explain the outcome of the experiment correctly with the following aspects: P : Population size of garden snail decrease / any suitable value less than 34 E1: Decrease food source/nutrition E2: High temperature Sample answer: 1. The population size of garden snail will decrease because less than 34 / decrease of food sources and high temperature after harvest time. *Saiz populasi siput kebun akan berkurang kerana sumber makanan berkurang dan suhu meningkat selepas musim menuai.* **Must Correct <u>Prediction</u>** **P + 2E's**	3
	P + Any 1 E	2
	P only	1
	No response or incorrect response	0

<table>
<tr><th colspan="3">KB0602 – Classifying</th></tr>
<tr><td>1 (i)</td><td>Able to classify all factors into two groups correctly in table:

<table><tr><th>Biotic factor
Faktor biotik</th><th>Abiotic factor
Faktor abiotik</th></tr><tr><td>Producer
Pengeluar

Prey
Mangsa

Parasite
Parasit</td><td>Humidity
Kelembapan

Temperature
Suhu

Soil texture
Struktur tanah</td></tr></table>6 ticks</td><td>3</td></tr>
<tr><td></td><td>3-5 ticks</td><td>2</td></tr>
<tr><td></td><td>1-2 ticks</td><td>1</td></tr>
<tr><td></td><td>0 tick</td><td>0</td></tr>
</table>

Question 2

KB061201 – (KB061203 – Statement of Identified Problem)		
No	**Mark Scheme**	**Score**
2(i)	Able to state the problem statement of the experiment correctly that include criteria: Manipulated variable : light intensity Responding variable : population growth rate of *Lemna sp.* Relationship in question form and question symbol [?] Sample answers: 1. Does the light intensity affect the population rate of *Lemna sp.* plants? *Adakah keamatan cahaya mempengaruhi kadar populasi tumbuhan Lemna sp.?* 2. What is the effect the light intensity on the population rate of *Lemna sp.* plants? *Apakah kesan keamatan cahaya ke atas kadar populasi tumbuhan Lemna sp.?*	3
	Able to state the problem statement of the experiment with **any 2** criteria Sample answer 1. Does the light intensity affect the population rate of plant? *Adakah keamatan cahaya mempengaruhi kadar populasi tumbuhan?* 1. What is the effect the light intensity on the population rate of *Lemna sp.* plants *Apakah kesan keamatan cahaya ke atas kadar populasi tumbuhan Lemna sp.*	2
	Able to state the problem statement of the experiment with **any 1** criteria Sample answer 1. What is the effect of light intensity on population? *Apakah kesan keamatan cahaya ke atas populasi?* 2. Does the light intensity affect the growth of plant *Adakah keamatan cahaya mempengaruhi pertumbuhan tumbuhan*	1

KB061202 (KB061203 – Making Hypothesis)		
No.	**Mark Scheme**	**Score**
2 (ii)	Able to state the hypothesis correctly based on **3** criteria: P1 : Manipulated variable (Light intensity) P2 : Responding variable (Population growth rate of *Lemna sp.*) P3 : Relationship of variable <u>Sample answers:</u> 1. The higher the light intensity, the higher the population growth rate of Lemna sp. *Semakin tinggi keamatan cahaya, semakin tinggi kadar pertumbuhan populasi Lemna sp.*	3
	Able to state the hypothesis correctly based on **2** criteria: <u>Sample answers:</u> 1. The population growth rate of Lemna sp. depends on light intensity. *Kadar populasi pertumbuhan bergantung kepada keamatan cahaya.*	2
	Able to state the hypothesis correctly based on **1** criteria: <u>Sample answers:</u> 1. The population growth rate of *Lemna sp*. is the highest in low light intensity. *Kadar pertumbuhan populasi Lemna sp. adalah paling pada keamatan cahaya yang rendah.*	1

(KB061203-Controlling variable)		
No.	**Mark Scheme**	**Score**
2 (iii)	Able to state all three variables correctly. Sample answers: 1. <u>Manipulated variable:</u> Light intensity *Keamatan cahaya* 2. <u>Responding variable:</u> Population growth rate of *Lemna sp.* *Kadar pertumbuhan populasi Lemna sp.* 3. <u>Controlled variable:</u> Species of plant (*Lemna sp.*), volume of water, concentration of nutrients, temperature, pH value, time *Spesis tumbuhan* (*Lemna sp.*), *isipadu air, kepekatan nutrisi, suhu, nilai pH, masa*	3
	Able to state any **two** variables correctly	2
	Able to state any **one** variables correctly	1
	No response <u>or</u> incorrect response	0

<table>
<tr><th colspan="3">KB061205 (KB061203 - Listing of Materials and Apparatus)</th></tr>
<tr><th>No.</th><th>Mark Scheme</th><th>Score</th></tr>
<tr><td>2 (iv)</td><td>Sample answers:

<table><tr><th>Apparatus</th><th>Materials</th></tr><tr><td>• Beakers // petri dish // container(√)
• Measuring cylinder (√)
• Meter (√)

(√) compulsory for 3A</td><td>• Lemna sp. (√)
• Distilled water (√)
• Culture // pond solution (√)

(√) compulsory for 3M</td></tr></table>3A + 3M</td><td>3</td></tr>
<tr><td></td><td>Able to list 2 materials and any 2 apparatus related to the experiment

2M + 2A</td><td>2</td></tr>
<tr><td></td><td>Able to list 1 materials and any 1 apparatus related to the experiment

1 M + 1A</td><td>1</td></tr>
<tr><td></td><td>Wrong response or no response</td><td>0</td></tr>
</table>

KB061204 (KB061203 - Method / procedure of investigation) - 3m			
No.	**Mark Scheme**	**Score**	
2 (v)	Notes: K1: Preparation of materials and apparatus (all 3) K2: Operating the constant variable (any 1) K3: Operating the responding variable (any 1) K4: Operating the manipulated variable (any 1) K5: Steps to increase reliability of results accurately / precaution (any 1) Able to describe all the 5'K' Sample answer: 1. Choose *Lemna sp.* plant of the same size *Pilih tumbuhan Lemna sp. pada saiz yang sama* 2. Choose // take three petri dishes at same size *Pilih tiga piring petri pada saiz yang sama.* 3. Label the petri dishes as A, B and C. *Label piring petri sebagai A, B dan C.* 4. Pour of 5 ml distilled water into petri dish A B and C *Tuangkan 5ml air suling ke dalam piring petri A, B dan C.* 5. Test the pH value of each solution using pH paper *Uji nilai pH stiap larutan dengan menggunakan kertas pH.* 6. Pour of 5 ml of culture solution / pond water into each petri dish. *Tuangkan 5 ml larutan kultur / air kolam ke dalam setiap piring petri.* 7. Put 5 *Lemna sp*. plants into each of the petri dish *Letak 5 tumbuhan Lemna sp. ke dalam setiap piring petri.* 8. Record in the table *Rekodkan di dalam jadual.* 9. Place petri dish A near the window in the laboratory, petri dish B inside the cupboard and petri dish C on the teacher table. *Letakkan piring petri A di tepi tingkap di dalam makmal, piring petri B di dalam almari dan piring petri C di atas meja guru.* 10. Change the solution in the petri dishes everyday. *Tukar larutan di dalam piring petri setiap hari.* 11. Count the number of Lemna sp. plants after 5 days. *Kira bilangan tumbuhan Lemna sp. selepas 5 hari.*	K1, K2 K1 K1 K1/K2 K1/K5 K1/K2 K1/K2 K1 K1, K3 K5 K2/K4	3

	12. Calculate the population growth rate of *Lemna sp*. plant using the formula; $\frac{\text{Number of } Lemna\ sp.plants}{5 \text{ days}}$ *Mengira kadar pertumbuhan populasi tumbuhan Lemna sp.dengan menggunakan formula;* $\frac{\textit{Bilangan tumbuhan Lemna sp.}}{\textit{5 hari}}$ 13. All the data is recorded in the table / tabulate data. *Semua data direkodkan di dalam jadual.* 14. The experiment is repeated twice to get the average reading. *Eksperimen diulang dua kali untuk mendapatkan bacaan purata*	K4 K1 K5	
	Any 3-4 'K'		2
	Any 1-2 'K'		1
	No response or incorrect response		0

<table>
<tr><th colspan="3">KB061203 – Planning Investigation (KB061203 - Data Presentation) - 2m</th></tr>
<tr><th>No.</th><th>Mark Scheme</th><th>Score</th></tr>
<tr><td>2 (vi)</td><td>Sample answer:

<table>
<tr><td rowspan="2">Light intensity
Keamatan cahaya</td><td colspan="2">Number of Lemna sp. plant (unit)
Bilangan tumbuhan Lemna sp. (unit)</td><td rowspan="2">The population growth rate of Lemna sp.(unit/day)
Kadar pertumbuhan populasi tumbuhan Lemna sp. (unit/hari)</td></tr>
<tr><td>Day 1</td><td>Day 5</td></tr>
<tr><td>Near window
Sebelah tingkap</td><td></td><td></td><td></td></tr>
<tr><td>Inside the cupboard
Di dalam almari</td><td></td><td></td><td></td></tr>
<tr><td>On the teacher table
Di atas meja guru</td><td></td><td></td><td></td></tr>
</table></td><td>2</td></tr>
<tr><td></td><td>Able to construct a table to record data based on one aspect only</td><td>1</td></tr>
<tr><td></td><td>No response or incorrect response</td><td>0</td></tr>
</table>

END OF MARKING SHEME
PERATURAN PEMARKAHAN TAMAT