SULIT

4551/1

4551/1
Biology
Paper 1
September
2011
1 ¼ hours

YAYASAN PERAK

JABATAN PELAJARAN NEGERI PERAK

PEPERIKSAAN PERCUBAAN SIJIL PELAJARAN MALAYSIA NEGERI PERAK 2011

BIOLOGY

PAPER 1

Satu jam lima belas minit

DO NOT OPEN THE QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO
JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

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

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

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

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

Kertas soalan ini mengandungi 25 halaman bercetak dan 3 halaman tidak bercetak.

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

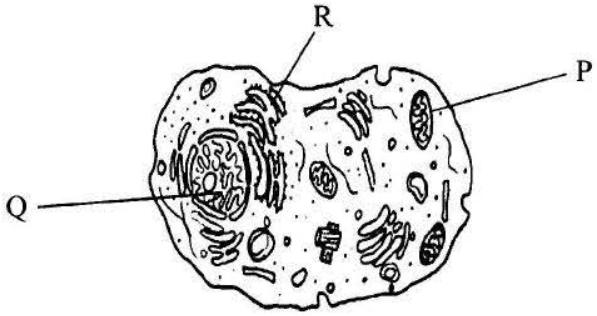

Diagram 1/ *Rajah 1*

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

	P	Q	R
A	Chloroplast *Kloroplas*	Nucleus *Nukleus*	Rough endoplasmic reticulum *Jalinan endoplasma kasar*
B	Nucleus *Nukleus*	Rough endoplasmic reticulum *Jalinan endoplasma kasar*	Mitochondrion *Mitokondrion*
C	Rough endoplasmic reticulum *Jalinan endoplasma kasar*	Mitochondrion *Mitokondrion*	Nucleus *Nukleus*
D	Mitochondrion *Mitokondrion*	Nucleus *Nukleus*	Rough endoplasmic reticulum *Jalinan endoplasma kasar*

2. Which organelle is responsible for modifying proteins to extracellular enzymes?
Organel manakah yang bertanggungjawab mengubahsuaikan protein kepada enzim luar sel?

A Mitochondrion
Mitokondrion
B Rough Endoplasmic Reticulum
Jalinan endoplasma kasar
C Golgi apparatus
Jasad Golgi
D Smooth endoplasmic reticulum
Jalinan endoplasma licin

3.

Cell → Tissue → P → System → Organism
Sel → Tisu → P → Sistem → Organisma

A group of tissues with specific function forms P.
Which of the following can be represented by P?
Sekumpulan tisu yang mempunyai tugas yang khusus membentuk P.
Manakah antara berikut diwakili oleh P?

A Tendon
Tendon
B Heart
Jantung
C Blood
Darah
D Neurone
Neuron

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4. Diagram 2 shows the movement of sucrose molecules in the water.
Rajah 2 menunjukkan pergerakan molekul sukrosa dalam air.

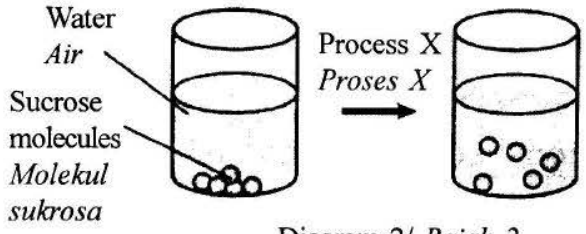

Diagram 2/ *Rajah 2*

What is process X?
Apakah proses X?

A Active transport
Pengangkutan aktif
B Osmosis
Osmosis
C Simple diffusion
Resapan ringkas
D Facilitated diffusion
Resapan berbantu

5. Which of the following does **not** involved active transport?
*Antara berikut, yang manakah **tidak** melibatkan pengangkutan aktif?*

A Absorption of potassium ions by animal cells
Penyerapan ion kalium oleh sel haiwan
B Uptake of mineral salts and ions by root hairs
Pengambilan garam mineral dan ion oleh rerambut akar
C Absorption of oxygen from the water by fish gills
Penyerapan oksigen dari air oleh insang ikan
D Accumulation of iodide ions by algae
Pengumpulan ion iodida oleh alga

6. Diagram 3 shows the set-up of an experiment.
Rajah 3 menunjukkan satu persediaan experiment.

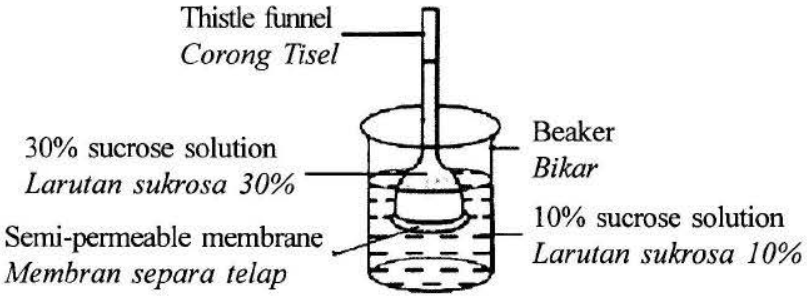

Diagram 3/ *Rajah 3*

What will be the observation of the experiment?
Apakah yang akan diperhatikan dalam eksperimen ini?

A The level of sucrose solution in the thistle funnel decreases.
Paras larutan sukrosa dalam corong tisel berkurangan.
B The level of sucrose solution in the thistle funnel increases.
Paras larutan sukrosa dalam corong tisel bertambah.
C The sucrose solution in the thistle funnel empties into the beaker.
Larutan sukrosa dalam corong tisel dikosongkan ke dalam bikar.
D The level of sucrose solution in the thistle funnel remains unchanged.
Paras larutan sukrosa dalam corong tisel kekal tidak berubah.

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7. Which of the following represents the hydrolysis of polypeptides?
Antara yang berikut, yang manakah mewakili hidrolisis polipeptida?

A Polypeptides → water + dipeptides
Polipeptida → air + dipeptida
B Dipeptides → water + polypeptides
Dipeptida → air + polipeptida
C Dipeptides + water → polypeptides
Dipeptida + air → polipeptida
D Polypeptides + water → dipeptides
Polipeptida + air → dipeptida

8. Which of the following are extracellular enzymes?
Antara berikut, yang manakah merupakah enzim luar sel?

I Amylase / *Amilase*
II Pepsin / *Pepsin*
III Trypsin / *Tripsin*

A I and II
I dan II
B I and III
I dan III
C II and III
II dan III
D I, II and III
I, II dan III

9. Diagram 4 shows the action of an enzyme on a substrate molecule.
Rajah 4 menunjukkan tindakan satu enzim ke atas satu molekul substrat.

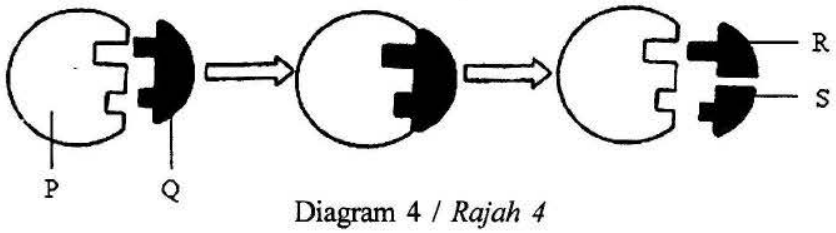

Diagram 4 / *Rajah 4*

What is S if P is lactase, Q is lactose and R is glucose?
Apakah S jika P ialah laktase, Q ialah laktosa dan R ialah glukosa?

A Maltose
Maltosa
B Glucose
Glukosa
C Fructose
Fruktosa
D Galactose
Galaktosa

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10. The product of mitosis is two daughter cells, which are identical to the parent cell. Which of the following statements explain the behaviour of chromosomes in producing the two identical daughter cells?
Hasil mitosis ialah dua sel anak yang seiras dengan sel induk. Antara pernyataan berikut, yang manakah paling tepat menerangkan tentang perlakuan kromosom dalam penghasilan dua sel anak yang seiras?

A Pairing of the chromosomes at the equator of the cell.
Kromosom berpasangan di satah khatulistiwa sel.
B Spindle fibres pull the chromosome to the opposite poles of the cell.
Gentian gelendong menarik kromosom ke kutub bertentangan dalam sel.
C One chromatid from each chromosome moves to the opposite poles of the cell.
Satu kromatid dari setiap kromosom bergerak ke kutub bertentangan dalam sel.
D Replication of the chromosomes take place before pairing.
Kromosom bereplikasi sebelum berpasangan.

11. Diagram 5 shows a stage during cell division.
Rajah 5 menunjukkan satu peringkat dalam pembahagian sel.

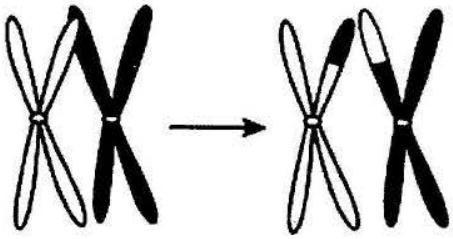

Diagram 5 / *Rajah 5*

Which part of a plant does this process take place?
Bahagian tumbuhan yang manakah merupakan tempat berlakunya peringkat ini?

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

12. Which of the following cells does **not** contain genetic materials?
*Antara sel-sel berikut, yang manakah **tidak** mengandungi bahan genetik?*

A Red blood cell
Sel darah merah
B White blood cell
Sel darah putih
C Cheek cell
Sel pipi
D Muscle cell
Sel otot

13. Which of the following food classes does **not** provide energy to our body?
*Antara kelas makanan berikut, yang manakah **tidak** membekalkan tenaga kepada badan kita?*

A Lipid
Lipid
B Protein
Protein
C Mineral
Mineral
D Carbohydrate
Karbohidrat

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14. Table 1 shows the volume of fruit juices required to decolourise 1 cm^3 of 0.1% DCPIP solution.
Jadual 1 menunjukkan isipadu jus buah-buahan yang diperlukan untuk melunturkan warna 1 cm^3 larutan DCPIP 0.1%.

Fruit juice *Jus buah-buahan*	Volume required *Isipadu yang diperlukan*
A	1.0 cm^3
B	1.6 cm^3
C	0.7 cm^3
D	2.5 cm^3

Table 1 / *Jadual 1*

Which of the following fruit juices **A, B, C** or **D** has the highest vitamin C content?
*Antara jus buah-buahan **A, B, C** dan **D**, yang manakah mempunyai kandungan vitamin C yang paling tinggi?*

15. Faeces which are not quickly expelled from the body will harden in the rectum because
Tinja yang tidak disingkirkan daripada badan dengan segera akan menjadi keras dalam rektum kerana

A the rectum absorbs water from the faeces.
rektum menyerap air daripada tinja.
B the rectum dries up the mucus that lubricates the movement of faeces.
rektum mengeringkan mukus yang melicinkan pergerakan tinja.
C the rectum removes some of the digestible materials from the faeces.
rektum menyingkirkan sesetengah bahan tercerna daripada tinja.
D the rectum removes some of the indigestible materials from the faeces.
rektum menyingkirkan sesetengah bahan tidak tercerna daripada tinja.

16. Diagram 6 shows a typical strucfure of a chloroplast.
Rajah 6 menunjukkan struktur tipikal kloroplas.

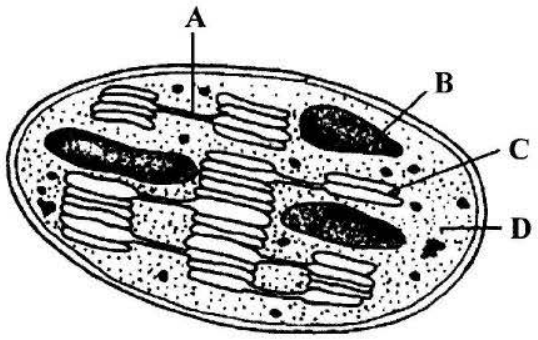

Diagram 6 / *Rajah 6*

Which of the parts labelled **A, B, C** or **D** is the site for dark reaction during photosynthesis?
*Antara bahagian berlabel **A, B, C** dan **D**, yang manakah merupakan tapak bagi tindak balas gelap semasa fotosintesis?*

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17. Which of the following takes place during vigorous activity carried out by an athlete?
Antara berikut, yang manakah berlaku semasa seorang ahli sukan menjalankan aktiviti cergas?

A Lactic acid is produced.
Asid laktik dihasilkan.

B Ethanol is produced.
Etanol dihasilkan.

C Glucose is produced.
Glukosa dihasilkan.

D Carbon dioxide is used.
Karbon dioksida digunakan.

18. Diagram 7 shows the structure of a human alveolus.
Rajah 7 menunjukkan struktur satu alveolus manusia.

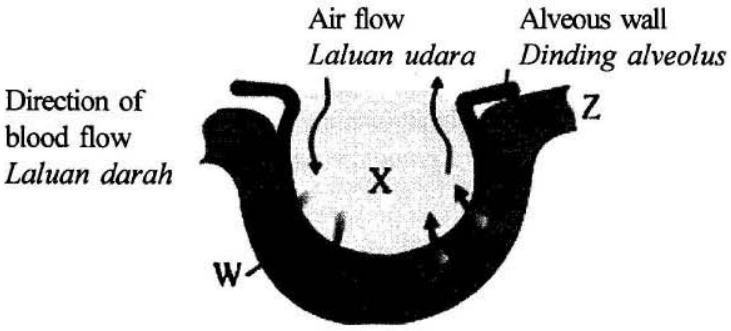

Diagram 7 / *Rajah 7*

Which of the following is **not true** about the structure above?
*Antara yang berikut, manakah **tidak benar** mengenai struktur di atas?*

A The partial pressure of oxygen is higher in X compared to the partial pressure of oxygen in W
Tekanan separa oksigen lebih tinggi dalam X berbanding dengan tekanan separa oksigen dalam W

B The blood capillaries will transport the carbon dioxide from X to W
Kapilari darah akan mengangkut karbon dioksida dari X ke W

C Both X and Z have high partial pressure of oxygen.
Kedua-dua X dan Z mempunyai tekanan separa oksigen yang tinggi

D W has a higher partial pressure of carbon dioxide compared to Z.
W mempunyai tekanan separa karbon dioksida yang lebih tinggi berbanding dengan Z

19. Which of the following structure increases the efficiency of the fish's gills as a respiratory organ?
Antara struktur yang berikut, yang manakah menambahkan kecekapan insang ikan sebagai organ respirasi?

A Blood capillary
Kapilari darah

B Filament
Filamen

C Lamellae
Lamella

D Gill arch
Lengkung Insang

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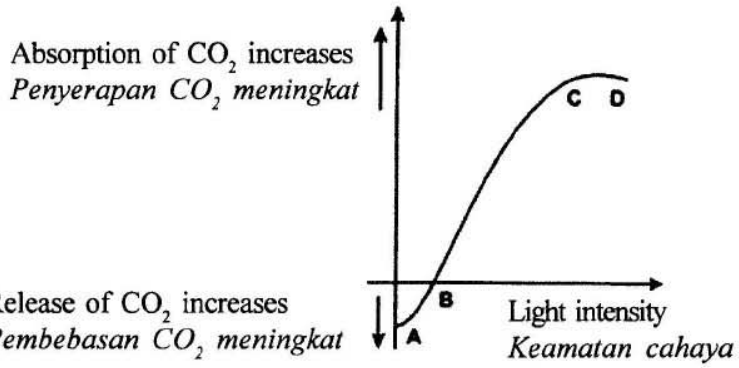
20. Graph below shows the amount of carbon dioxide taken in and produced by a plant at different light intensities. Which of the following points **A, B, C** or **D** is the compensation point?
*Graf di bawah menunjukkan kandungan karbon dioksida yang diambil dan dihasilkan oleh tumbuhan pada keamatan cahaya yang berlainan. Antara titik **A, B, C** dan **D**, yang manakah merupakan titik pampasan?*



21. Lichens consist of fungi and green algae. The green algae produces food for itself and for the fungi. The fungi supplies carbon dioxide and nitrogenous compounds for the algae. What type of the relationship between these two organisms?
Kulampair terdiri daripada fungi dan alga hijau. Alga hijau membekalkan makanan kepada dirinya sendiri dan fungi. Fungi akan membekalkan karbon dioksida dan sebatian-sebatian bernitrogen untuk alga. Apakah jenis hubungan antara kedua-dua organisma ini?

A Mutualism
Mutualisme
B Saprophytism
Saprofitisme
C Parasitism
Parasitisme
D Commensalism
Komensalisme

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22. Table 2 shows the results of a study on the population of garden snails in a garden.
Jadual 2 menunjukkan keputusan satu kajian ke atas populasi siput di sebuah taman.

	Number of snails *Bilangan siput*	
	First capture *Tangkapan pertama*	Second capture (after one day) *Tangkapan kedua (selepas satu hari)*
Marked *Bertanda*	100	40
Unmarked *Tidak bertanda*	-	80

Table 2 / *Jadual 2*

Which of the following statements are correct?
Antara pernyataan- pernyataan berikut, yang manakah betul?

I The estimated population size of the garden snail is 200.
Anggaran saiz populasi siput ialah 200.

II The results are more accurate if the number of garden snails in the first capture is less than 100.
Keputusan kajian menjadi lebih tepat jika jumlah siput dalam tangkapan pertama kurang daripada 100.

III The results are more accurate if the number of garden snails in the second capture is more than 120.
Keputusan kajian menjadi lebih tepat jika jumlah siput dalam tangkapan kedua melebihi 120.

IV The results are more accurate if the second capture is done after one week.
Keputusan kajian menjadi lebih tepat jika tangkapan kedua dilakukan selepas satu minggu.

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

23. Which is the correct sequence in the process of plant succession in a mangrove swamp?
Susunan manakah yang betul dalam proses sesaran tumbuhan di hutan paya bakau?

A *Sonneratia sp.* → *Rhizophora sp.* → *Bruguiera sp.*
B *Sonneratia sp.* → *Bruguiera sp.* → *Rhizophora sp.*
C *Rhizophora sp.* → *Bruguiera sp.* → *Sonneratia sp.*
D *Bruguiera sp.* → *Rhizophora sp.* → *Sonneratia sp.*

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24 The following information refers to a kingdom in the classification of organisms.
Maklumat di bawah merujuk kepada satu alam dalam pengelasan organisma.

- Unicellular organisms
  Organisma unisel
- Have a cell wall
  Mempunyai dinding sel
- No membrane-bound organelles
  Organel tidak diselaputi membran
- The genetic material is scattered in the cytoplasm
  Bahan-bahan genetik tersebar di dalam sitoplasma

This organism belong to which kingdom?
Apakah alam bagi organisma ini?

A Monera
Monera

B Fungi
Fungi

C Protista
Protista

D Plantae
Plantae

25. Diagram 8 shows three types of air pollutants and their effects on the environment.
X, Y and Z are air pollutants.
Greenhouse effect, acid rain and ozone depletion are caused by X, Y and Z.
Rajah 8 menunjukkan tiga jenis bahan pencemar udara dan kesan terhadap persekitaran.
X, Y dan Z adalah bahan pencemar udara.
Kesan rumah hijau, hujan asid dan penipisan ozon disebabkan oleh X, Y dan Z

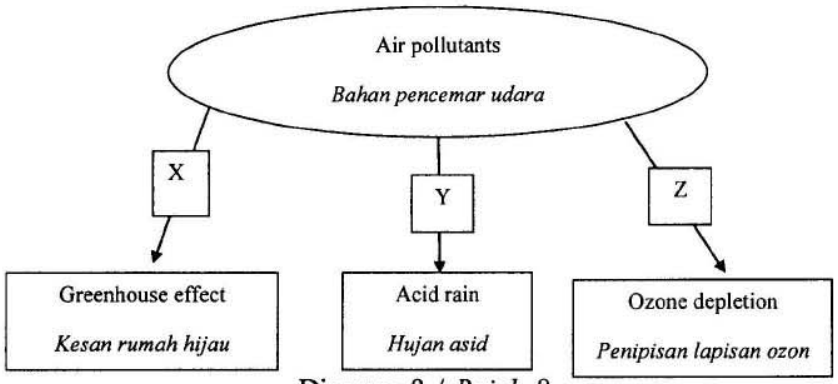

Diagram 8 / *Rajah 8*

What are X, Y and Z?
Apakah X, Y dan Z?

	X	Y	Z
A	Carbon dioxide *Karbon dioksida*	Sulphur dioxide *Sulfur dioksida*	Chlorine *klorin*
B	Carbon dioxide *Karbon dioksida*	Sulphur dioxide *Sulfur dioksida*	CFC *CFC*
C	Sulphur dioxide *Sulfur dioksida*	Hydrogen sulphide *Hidrogen sulfida*	CFC *CFC*
D	CFC *CFC*	Sulphur dioxide *Sulfur dioksida*	Carbon dioxide *Karbon dioksida*

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26 The following steps are carried out to reduce damage to the environment.
Langkah-langkah berikut dijalankan untuk mengurangkan kerosakan terhadap persekitaran.

I Replanting of trees
Penanaman semula pokok
II Car pooling
Berkongsi kereta
III Reducing the use of fossil fuels
Mengurangkan penggunaan bahan api fosil
IV Reducing the discharge of industrial solid waste
Mengurangkan pembuangan sisa pepejal industri

Which of the following steps help to reduce the effects of global warming?
Antara langkah-langkah berikut, yang manakah membantu mengurangkan kesan pemanasan global?

A I, II and III
I, II dan III
B I, II and IV
I, II dan IV
C I, III and IV
I, III dan IV
D II, III and IV
II, III dan IV

27 Which statements about B.O.D are true?
Pernyataan manakah mengenai B.O.D betul?

P : B.O.D is the quantity of oxygen produced by photosynthetic microorganisms
P : B.O.D ialah kuantiti oksigen yang dihasilkan oleh mikroorganisma yang berfotosintesis.
Q : The B.O.D value is an indicator of water quality.
Q : Nilai B.O.D ialah penunjuk kualiti air
R : A low B.O.D value shows that the concentration of dissolved oxygen in the water is high
R : Nilai B.O.D yang rendah menunjukkan kepekatan oksigen terlarut dalam air adalah tinggi.
S : A low B.O.D value shows that the population of decomposers is high.
S : Nilai B.O.D yang rendah menunjukkan populasi pengurai adalah tinggi

A P and Q
P dan Q
B Q and R
Q dan R
C R and S
R dan S
D Q, R and S
Q, R dan S

28

- Life span is 120 days
  Jangka hayat ialah 120 hari
- Biconcave disc shape
  Dwicekung
- Does not have nucleus
  Tidak mempunyai nucleus

Which of the following cell has the above characteristics?
Antara sel berikut yang manakah mempunyai ciri-ciri di atas?

A Red blood cell
Sel darah merah
B White blood cell
Sel darah putih
C Platelet
Platlet
D Lymphocyte
Limfosit

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29. Diagram 9 shows the cross section of a human heart.
Rajah 9 menunjukkan keratan rentas jantung manusia.

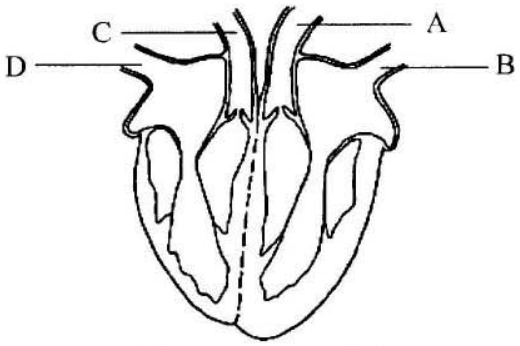

Diagram 9 / *Rajah 9*

Which of the following structure labelled **A, B, C** and **D** carries oxygenated blood to all body cells
*Antara struktur berlabel **A, B, C** dan **D**, yang manakah membawa darah beroksigen ke seluruh sel badan?*

30. Diagram 10 shows the mechanism of blood clotting.
Rajah 10 menunjukkan mekanisma pembekuan darah.

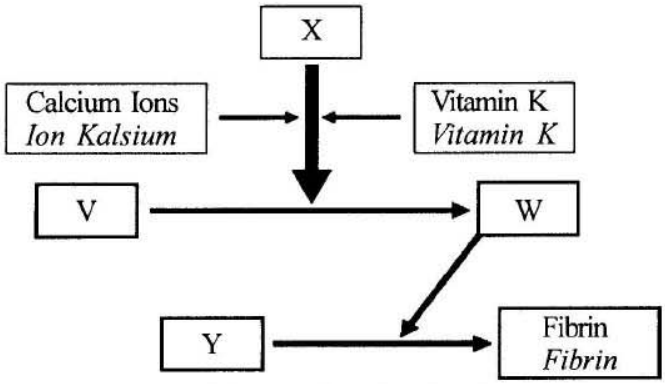

Diagram 10 / *Rajah 10*

What are **V, W, X** and **Y**?
*Apakah **V, W, X** dan **Y**?*

	V	W	X	Y
A	Thromboplastins *Tromboplastin*	Fibrinogen *Fibrinogen*	Thrombin *Trombin*	Prothrombin *Protrombin*
B	Prothrombin *Protrombin*	Thromboplastins *Tromboplastin*	Thrombin *Trombin*	Fibrinogen *Fibrinogen*
C	Thrombin *Trombin*	Thromboplastins *Tromboplastin*	Prothrombin *Protrombin*	Fibrinogen *Fibrinogen*
D	Prothrombin *Protrombin*	Thrombin *Trombin*	Thromboplastins *Tromboplastin*	Fibrinogen *Fibrinogen*

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31. Diagram 11 shows a part of the lymphatic system.
Rajah 11 menunjukkan sebahagian daripada sistem limfa.

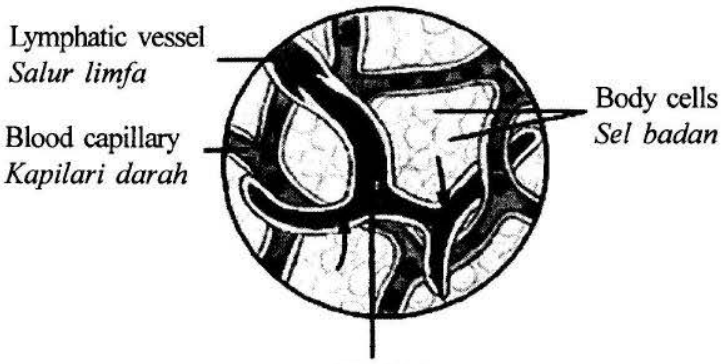

Diagram 11 / *Rajah 11*

Which of the following is **not** found in fluid X?
*Antara bahan berikut, yang manakah **tidak** terkandung dalam bendalir X?*

A Erythrocytes
Eritrosit
B Lipid
Lipid
C Lymphocytes
Limfosit
D Vitamin K
Vitamin K

32. Diagram 12 shows a leucocyte carrying out process X.
Rajah 12 menunjukkan leukosit yang sedang menjalankan proses X.

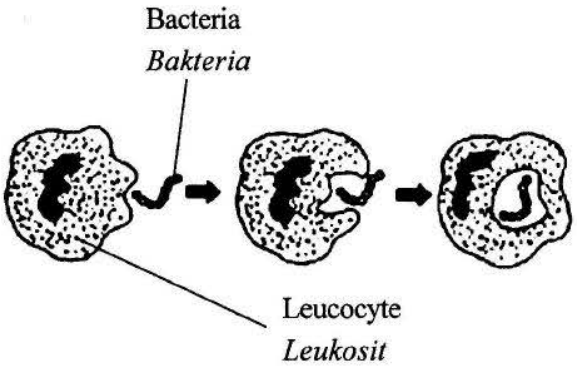

Diagram 12 / *Rajah 12*

What is process X?
Apakah proses X?

A Haemolysis
Hemolisis
B Neutralisation
Peneutralan
C Agglutination
Pengaglutinan
D Phagocytosis
Fagositosis

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33. Diagram 13 shows the concentration of antibody in the blood of a person who has been given two injections of an antiserum.
Rajah 13 menunjukkan kepekatan antibodi dalam darah seseorang yang telah diberi dua suntikan antiserum.

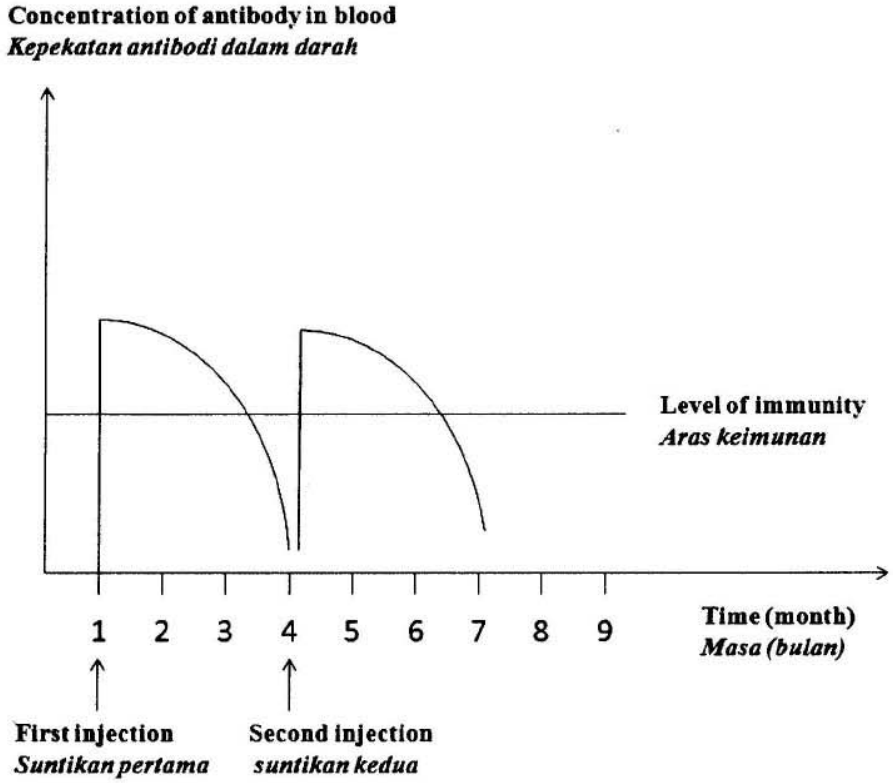

Diagram 13 / *Rajah 13*

What type of immunity is obtained by the person?
Apakah jenis keimunan yang diterima oleh individu tersebut?

A Naturally acquired active immunity
Keimunan aktif semulajadi
B Artificially acquired active immunity
Keimunan aktif buatan
C Naturally acquired passive immunity
Keimunan pasif semulajadi
D Artificially acquired passive immunity
Keimunan pasif buatan

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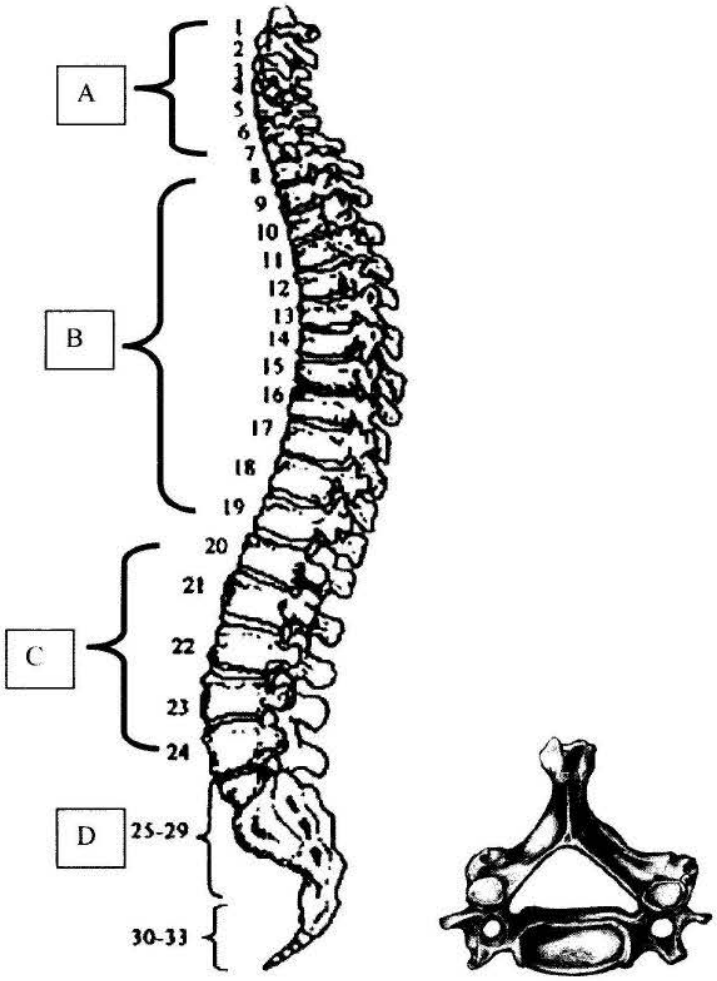
34. Diagram 14 shows a human vertebral column and vertebra Q.
Rajah 14 menunjukkan turus tulang belakang manusia dan vertebra Q.



Human vertebral column **Vertebra Q**

Diagram 14 / *Rajah 14*

Which of the part labelled **A, B, C** or **D** is the correct position for vertebra Q?
*Antara bahagian yang berlabel **A, B, C** atau **D**, yang manakah merupakan kedudukan yang betul bagi vertebra Q?*

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35. Terrestrial and aquatic plants need support to overcome the problem of gravitational pull. Which of the following is **not** correctly matched?
*Tumbuhan daratan dan akuatik memerlukan sokongan untuk mengatasi masalah tarikan graviti. Antara padanan berikut, yang manakah **tidak betul**?*

	Type of plants *Jenis-jenis tumbuhan*	Type of support *Jenis sokongan*
A	Submerged plant *Tumbuhan tenggelam*	Air sacs and water buoyancy *Pundi udara dan daya keapungan air*
B	Floating plants *Tumbuhan terapung*	Aerenchyma tissues and water buoyancy *Tisu arenkima dan daya keapungan air*
C	Woody plants *Tumbuhan berkayu*	Xylem and parenchyma tissues *Tisu xylem dan tisu parenkima*
D	Herbaceous plants *Tumbuhan renek*	Turgor pressure and collenchyma tissues. *Tekanan segah dan tisu kolenkima*

36. Diagram 15 shows the pectoral girdle and the upper limb.
Rajah 15 menunjukkan lengkungan pektoral dan bahagian anggota atas.

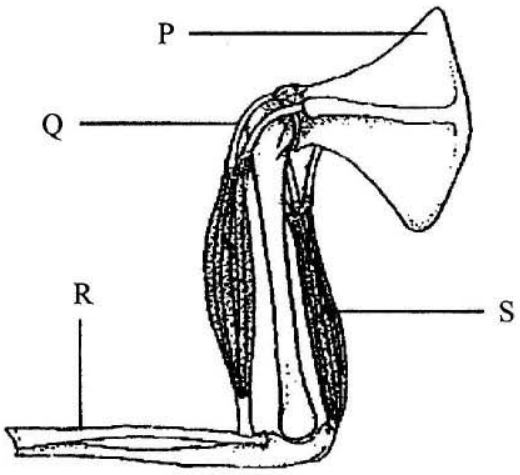

Diagram 15 / *Rajah 15*

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

	P	Q	R	S
A	Humerus *Humerus*	Ligament *Ligamen*	Radius *Radius*	Biceps *Bisep*
B	Scapula *Skapula*	Tendon *Tendon*	Ulna *Ulna*	Triceps *Trisep*
C	Humerus *Humerus*	Ligament *Ligamen*	Ulna *Ulna*	Biceps *Bisep*
D	Scapula *Skapula*	Tendon *Tendon*	Radius *Radius*	Triceps *Trisep*

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37. Diagram 16 shows an efferent neurone.
Which of the structure labelled **A, B, C** and **D** transmits the impulse to the muscle cell?
Rajah 16 merupakan suatu neuron eferen.
*Antara struktur berlabel **A, B, C** dan **D**, yang manakah memancarkan impuls ke sel otot?*

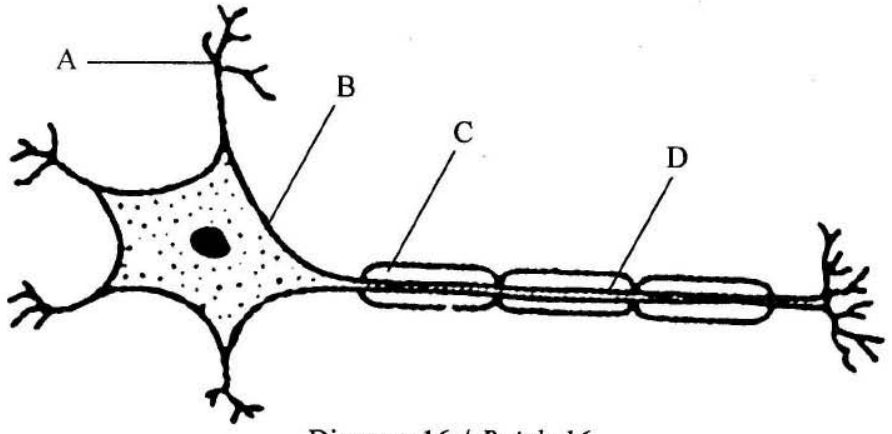

Diagram 16 / *Rajah 16*

38. Which of the following processes are controlled by medulla oblongata?
Antara proses-proses berikut, yang manakah dikawal oleh medulla oblongata?

I Peristalsis
Peristalsis
II Heart Beat
Degupan jantung
III Breathing process
Process penafasan
IV Urine formation
Pembentukan air kencing

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

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39. Diagram 17 shows a nephron. P1, P2, P3 and P4 are parts found on the nephron. K, L, M and N are processes that occur in the nephron.
Rajah 17 menunjukkan nefron. P1, P2, P3 dan P4 merupakan bahagian yang terdapat pada nefron. K, L, M dan N merupakan proses yang berlaku di dalam nefron.

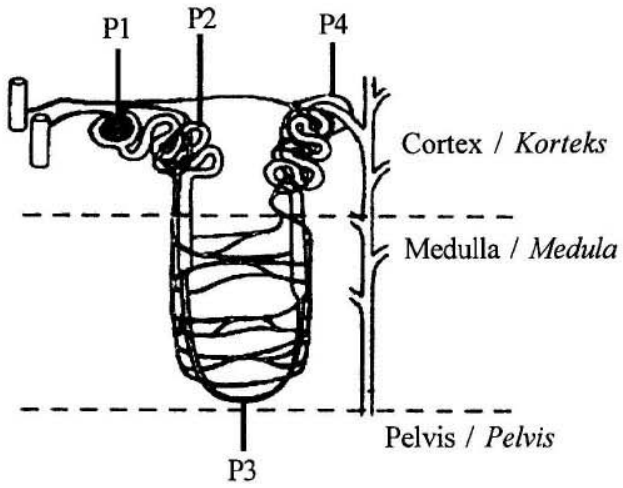

Diagram 17 / *Rajah 17*

K : The absorption of sodium chloride
Penyerapan natrium klorida.
L : Utrafitration
Penurasan ultra
M : The absorption of glucose
Penyerapan glukosa
N : Secretion of urea
Rembesan urea

Which processes occur at P1, P2, P3 and P4?
Apakah proses yang berlaku pada P1, P2, P3 and P4?

	P1	P2	P3	P4
A	L	K	M	N
B	L	M	K	N
C	M	N	K	L
D	N	L	M	K

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40.

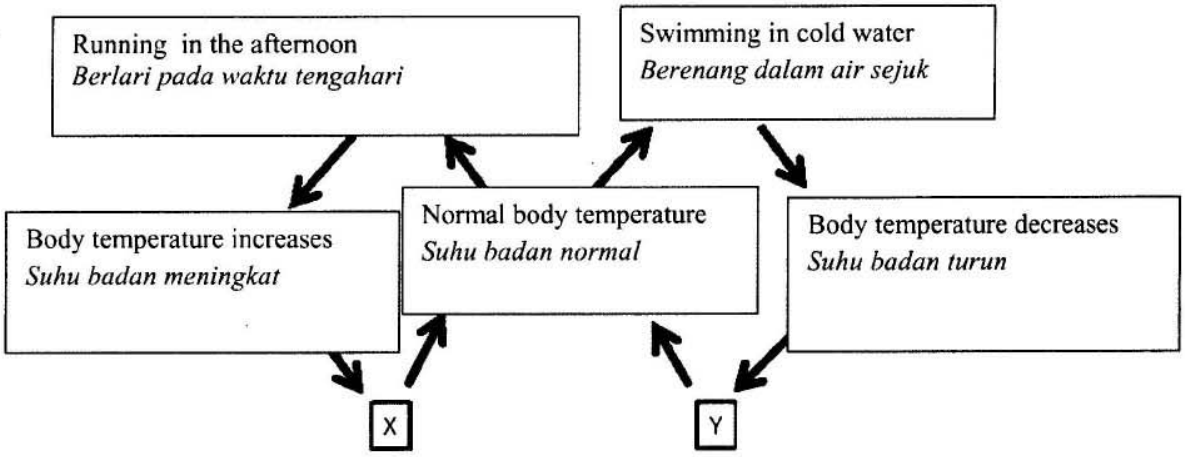

Diagram 18 / *Rajah 18*

Diagram 18 shows the regulation of body temperature in humans.
X and Y are corrective mechanism that happens to the arterioles. What are X and Y?
Rajah 18 menunjukkan kawalan suhu badan pada manusia. X dan Y adalah mekanisma pembetulan yang berlaku pada arteriol. Apakah X dan Y?

	X	Y
A	Vasodilation *Vasodilasi*	Vasoconstriction *Vasokontriksi*
B	Vasodilation *Vasodilasi*	Vasodilation *Vasodilasi*
C	Vasoconstriction *Vasokonstriksi*	Vasoconstriction *Vasokontriksi*
D	Vasoconstriction *Vasokonstriksi*	Vasodilation *Vasodilasi*

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41 Diagram 19a shows the response of a maize coleoptile to auxin in an experiment.
Rajah 19a menunjukkan gerak balas satu koleoptil jagung terhadap auksin dalam satu eksperimen.

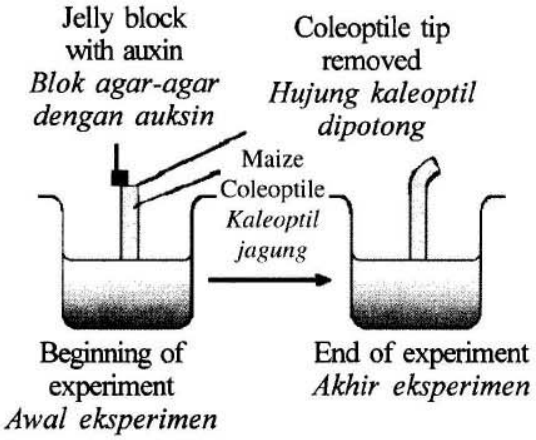


Diagram 19a / *Rajah 19a*

Another experiment produces a response as shown in Diagram 19b.
Eksperimen yang menghasilkan gerak balas seperti yang ditunjukkan dalam Rajah 19b.

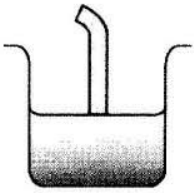
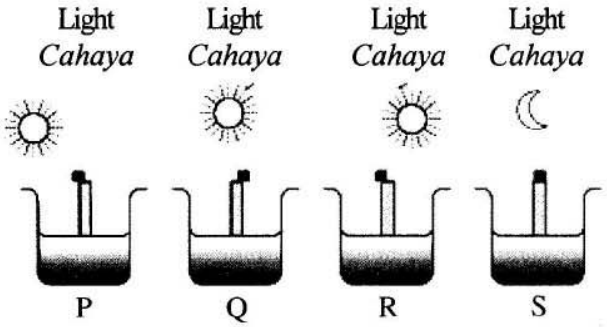


Diagram 19b / *Rajah 19b*

Which of the following conditions produce the response as shown in Diagram 19b?
Antara keadaan berikut, yang manakah menghasilkan gerak balas seperti yang ditunjukkan dalam Rajah 19b?



A Q and R
Q dan R
B P and Q
P dan Q
C P, R and S
P, R dan S
D Q, R and S
Q, R dan S

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42. Diagram 20 shows the spermatogenesis process in the male reproductive organ to produce male gametes.
Rajah 20 menunjukkan proses spermatogenesis di dalam organ pembiakan lelaki untuk menghasilkan gamet jantan.

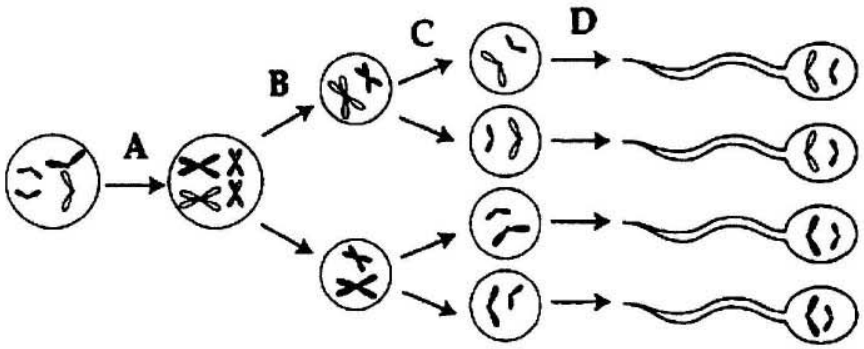

Diagram 20 / *Rajah 20*

Which stage labelled **A, B, C** and **D** involves differentiation of cells?
*Antara peringkat berlabel **A, B, C** dan **D**, yang manakah melibatkan pembezaan sel?*

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43. Diagram 21 shows the role of hormones in the menstrual cycle.
Rajah 21 menunjukkan peranan hormon dalam kitar haid.

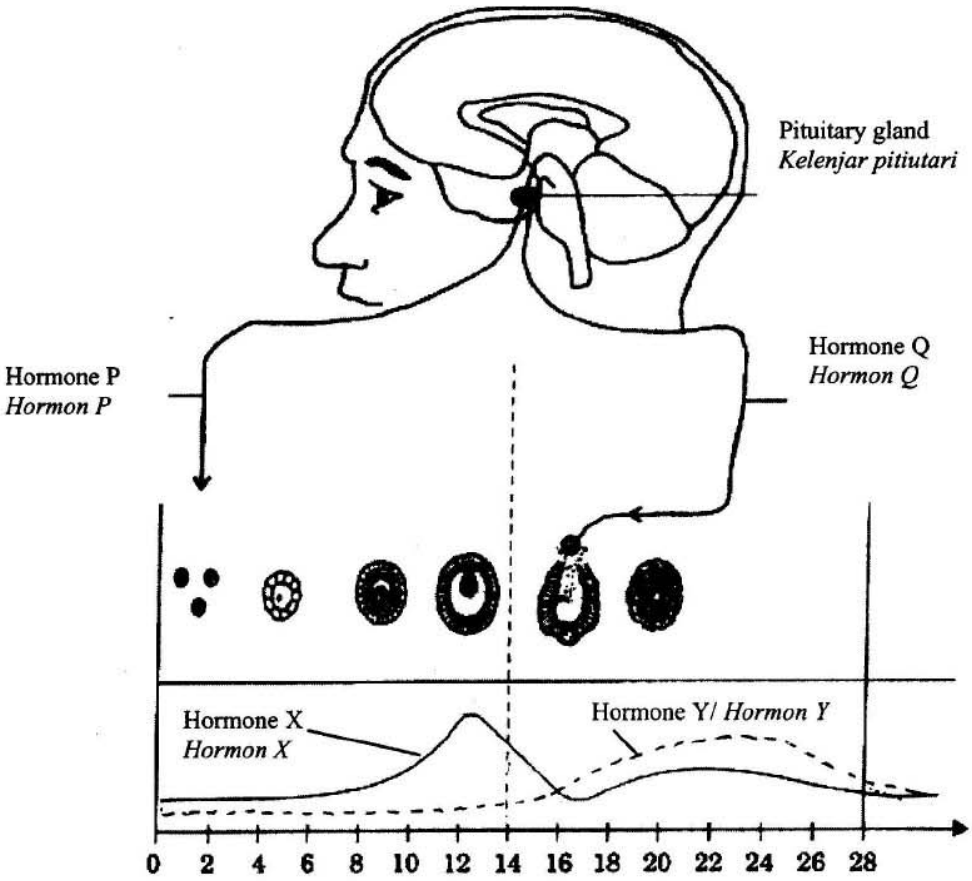

Diagram 22 / *Rajah 22*

What is hormones P, Q, X and Y?
Apakan hormon P, Q, X and Y?

	P	Q	X	Y
A	LH *LH*	FSH *FSH*	Oestrogen *Estrogen*	Progesterone *Progesteron*
B	FSH *FSH*	LH *LH*	Progesterone *Progesteron*	Oestrogen *Estrogen*
C	LH *LH*	FSH *FSH*	Progesterone *Progesteron*	Oestrogen *Estrogen*
D	FSH *FSH*	LH *LH*	Oestrogen *Estrogen*	Progesterone *Progesteron*

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44. Diagram 22 shows the development of a foetus in the uterus.
Rajah 22 menunjukkan perkembangan fetus di dalam uterus.

Diagram 22 / *Rajah 22*

What is the function of structure labelled T?
Apakah fungsi struktur berlabel T?

A Transport waste products to the foetus
Mengangkut hasil perkumuhan kepada fetus
B Transport oxygen and nutrients to the foetus
Mengangkut oksigen dan nutrien kepada fetus
C Transport oxygen and nutrients from the foetus
Mengangkut oksigen dan nutrien daripada fetus
D Transport antibody and hormones from the foetus
Mengangkut antibodi dan hormon daripada fetus

45. Which technique is correctly matched to the biological principle used in birth control methods?
Padanan manakah yang betul bagi teknik dan prinsip biologi yang digunakan dalam kaedah pencegahan kehamilan.

	Technique *Teknik*	Biological principle *Prinsip biologi*
A	Tubal ligation *Tubal ligasi*	The sperms cannot enter the uterus *Sperma tidak dapat memasuki uterus*
B	Spermicide *Spermisid*	Kills the sperms in fallopian tube *Membunuh sperma di dalam tiub fallopio*
C	Contraceptive pill *Pil pencegah kehamilan*	Inhibits the secretion of FSH and LH. *Merencatkan perembesan FSH dan LH*
D	IUD *IUD*	Prevents the entry of sperms into uterus *Mencegah kemasukan sperma ke dalam uterus*

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46. Diagram 23 shows a cross section of a carpel of a plant.
Which of the structure labelled **A, B, C** or **D**, is fertilized with male gamete to produce a diploid zygote?
Rajah 23 menunjukkan keratan rentas karpel satu tumbuhan.
*Antara struktur yang berlabel **A, B, C** dan **D**, yang manakah disenyawakan oleh gamet jantan untuk menghasilkan zigot diploid?*

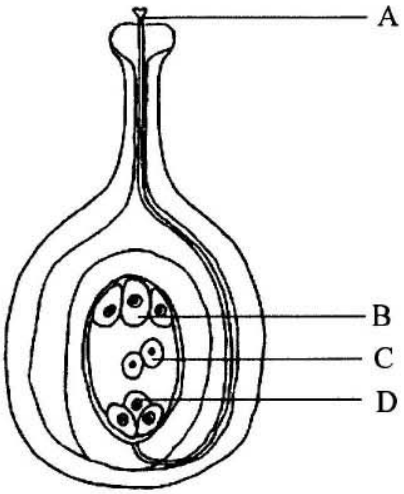

Diagram 23 / *Rajah 23*

47. Diagram 24 shows a cross section of a mature dicotyledonous stem.
Rajah 24 menunjukkan keratan rentas batang dikotiledon matang

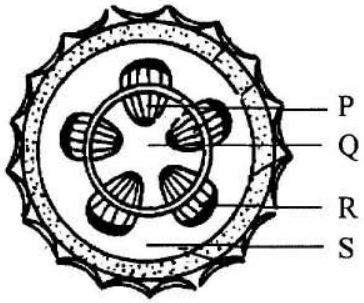

Diagram 24 / Rajah 24

Which of the labelled ***P, Q, R*** and ***S*** are produced during secondary growth?
*Antara bahagian yang berlabel **P, Q ,R** dan **S** yang manakah terhasil semasa pertumbuhan sekunder?*

A P and Q
P dan Q

B P and R
P dan R

C P, Q and R
P, Q dan R

D Q, R and S
Q, R dan S

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48. In pea plants, the allele for tall plant is dominant over the allele for dwarf plant.
Two heterozygous plants are cross-bred.
What is the chance of the offspring being tall plants?
Dalam tumbuhan kekacang, alel bagi ciri tinggi adalah dominan kepada alel untuk rendah.
Dua pokok heterozigot dikacukkan.
Apakah kebarangkalian untuk menghasilkan anak pokok yang tinggi?

A 25%
B 50%
C 75%
D 100%

49. Blood group in humans is determined by three alleles, I^A, I^B and I^O.
Which of the following are the possible genotypes for a person having a blood group B?
Kumpulan darah manusia ditentukan oleh tiga alel, I^A, I^B and I^O.
Antara berikut yang manakah merupakan genotip yang mungkin bagi seseorang yang berkumpulan darah B?

I $I^A I^A$
II $I^A I^B$
III $I^B I^B$
IV $I^B I^O$

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

50. Which of the following does **not** cause variation?
*Antara berikut, yang manakah **tidak** menyebabkan variasi?*

A Crossing over
Pindah silang
B Random fertilisation
Persenyawaan rawak
C Separation of sister chromotids
Pemisahan kromatid kembar
D Independent assortment of chromosomes
Pemilihan rawak kromosom

KERTAS SOALAN TAMAT

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SULIT

4551/2

NO. KAD PENGENALAN

ANGKA GILIRAN

4551/2
Biology
Paper 2
September
2011
2 ½ hours

JABATAN PELAJARAN NEGERI PERAK

PEPERIKSAAN PERCUBAAN SIJIL PELAJARAN MALAYSIA NEGERI PERAK 2011

BIOLOGY

PAPER 2

2 Hour 30 minutes

DO NOT OPEN THE QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO
JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Tulis **nombor kad pengenalan** dan **angka giliran** anda pada ruangan yang disediakan.
2. Kertas soalan ini adalah dalam dwibahasa.
3. Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.
4. Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.
5. Calon dikehendaki membaca maklumat di halaman belakang kertas soalan 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 soalan ini mengandungi 15 halaman bercetak dan 1 halaman tidak bercetak.

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Section A
Bahagian A
[60 marks]
[60 markah]
Answer **all** the questions in this section
*Jawab **semua** soalan dalam bahagian ini*

1 Diagram 1 shows the four levels of cell organisation in humans.
Rajah 1 menunjukkan empat aras organisasi sel pada manusia.

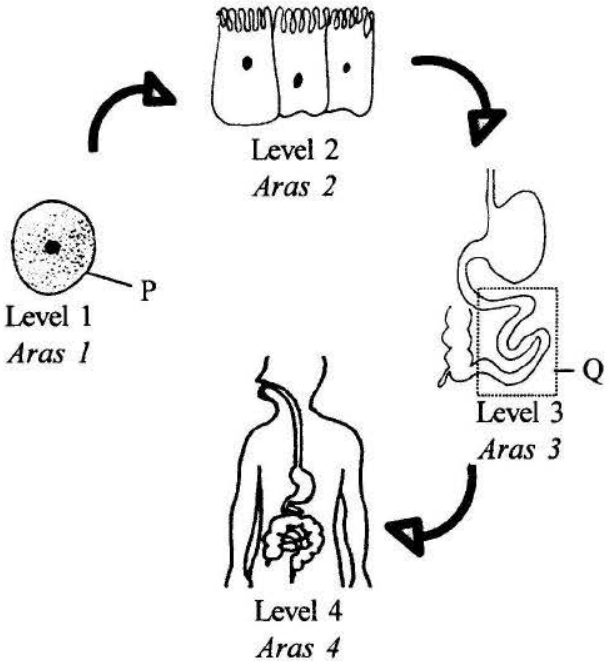

Diagram 1
Rajah 1

(a) (i) The cell is made up of a nucleus, cytoplasm and structure P. Name P.
Sel terdiri daripada nukleus, sitoplasma dan struktur P. Namakan P.

.....

[1 mark]

(ii) State **one** characteristic of P.
*Nyatakan **satu** ciri struktur P.*

.....

[1 mark]

(iii) Explain your answer in a(i).
Terangkan jawapan anda di a(i)

.....

.....

[1 mark]

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(b) (i) Complete the table below by naming Level 2 and Level 3.
Lengkapkan jadual di bawah dengan menamakan Aras 2 dan Aras 3.

Level / *Aras*	Name / *Nama*
1	Cell / *Sel*
2	
3	
4	System / *Sistem*

[2 marks]

(b) (ii) Level 1 (cell) undergo process X to become Level 2. What is X.
Aras 1 (sel) mengalami proses X untuk menjadi Aras 2. Namakan X.

.....

[1 mark]

(iii) What is the function of the structure in Level 2?
Apakah fungsi struktur dalam Aras 2?

.....

[1 mark]

(c) (i) The part labelled Q in Level 3 plays an important role in the absorption of digested food. Name **two** examples of digested food that are being absorbed by blood capillaries in Q.
*Struktur berlabel Q pada aras 3 memainkan peranan utama dalam penyerapan makanan tercerna. Namakan **dua** contoh makanan tercerna yang diserap ke dalam kapilari darah Q.*

1. .....

2. .....

[2 marks]

(ii) The digested food you stated in (d)(i) is transported to the liver through blood vessel, P. Name P.
Makanan tercerna yang anda namakan di (d)(i) diangkut ke hati melalui salur darah P. Namakan P.

.....

[1 marks]

(iii) Explain what will happen to the excess digested food stated in (c)(i).
Jelaskan apa akan berlaku kepada makanan tercerna yang dinyatakan di (c)(i) jika ia berlebihan.

.....

.....

.....

[2 marks]

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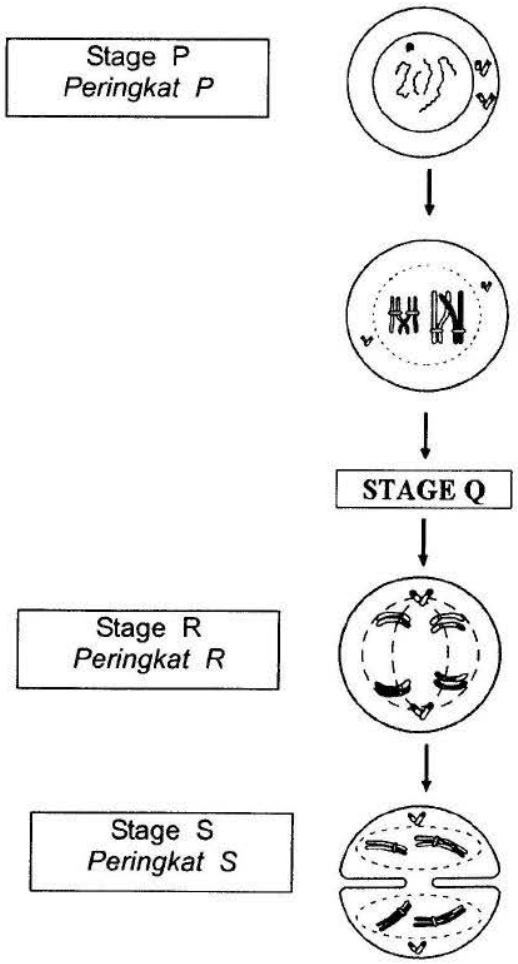
2. Diagram 2.1 shows the stages of meiosis I in an animal cell.
Rajah 2.1 menunjukkan peringkat-peringkat meiosis I di dalam satu sel haiwan.



(a) Name stage P and S
Namakan peringkat P dan S

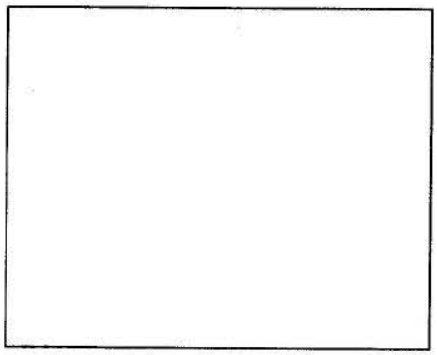
P. .....

S. .....

[2 marks]

(b) Draw the condition of cell during stage Q in the box below.
Lukiskan keadaan sel semasa peringkat Q di dalam kotak di bawah.

[2 marks]



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(c) Describe the chromosomal behaviour in stage R.
Huraikan kelakuan kromosom dalam peringkat R.

.....

.....

.....

[2 marks]

(d) Diagram 2.2 shows an ovum and a sperm forming a zygote through process X.
Rajah 2.2 menunjukkan pembentukan zigot daripada satu ovum dan satu sperma melalui proses X.

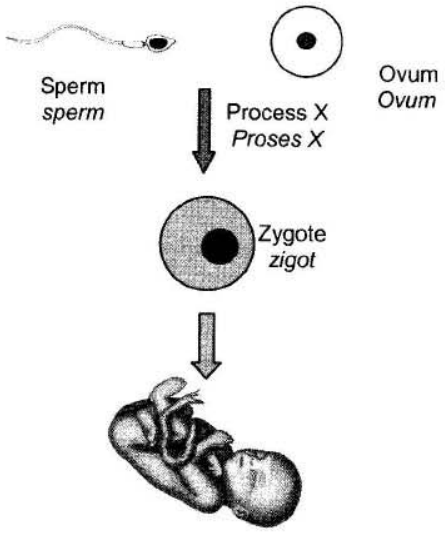

Diagram 2.2
Rajah 2.2

(i) Based on Diagram 2.2, what is process X?
Berdasarkan Rajah 2.2, apakah proses X?

.....

[1 mark]

This child is suffering from a type of genetic disorder. He has a moon face, slanted eyes, a short neck and a protruding tongue.
Kanak-kanak ini mengalami masalah gangguan genetik. Dia mempunyai muka berbentuk bulan, mata sepet, leher yang pendek dan lidah terjelir

(ii) Based on the information above, name the type of genetic disorder shown by the child.
Berdasarkan maklumat di atas, namakan jenis gangguan genetik yang dialami oleh kanak-kanak tersebut.

.....

[1 mark]

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(iii) The ovum in Diagram 2.2 carries 24 chromosome. Which chromosome has an extra copy?
Ovum di dalam Rajah 2.2 membawa 24 kromosom. Kromosom yang mempunyai bilangan yang berlebihan?

.....

[1 mark]

(iv) Explain how the abnormal chromosomal number in the ovum can cause the genetic disorder mentioned in d(ii).
Terangkan bagaimana bilangan kromosom yang tidak normal pada ovum boleh menyebabkan gangguan genetik yang anda nyatakan di d(ii).

.....

.....

.....

.....

[3 marks]

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3. Diagram 3.1 shows process M that occurs in the duodenum.
Rajah 3.1 menunjukkan proses M yang berlaku dalam duodenum

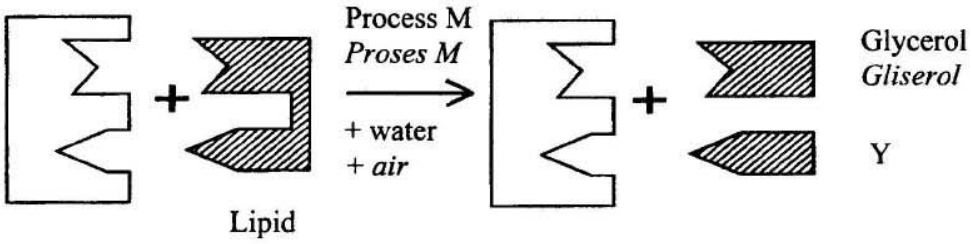


Diagram 3.1
Rajah 3.1

(a) Name process M and enzyme X.
Namakan proses M dan enzim X.

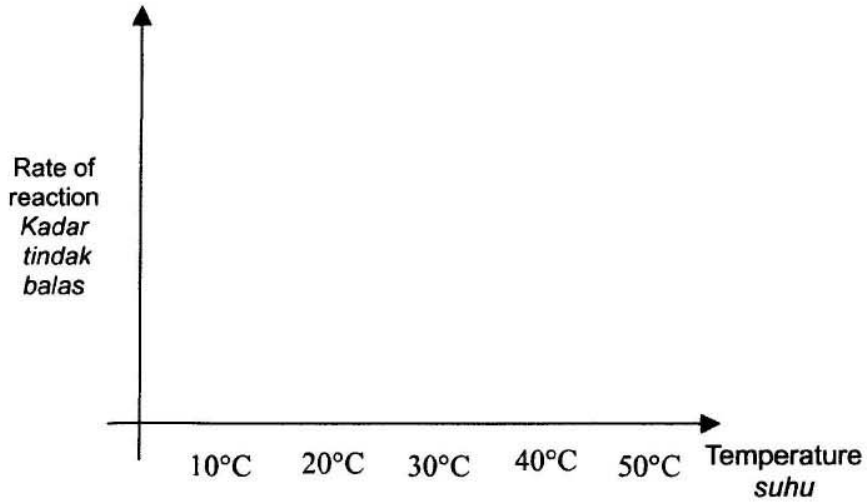
M: .....

X : .....

[2 marks]

(b) (i) Draw a graph to show the effect of temperature on the activity of enzyme X.
Lukiskan graf untuk menunjukkan kesan suhu ke atas tindak balas enzim X.

[2 mark]



(b) (ii) What is the optimum temperature for this reaction?
Apakah suhu optimum bagi tindak balas ini?

.....

[1 mark]

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(c) (i) Y is the product from the enzymatic reaction shown in Diagram 3.1. What is Y?
Y adalah hasil tindakbalas enzim yang ditunjukkan dalam Rajah 3.1. Apakah Y?

.....

[1 mark]

(ii) Explain the consequences of taking food with high content of Y for a long period.
Terangkan kesan pengambilan makanan yang mengandungi Y dalam kuantiti yang tinggi dalam jangka masa panjang.

.....

.....

.....

[2 marks]

(d) A student carried out an experiment using enzyme X. He replaced lipid with maltose as the substrate. At the end of the experiment, he observed that there was no reaction.
Seorang pelajar menjalankan satu eksperimen dengan menggunakan enzim X. Dia menggantikan lipid dengan maltosa sebagai substrat. Pada akhir eksperimen, dia mendapati tindak balas tidak berlaku.
Based on the lock and key hypothesis, explain the above statement.
Berdasarkan hipotesis mangga dan kunci, terangkan pernyataan di atas.

.....

.....

.....

.....

[4 marks]

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4 Blood circulatory system transport gases and nutrients to all parts of the body. It removes and excretes waste materials through the kidneys. It also protects our body from infection of diseases. Table 1 shows the body's defence mechanism.
Sistem peredaran darah mengangkut gas dan nutrien kepada semua bahagian badan. Ia mengeluarkan bahan kumuh melalui ginjal. Ia juga melindungi badan kita daripada jangkitan penyakit. Jadual 1 menunjukkan mekanisma pertahanan badan.

Body defence mechanism *Mekanisma pertahanan badan*	
Types of defences *Jenis pertahanan*	**Lines of defences** *Barisan pertahanan*
First line defence *Pertahanan pertama*	Skin and mucous *Kulit dan mukus*
Second line defence *Pertahanan kedua*	P
Third line defence *Pertahanan ketiga*	Q

Table 1
Jadual 1

(a) (i) Name P and Q.
Namakan P dan Q.

P : .....

Q : .....

[2 marks]

(ii) Explain how P plays it's role in defence mechanism.
Jelaskan bagaimana P memainkan peranannya dalam mekanisma pertahanan badan.

.....

.....

.....

[2 marks]

(b) (i) Name the substance produced by Q.
Namakan bahan yang dihasilkan oleh Q.

.....

[1 mark]

(ii) State the characteristic of the substance you stated in (b)(i).
Nyatakan ciri bahan yang anda namakan di (b)(i).

.....

[1 mark]

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(c) The diagram 4.1 and 4.2 shows the changes in the amount of antibodies of individual X and Y.
Rajah 4.1 dan 4.2 menunjukkan perubahan jumlah antibodi pada individu X dan Y.

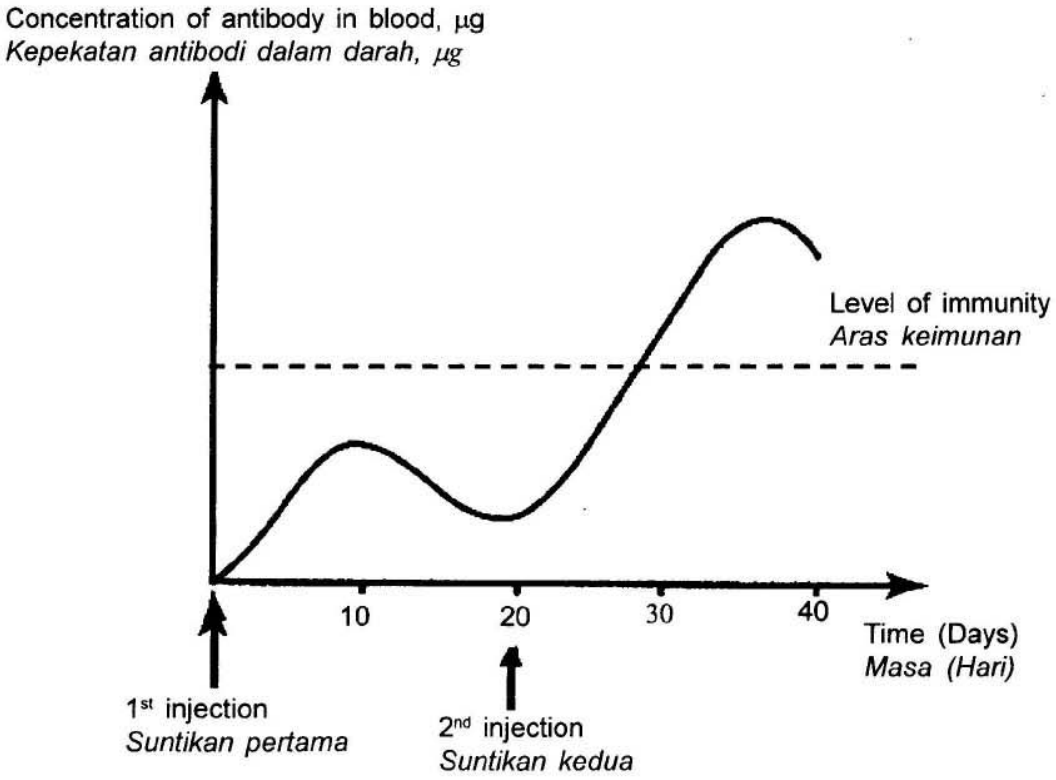

Diagram 4.1 : Concentration of antibody in individual X
Rajah 4.1 : Kepekatan antibodi dalam individu X

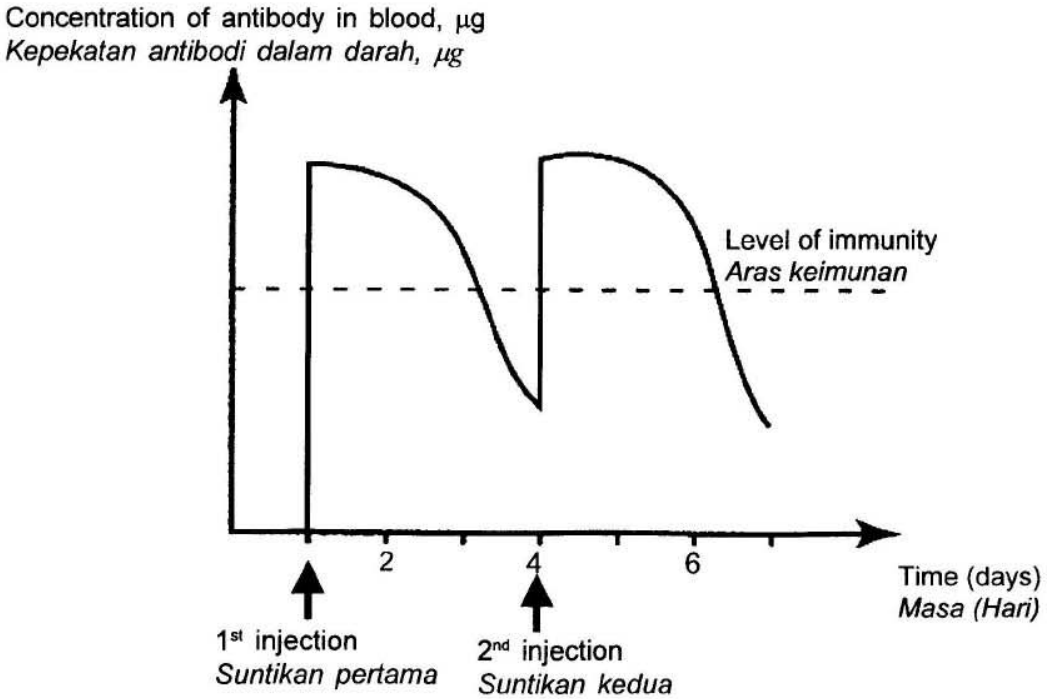

Diagram 4.2 : Concentration of antibody in individual Y
Rajah 4.2 : Kepekatan antibodi dalam individu Y

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(i) Based on Diagram 4.1 and 4.2, name the type of immunity in individual X and Y.
Berdasarkan Rajah 4.1 dan 4.2, namakan jenis keimunan pada individu X dan Y.

Individual X / *Individu X :*

.....

Individual Y / *Individu Y :*

.....

[2 marks]

(ii) Name the substances that are injected into the blood of individual X and Y.
Namakan bahan yang disuntik ke dalam darah individu X dan Y.

X : .....

Y : .....

[2 mark]

(iii) Explain the difference in the concentration of antibody in the blood of individual X and Y after the second injection.
Jelaskan perbezaan antara kepekatan antibodi dalam darah individu X dan Y selepas suntikan kedua.

.....

.....

.....

.....

[2 marks]

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5. Diagram 5.1 shows the formation of Y through process X in a typical plant.
Rajah 5.1 menunjukkan pembentukan butir debunga melalui proses X pada satu tumbuhan

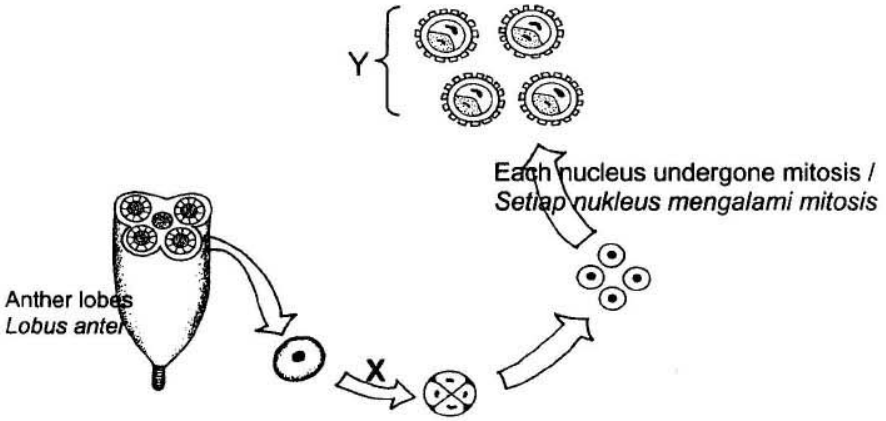

Diagram 5.1
Rajah 5.1

(a) (i) Name X and Y.
Namakan X dan Y.

X : .....

Y : .....

[2 marks]

(ii) State **two** characteristics of Y.
*Nyatakan **dua** ciri Y.*

.....

.....

[2 marks]

(b) (i) Name the process when Y is transferred to the stigma.
Namakan proses pemindahan Y ke stigma.

.....

[1 mark]

(ii) Explain how the process you named in (b)(i) take place.
Huraikan bagaimana proses yang anda namakan di (b)(i) berlaku.

.....

.....

.....

[2 marks]

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(c) Diagram 5.2 shows the germination of pollen tube towards the embryo sac in flowering plants.
Rajah 5.2 menunjukkan percambahan tiub debunga ke arah pundi embrio pada tumbuhan berbunga.

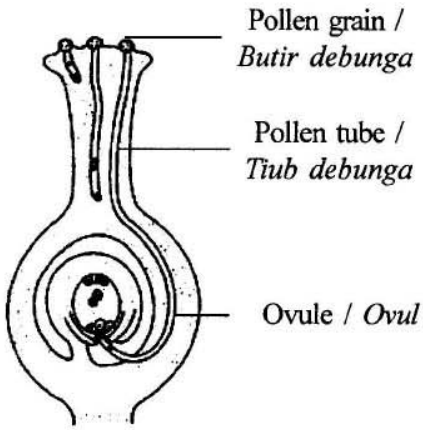

Diagram 5.2
Rajah 5.2

(i) Based on Diagram 5.2, explain the fertilisation process in embryo sac.
Berdasarkan Rajah 5.2, terangkan proses persenyawaan dalam pundi embrio.

.....

.....

.....

.....

[3 marks]

(ii) Explain the significance of double fertilisation in flowering plants.
Huraikan signifikan persenyawaan ganda dua dalam tumbuhan berbunga.

.....

.....

.....

.....

[2 marks]

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Section B
Bahagian B
(40 marks)
(40 marks)
Answer any **two** questions
*Jawab **mana-mana dua** soalan*

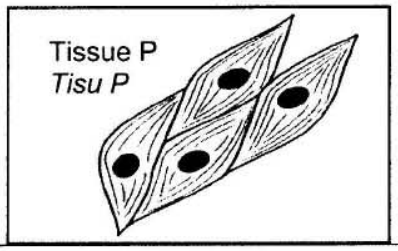
6 (a) Starch is a complex molecule. Digestion of starch is carried out by several enzymes along the alimentary canal. Describe how glucose is produced from the digestion of starch along the alimentary canal.
Kanji adalah molikul kompleks. Pencernaan kanji dijalankan oleh beberapa enzim di sepanjang salur alimentari. Huraikan bagaimana glukosa terbentuk dari pencernaan kanji di sepanjang salur alimentari.

[6 marks]

(b) Explain how glucose is transferred from the small intestine to the body cells.
Terangkan bagaimana glukosa dipindahkan dari usus kecil ke semua sel tubuh.

[6 marks]

(c)



Glucose + Oxygen → Energy + water + carbon dioxide
Glukosa + Oksigen → Tenaga + Air + Karbon dioksida

The above process takes place in tissue P in the presence of oxygen.
Name and explain the process.
Proses di atas berlaku dalam tisu P dalam kehadiran oksigen.
Namakan dan terangkan proses tersebut.

[8 marks]

7 (a) Explain how muscles, tendons, ligaments, bones and joints are involved when an individual is running or walking.
Huraikan bagaimana otot, tendon, ligamen, tulang dan sendi terlibat semasa seseorang berlari atau berjalan.

[10 marks]

(b)

A boy saw a fierce dog barking and running towards him.
The boy ran away and finally climbed up the big tree.
Seorang budak lelaki melihat seekor anjing yang garang menyalak dan berlari ke arahnya. Budak tersebut berlari dengan laju dan akhirnya memanjat sebatang pokok besar.

Explain how the endocrine system and nervous system both work together to bring about immediate response of the boy in the above situation.
Jelaskan bagaimana sistem endokrin dan sistem saraf bekerjasama dalam mengawal gerak balas spontan budak lelaki dalam situasi di atas.

[10 marks]

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8 (a) Edmond and his wife Sophie have a pair of twin daughters. The DNA test shows that the genetic composition of the twins are different. Explain how this situation happens.
Edmond dan isterinya Sophie dikurniakan anak kembar perempuan. Hasil ujian DNA mendapati kandungan genetik kedua-duanya berbeza. Jelaskan bagaimana situasi ini boleh berlaku.

[10 marks]

(b) Mutation causes changes in the genetic material of an organism. Discuss how these changes can lead to changes in human characteristics and affect the person during his lifetime.
Mutasi menyebabkan perubahan-perubahan ke atas bahan genetik organisma. Bincangkan bagaimana perubahan ini menyebabkan perubahan dalam ciri-ciri manusia.

[10 marks]

9 (a)

Farm A / *Ladang A* :
- Area is 10 acres / *Luas 10 ekar*
- Planted with maize / *Ditanam dengan jagung*
- Use organic and inorganic fertilizers / *Menggunakan baja organik dan bukan organik*
- Watered daily / *Disiram setiap hari*
- No weeds / *Tiada rumpai*

Farm B / Ladang B :
- Area is 10 acres / *Luas 10 ekar*
- Planted with maize / *Ditanam dengan jagung*
- Use organic and inorganic fertilizers / *Menggunakan baja organik dan bukan organik*
- Watered daily / *Disiram setiap hari*
- Overgrown with weeds / *Ditumbuhi rumpai*

Based on your Biology knowledge, predict the production of crops in these two farms. Explain your answer.
Berdasarkan pengetahuan Biologi anda, jangkakan hasil tanaman yang akan diperolehi dari kedua-dua ladang ini. Terangkan jawapan anda.

[10 marks]

(b) The farmers can use herbicides, pesticides or fungicides to overcome the crop's problem caused by weeds, pest or fungi. However these chemicals will cause environmental hazards Discuss the issue.
Petani boleh menggunakan racun rumpai, racun serangga atau racun kulat untuk mengatasi masalah tanaman yang disebabkan oleh rumpai, serangga perosak atau kulat. Walaubagaimanapun bahan-bahan kimia ini boleh menyebabkan bahaya yang besar kepada alam sekitar.
Bincangkan isu ini.

[10 marks]

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SULIT

4551/3

NO. KAD PENGENALAN

ANGKA GILIRAN

4551/3
BIOLOGY
Paper 3
September
2011
1 ½ hours

YAYASAN PERAK

JABATAN PELAJARAN NEGERI PERAK

PEPERIKSAAN PERCUBAAN SIJIL PELAJARAN MALAYSIA NEGERI PERAK 2011

BIOLOGY

PAPER 3

1 hour 30 minutes

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1 Tulis **nombor kad pengenalan** dan **angka giliran** anda pada ruangan yang disediakan.

2 Kertas soalan ini adalah dalam dwibahasa.

3 Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.

4 Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.

5 Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.

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

Kertas soalan ini mengandungi 10 halaman bercetak dan 2 halaman tidak bercetak

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1. A group of students conducted an experiment to investigate the level of water pollution in three water samples from the drain, river and school pond. 100 ml of each water sample is filled in 3 different reagent bottles and is covered immediately. In the laboratory, a syringe is used to add 1 ml of 0.1% methylene blue solution to the base of of each water sample as shown in Diagram 1. The bottles are immediately closed again and placed in a dark cupboard. The time taken for the methylene blue solution in each sample to decolourise is shown in Table 1.

Sekumpulan pelajar telah menjalankan ekperimen untuk mengkaji tahap pencemaran bagi tiga sampel air dari longkang, sungai dan kolam sekolah. 100 ml sampel air dimasukkan ke dalam 3 botol reagen yang berlainan dan ditutup serta merta. Di dalam makmal, picagari digunakan untuk memasukkan 1 ml 0.1% larutan metilena biru ke dasar botol reagen seperti dalam Rajah 1. Ketiga-tiga botol reagen sekali lagi ditutup serta-merta dan diletakkan di dalam almari gelap. Masa yang diambil untuk larutan metilena biru meluntur di dalam setiap sampel air ditunjukkan dalam Jadual 1.

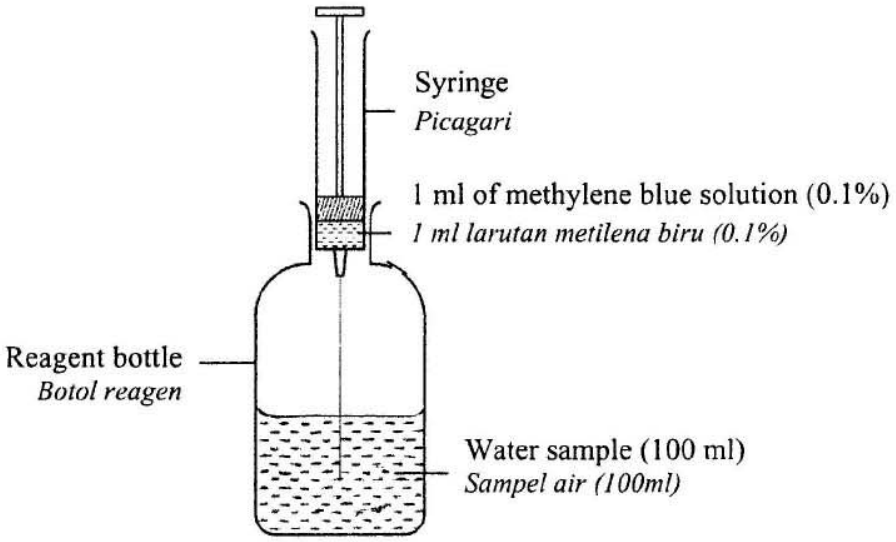

Diagram 1
Rajah 1

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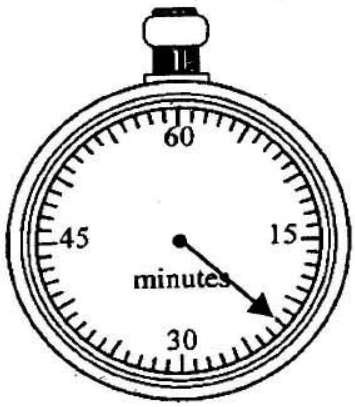
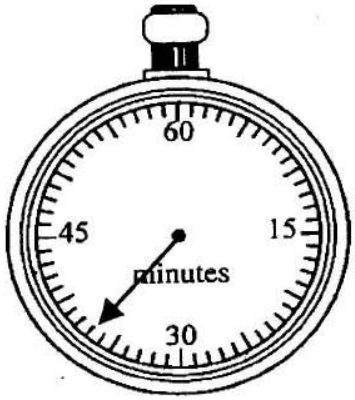
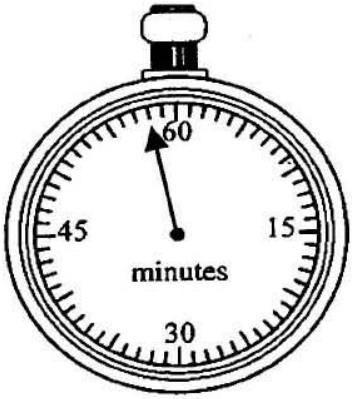
Water Sample *Sampel Air*	Time taken for the methylene blue solution to decolourise (minutes) *Masa yang diambil untuk larutan metilene biru meluntur(minit)*
Drain Water *Air Longkang*	
River Water *Air Sungai*	
School Pond Water *Air Kolam* *Sekolah*	

Table 1
Jadual 1

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For examiner's use

1(a)

3

(a) Record the time taken for the methylene blue solution to decolourise in Table 1.
Rekodkan masa yang diambil oleh larutan metilena biru untuk meluntur di dalam Jadual 1. [3 *marks*]

(b) (i) State two different observations made from Table 1.
Nyatakan dua pemerhatian yang berbeza yang dibuat daripada Jadual 1.

Observation 1 / *Pemerhatian 1* :

.....

.....

Observation 2 / *Pemerhatian 2* :

.....

.....

1(b)(i)

3

[3 *marks*]

(ii) State the inferences from the observations in 1(b)(i).
Nyatakan inferens daripada pemerhatian di 1(b)(i).

Inference from observation 1 :
Inferens daripada pemerhatian 1 :

.....

.....

Inference from observation 2 :
Inferens daripada pemerhatian 2 :

.....

.....

1(b)(ii)

3

[3 *marks*]

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(c) Complete Table 2 based on the experiment that was carried out.
Lengkapkan Jadual 2 berdasarkan eksperimen yang telah dijalankan.

For examiner's use

Variable ***Pembolehubah***	**Method to handle the variable** ***Cara mengendali pembolehubah***
Manipulated variable *Pembolehubah dimanipulasikan*	....
Responding variable *Pembolehubah bergerak balas*	....
Constant variable *Pembolehubah dimalarkan*	....

Table 2
Jadual 2

[3 *marks*]

1(c) 3

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

.....

.....

.....

[3 *marks*]

1(d) 3

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For examiner's use

(e) (i) Construct a table and record all the data collected in this experiment.
Bina satu jadual dan rekodkan semua data yang telah dikumpul dalam eksperimen ini.
Your table should have the following titles :
Jadual anda hendaklah mengandungi tajuk-tajuk berikut :

- Water sample
  Sampel air
- Time taken for methylene blue solution to decolourise.
  Masa yang diambil untuk larutan metilena biru meluntur.
- Level of water pollution represented by numbers 1, 2 and 3 (3 as the most polluted and 1 as the least polluted)
  Tahap pencemaran yang diwakili oleh nombor 1, 2 dan 3 (3 sebagai paling tercemar dan 1 sebagai paling kurang tercemar)

1(e)(i) 3

[3 *marks*]

(e) (ii). Use the graph paper provided on page 7 to answer this question.
The time taken for the methylene blue solution to decolourise represents the level of pollution in the water sample.
Using the data in 1(e) (i), draw a bar chart to show the relationship between the pollution level and the different water sample.

Gunakan kertas graf di muka surat 7 untuk menjawab soalan ini.
Masa yang diambil untuk larutan metilena biru meluntur mewakili tahap pencemaran dalam sampel air.
Menggunakan data di 1(e)(i), lukis satu carta bar untuk menunjukkan hubungan antara tahap pencemaran dan sampel air yang berbeza.

1(e)(ii) 3

[3 *marks*]

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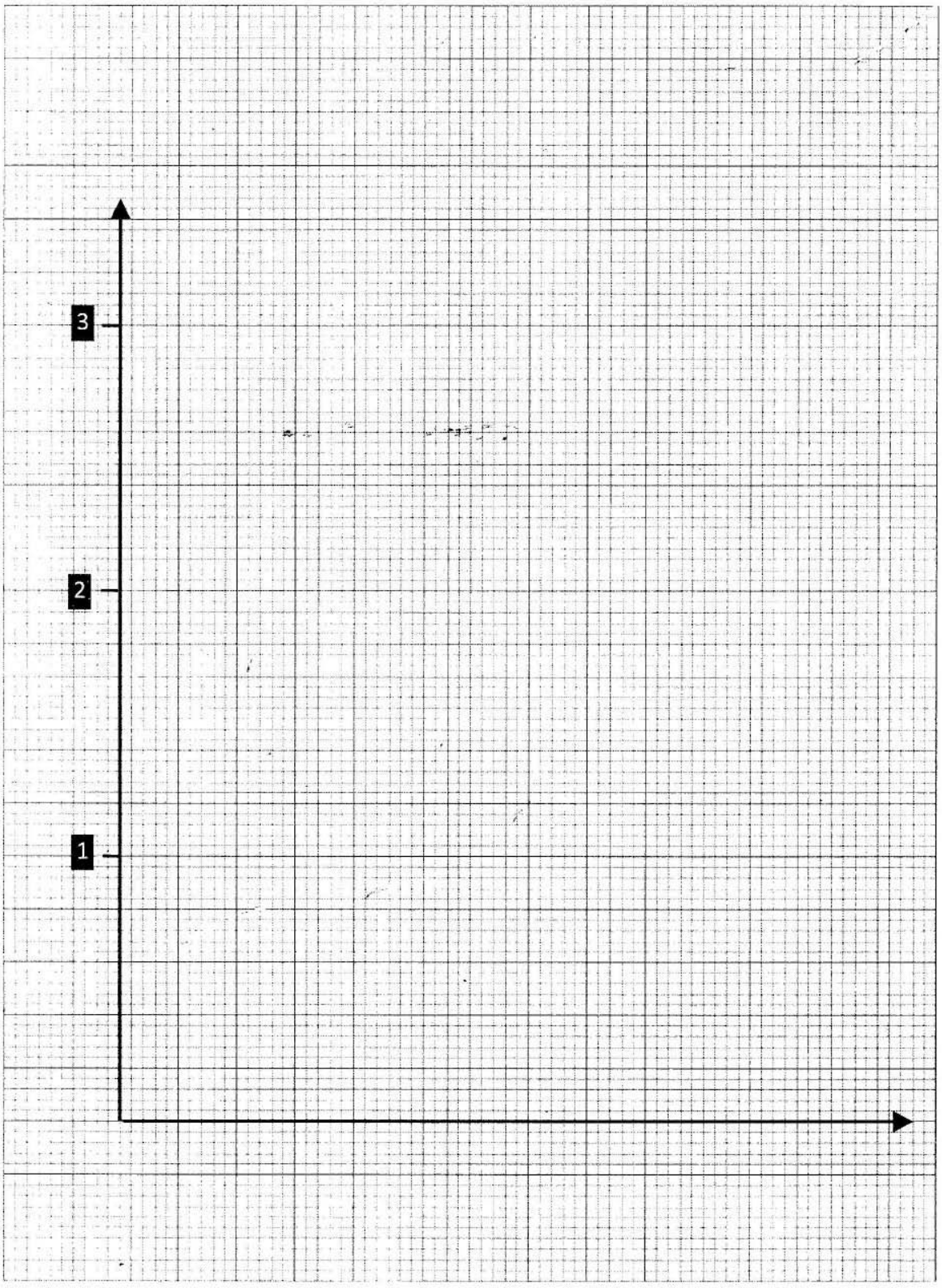
Pollution level against the different water samples.
Tahap pencemaran melawan sampel air yang berbeza.



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For examiner's use

(f) Based on the bar chart in 1(e) (ii), explain the relationship between the time taken for the methylene blue solution to decolourise and the level of water pollution.
Berdasarkan carta bar di 1(e)(ii), terangkan hubungan antara masa yang diambil oleh larutan metilena biru untuk meluntur dan tahap pencemaran air.

.....

.....

.....

.....

1(f) 3

[3 *marks*]

(g) A student shakes the reagent bottle containing the drain water and methylene blue solution vigorously and left it on the table without covering it.
Predict the time taken for the methylene blue solution to decolourise.
Explain your prediction.

Seorang pelajar menggoncang dengan kuat botol reagen yang mengandungi air longkang dan larutan metilena biru dan meninggalkannya di atas meja tanpa menutupnya.
Ramalkan masa yang diambil untuk larutan metilena biru meluntur.
Terangkan ramalan anda.

.....

.....

.....

.....

1(g) 3

[3 *marks*]

(h) State the operational definition for the level of water pollution.
Berdasarkan eksperimen, nyatakan definasi secara operasi bagi tahap pencemaran air?

.....

.....

1(h) 3

[3 *marks*]

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(i) The following list is part of the apparatus and materials used in this experiment.
Senarai berikut adalah sebahagian daripada bahan dan radas yang digunakan dalam eksperimen ini.

For examiner's use

Water samples *Sampel air*	Stopwatch *Jam randik*	Measuring cylinder *Silinder penyukat*
0.1% Methylene blue solution *0.1% Larutan metilena biru*		Syringe *Picagari*

Complete Table 3 by classifying the apparatus and materials used in this experiment.

Lengkapkan Jadual 3 dengan mengelaskan radas dan bahan yang digunakan dalam eksperimen ini.

Materials *Bahan*	Apparatus *Radas*

Table 3
Jadual 3

[3 *marks*]

1(i)
3

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2. A balanced diet is essential for the healthy growth and development of human body. So a correct proportion of carbohydrates, proteins, lipids, vitamins, minerals, water and roughage must be taken to meet the daily requirement of the body.
Diet yang seimbang diperlukan untuk tumbesaran yang sihat dan perkembangan badan manusia. Oleh itu, karbohidrat, protein, lipid, vitamin, mineral, air dan serat mesti diambil dalam kadar yang menepati keperluan harian badan.

A nutritionist is required to identify the energy value some food samples. She is given a ground nut, a dried coconut flake and small piece of bread. She has to plan an experiment to investigate the energy value of food sample.
Seorang pakar makanan diminta untuk mengenal pasti nilai tenaga beberapa sampel makanan. Beliau diberi sebiji kacang tanah, sekeping kelapa kering dan sepotong kecil roti. Beliau perlu merancang satu eksperimen untuk menyiasat kandungan dalam sample makanan.

The planning of your experiment must include the following aspects:

Perancangan eksperimen tersebut mestilah mengandungi aspek-aspek berikut:

- Problem statement
  Penyataan masalah
- Hypothesis
  Hypothesis
- Variables
  Pembolehubah
- List of the apparatus and material
  Senarai radas dan bahan
- Experimental procedure
  Prosedur eksperimen
- Presentation of data
  Persembahan data

[17 marks]

KERTAS SOALAN TAMAT

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JABATAN PELAJARAN NEGERI PERAK

PEPERIKSN PERCUBAAN

SIJIL PELAJARAN MALAYSIA 2011

BIOLOGY 4551

PAPER 1, 2 AND 3

MARKING SCHEME

PAPER 1

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

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PAPER 2

SECTION A [60 MARKS]

Question			Marking Criteria	Marks
1	(a)	(i)	Plasma membrane	1
		(ii)	Semi permeable	1
		(iii)	Allow certain substances to pass through freely while others cannot.	1
	(b)	(i)	Level 2 - Tissue Level 3 - Organ	1 1
		(ii)	Differentiation	1
		(iii)	Secretes enzyme / juice / hydrochloric acid / secretes mucous/ absorption of digested food	1
	(c)	(i)	1. Amino acid 2. Glucose	1 1
		(ii)	Hepatic portal vein	1
		(iii)	- Excess glucose is converted to glycogen and store in the liver / muscle - Excess amino acid undergo deamination to form urea / nitrogenous waste products to be removed through the kidneys	1 1
TOTAL				12
2	(a)		P – Interphase S – Telophase I	1 1
	(b)		 L – location of homologous chromosome (at equatorial plate) P – correct pairing	 1 1
	(c)		P1 - Homologous chromosomes separate P2 - move to opposite poles	1 1
	(d)	(i)	Fertilisation	1
		(ii)	Down's syndrome	1
		(iii)	Chromosome number 21	1
		(iv)	P1 – Chromosomes number 21 fails to separate during anaphase I // non -disjunction of chromosome number 21 during anaphase I P2 – when fertilisation occurs, 24 chromosomes in the ovum will fused with 23 chromosomes in the sperm P3 – produce zygote with 47 chromosomes// trisomy 21	1 1 1
TOTAL				12

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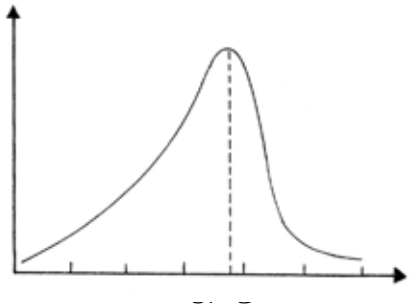
3	(a)		M – Hydrolysis X – lipase	1 1
	(b)	(i)	Optimum temperature  Draw Label	 1 1
		(ii)	37°C	1
	(c)	(i)	Y – Fatty acid.	1
		(ii)	P1 – Fat deposit at the inner wall of arteries // cause arterosclerosis P2 – The individual will suffered cardiovascular diseases// high blood pressure // stroke// heart attack P3 – If the blood clot in the blood vessel, the individual will suffered coronary thrombosis	1 1 1
	(d)		P1 – active site of enzyme X is not complement to the shape of maltose P2 – Maltose cannot bind to enzyme X P3 – no enzyme substrate complex is formed P4 – maltose is not hydrolysed/ broken down	1 1 1 1
TOTAL				12
4	(a)	(i)	P – Leucocyte / white blood cells/ phagocytes / monocyte / neutrophyll Q – Lymphocytes	1 1
		(ii)	- White blood cell / phagocytes engulf the pathogen - By phagocytosis - Hydrolytic enzyme / lysozyme digest/ breakdown the pathogen, (product are absorbed) [Any 2]	1 1 1 [2 m]
	(b)	(i)	Antibody	1
		(ii)	Specific	1
	(c)	(i)	Individual X : Artificial / (Acquired) active immunity Individual Y : Artificial / (Acquired) passive immunity	1 1
		(ii)	X – Vaccine Y – Antiserum	1
		(iii)	- In X, after second injection, the concentration of antibody increases slowly and become higher than immunity level and is maintained for a long time. - In Y, after the second injection, the concentration of antibody	1 1

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			reduces slowly to below the immunity level.	
TOTAL				12
5	(a)	(i)	X : Meiosis Y : Pollen grains	1 1
		(ii)	- Have 2 nuclei i.e tube nucleus and generative nucleus - Haploid - Have very rough surface	1 1 1
	(b)	(i)	Pollination	1
		(ii)	- Pollinating agent (wind / water/ animal) - Transfer the pollen onto the stigma - Pollen grain will stick onto the surface of the stigma	1 1 1 Any 2
	(c)	(i)	- One male gamete will fuse with the egg cell to form a diploid zygote - Another male gamete will fuse with 2 polar nuclei to form triploid nucleus - Both process take place at the same time // double fertilisation occurs	1 1 1
		(ii)	- Diploid zygote will developed to form an embryo - Triploid nucleus will developed to form the endosperm tissue - Endosperm tissue nourishes the developing embryo [Any 2]	1 1 1 [2 m]
TOTAL				12

SECTION B [40 MARKS]

Question		Marking Criteria	Marks
6	(a)	- Saliva is secreted by the salivary glands in the mouth - Salivary gland secretes amylase / Saliva contain amylase - Amylase will hydrolyse starch into maltose - Remaining starch and maltose enters the stomach - (Stomach do not contain carbohydrase), so no digestion of carbohydrate - Will take place in stomach - Duodenum received pancreatic amylase from pancrease - Pancreatic amylase will hydrolyse the remaining starch into maltose - The wall of illeum secretes maltase - Maltase will hydrolyse maltose into glucose [Any 6]	1 1 1 1 1 1 1 1 1 1 [6 m]
	(b)	- Glucose in the lumen of small intestine enter the epithelial cells by active transport - Glucose from epithelial cells enter blood capillary by facilitated diffusion - Blood carry the glucose into the hepatic portal vein - Heaptic portal vein channel the blood containing glucose into the liver - Liver cells will use/ assimilate some of the glucose	1 1 1 1 1

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		- Blood then send the glucose to the heart via hepatic vein and then vena cava - Heart pump the blood to all body cells - Glucose diffused from the blood capillary into the body cells by facilitated diffusion. [Any 6]	1 1 1 [6 m]
	(c)	- Process is called aerobic respiration - Glucose diffuse into cells P from blood capillary - Oxygen also diffuse into cells P from the blood capillary - Cells P contain a lot of mitochondria - Mitochondria (contain enzymes) for cell respiration// mitochondria carry out cell respiration - Oxidation of glucose (take placed in mitochondria) - In a series of reactions catalysed by respiratory enzymes in mitochondria - 1 molecules of glucose will produce 38 molecules ATP / more ATP are produced - Water and carbon dioxide are released as waste material in this process [Any 8]	1 1 1 1 1 1 1 1 1 [8 m]
		TOTAL	20
7	(a)	- Tendons connect the muscles to the bones - Tendons are strong and non-elastic - Tendons transfer the force from the muscles to the bones - Ligaments connect two bones together at the joint to give support and strength - Ligaments make the movement at the joint possible - Ligaments are strong and elastic - The muscles work in pairs but in opposite manner / antagonistic - Quadriceps femoris / extensor muscle contracts while biceps femoris / flexor muscle relaxes, leg is straightened - Quadriceps femoris / extensor muscle relaxes and biceps femoris/ flexor muscle contracts, the leg is bent - Calf muscles contracts to lifted up the heels - Feet is pushed downward and backward, - Produced force on the ground - The boy is pushed forward - Contraction and relaxation of the muscles are repeated, so the boy can run or walk [Any 10]	1 1 1 1 1 1 1 1 1 1 1 1 1 1 [10 m]
	(b)	- Light enters the retina and the image of the fierce dog is formed - Nerve impulses is generated by the sensory nerves at the retina - The nerves impulses are transmitted to the brain/ central nervous system to be analysed / interpreted - Sound waves enter the cochlea in the ears - The nerve impulses are generated and transmitted to the brain /	1 1 1 1 1

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		central nervous system to be analysed / interpreted - The hypothalamus is activated to send nerve impulses directly to the adrenal medulla - Adrenal medulla secretes adrenaline into the blood stream - Adrenaline will increase the metabolic rate - It stimulates the heart to beat faster - And also increase the breathing rate - And increase the conversion of glycogen to glucose - Finally send <u>more</u> oxygen and glucose to the brain and skeletal muscles - The brain is highly alert to mobilise the various parts of the body for immediate action - The skeletal muscles become energised to flee immediately from danger to run away from danger / to climb a big tree. - This reaction is called the fight-or-flight action - These changes will prepares the boy to respond to the dangerous situation / threatening situation [Any 10]	1 1 1 1 1 1 1 1 1 1 [10 m]
TOTAL			20
8	(a)	- Edmond produced haploid gametes / sperms by meiosis - Sperms have different genetic compsition / show variation - Because crossing over takes place at prophase 1 meiosis - The genetic content is exchanged between the homologous chromosomes - Sophie's ovary produced 2 ova at that moment of time - Both ova have different genetic content - When the two different sperms fertilise the two different ova - Two different zygotes will be produced - These two different zygote will undergo mitosis repeatly to develop into embryo - The two embryo will develop into the foetus with different/ same - Gender (In this case, they have the same gender) - Each of them may have different genotype/ genetic content - Each of them also may have different phenotype - For example the blood group, the skin colour, and the type of hair (curly / straight) may differ - Fraternal / non-identical twin [Any 10]	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 [10 m]
	(b)	- Mutagens are substances/ factors which cause mutation - Examples of mutagens are radiations (gamma rays / UV ray / x-rays) from radioctives substances or chemicals such as preservatives / benzene / formaldehyde / asbestos / carbon tetrachloride / mustard gas / tar in tobacco - Mutation will cause a permanent change to the gene or chromosomes / structures - Carcinogenic substances can cause cancer	1 1 1 1

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		- So mitosis will take place (repeatedly) out of control // uncontrolled mitosis - The new cells will be reproduced very fast - The cells become malfunction - Chromosomal mutation also will cause improper segregation/ non-disjunction) of homologous chromosomes during meiosis - So the gametes produced may have one extra chromosome or less one chromosome / abnormal number of chromosomes - This situation will cause the formation of abnormal gametes - An abnormal gamete is meiosis with a normal gamete, an abnormal zygote will be produced - The abnormal zygote will develop into a baby, the baby will have genetic disorder - For example down meiosis baby have 47 chromosomes, an extra chromosomes at the chromosome number 21 - Klinefilter's syndrome baby has 45 chromosomes - During meiosis, the chromosome structure can also be changed by deletion / inversion / duplication / translocation through mutation - Gene mutation can occur by substitution , insertion or deletion - (These situations) will cause genetic disorder such as sickle-cell anaemia / haemophilia / albinism - These genetic disorder will be inherited and can cause early death [Any 10]	1 1 1 1 1 1 1 1 1 1 1 1 1 1 [10 m]
TOTAL			20
9	(a)	Farm A :- - The production is high - The maize produce big corn - The maize get enough water, nutrient and light - Because there is no competition between the maize and the weeds - So the rate of photosynthesis is very high Farm B :- - The production is low - The maize will produce smaller corn - T he maize do not get enough water, nutrient and light - Because interspecific competition occurs between the maize and the weeds - Both compete for the same space, nutrient, light and water - So the rate of photosynthesis will be lower - The rate of growth of the maize is also lower. [Any 10]	 1 1 1 1 1 1 1 1 1 1 1 1 [10 m]
	(b)	- Fungicides, herbicides or pesticides are chemical substances used to control the organisms which destroy the crops - These substances not only kill the fungi, weeds and insects / control the population of the organisms which destroy the crops but also harmless organisms	1 1

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		- The organisms will be extinct / become infertile - The effect is very fast / immediate - This method is known as chemical control - The effects of herbicides, fungicides or pesticides can be persistent and will remain in the environment for long periods - It will enter the food chain through water/ soil - The concentration of toxic substances accumulated will increases as the trophic level increases / may accumulate in the tissues of final consumers - It will be toxic to human health - Some chemical substances are mutagens - It can cause mutations in humans - The pests/ fungi/ weeds will become immune to chemical substances / develop resistance - So we cannot control the population anymore / a larger amount of pesticides may now be required to produce a similar effect - The cost of using fungicides, pesticides or herbicides is high - extensive uses of pesticides pollutes the environment	1 1 1 1 1 1 1 1 1 1 1 1 1 [10 m]
TOTAL			20

PAPER 3

SECTION A [33 MARKS]

1 (a) [KB0603 – Measuring Using Number]

Score	Criteria
3	Able to measure and record the time taken for methylene blue solution to decolourise (minutes) in Table 1 correctly: **Sample answer:** Water sample: Drain water – 22; River water – 37; Pond water – 58
2	Able to measure and record **2** Time taken for the methylene blue solution to decolourise (minutes) correctly
1	Able to count and record **1** Time taken for the methylene blue solution to decolourise (minutes) correctly
0	No response or wrong response.

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1 (b) (i) [KB0601 – Observation]

Score	Criteria
3	Able to state **any two** observations correctly according to 2 criteria: - Water sample [Manipulated Variable] - Time taken for the methylene blue solution to decolourise (minutes) [Responding Variable] **Sample answers:** [Horizontal observation] - If drain water used, the time taken for methylene blue to decolourise is 22 minutes - If river water used, the time taken for methylene blue to decolourise is 37 minutes - If pond water used, the time taken for methylene blue to decolourise is 58 minutes [Vertical observation] - If drain water used, the time taken for methylene blue to decolourise is 22 minutes compare to others - If river water used, the time taken for methylene blue to decolourise is 37 minutes compare to others - If pond water used, the time taken for methylene blue to decolourise is 58 minutes compare to others
2	Able to state **any one** observation correctly. ***or*** Able to state **any two incomplete** observations (any 2 criteria) **Sample answers:** - If drain water used, the time taken for methylene blue to decolourise is shortess - If pond water used, the time taken for methylene blue to decolourise is is longest - If drain water used, the time taken for methylene blue to decolourise is faster compare to others - If pond water used, the time taken for methylene blue to decolourise is is the longest compare to others
1	Able to state **any one idea** of observation. (any 1 criteria) **Sample answers:** - The time taken for methylene blue to decolourise is different when use different water sample - When used drain water, the time taken for methylene blue to decolourises is shortest - When used pond water, the time taken for methylene blue to decolourises is the longest
0	Not able to response *or* wrong response.

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1 (b) (ii) [KB0604 – Making inference]

Score	Criteria
3	Able to make **one logical inference** for each observation based on the criteria - Oxygen content - Level of pollution **Sample answers:** [Horizontal inference] - Because drain water contains less oxygen so it is the most polluted - Because river water contains less oxygen so it is polluted - Because pond water contains more oxygen so it is less polluted. [Vertical inference] - Because drain water contain less oxygen so it is the most polluted compare to other water samples. - Because river water contain less oxygen so it is polluted compare to pond water - Because the pond water contain more oxygen so it is the less polluted compare to others
2	Able to make **one logical inference** for any one observation**.** *or* Able to make **one logical** and **incomplete inference** base on one criterion for each observation. **Sample answer:** - Different water sample have different level of pollution - Different water sample contain different amount of dissolved oxygen, so the level of pollutions different. - More oxygen in the water sample, the less polluted it is. - Less oxygen in the water sample, the more polluted it is. - Level of water pollution depends on the dissolved oxygen in it.
1	Able to make an **idea** of inference with one criterion. **Sample answers** - Drain water is polluted - Pond water is polluted less. - All waters are polluted. - Or any other suitable answer
0	Not able to response *or* wrong response.

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1(c) [KB061001 – Controlling Variables]

- All 6 ticks >> 3 m
- 4 – 5 ticks >> 2 m
- 2 – 3 ticks >> 1 m
- 0 – 1 tick >> 0 m

Variables	How the variables are operated
Manipulated: Water sample	Use water sample from different sources Use three different water sample Change the water sample used
Responding: Time taken for the methylene blue to decolourise (minutes)	Measure and record the time taken for the methylene blue to decolourise when exposed to 100 ml of different water sample by using stopwatch
Fixed: Volume of water sample / volume of methylene blue solution (ml)	Maintain the volume of water sample at 100 ml Use fix volume of methylene blue solution

1(d) KB0611- Making Hypothesis]

Score	Criteria
3	Able to state a hypothesis to show a relationship between the manipulated variable and responding variable and the hypothesis can be validated, based on 3 criteria: - Manipulated variable - Responding variable - Relationship **Sample answer** : - The longer the time taken for methylene blue to decolorise, the less polluted the water sample. - The shorter the time taken for methylene blue to decolorise, the more polluted the water sample
2	Able to state less accurate hypothesis to show a relationship between manipulated variable and responding variable base on 2 criteria. **Sample answer** - Different time taken for methylene blue to decolorise, the different the level of water polluted.

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	- Level of water pollution depends on the time taken for methylene blue to decolorise.
1	Able to state an idea of hypothesis to show a relationship between manipulated variable and responding variable base on 1 criterion. **Sample answer** - The time taken for methyele blue solution to decolorise is varied. - Different water sample have different level of pollution.
0	Not able to response *or* wrong response.

1(e) (i) [KB0606 – Communicating]

Score	Criteria
3	Able to draw and fill a table with all columns and rows labeled with complete unit **Sample answer** Water sample | Time taken for methylene blue blue solution to decolorise (minutes) | Level of water pollution Drain water | 22 | 1 River water | 37 | 2 Pond water | 58 | 3
2	Able to draw a table with incomplete data
1	Able to draw a table without data
0	Not able to response *or* wrong response.

1(e) (ii) [KB0607 – Space and time relationship]

Score	Criteria
3	Able to draw a bar chart with 3 criteria: - A(axis): correct title with unit and uniform scale - P (point) : transferred correctly - S (Shape): able to joint all points, smooth graph, a bell shape.
2	Able to plot a graph with any 2 criteria
1	Able to plot a graph with any 1 criteria
0	Not able to response *or* wrong response.

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1 (f) [KB0608 – Interpreting Data]

Score	Criteria
3	Able to state clearly and accurately the relationship between the time taken for the methylene blue solution to decolorise and the level of water pollution. criteria: P1 – between the time taken for the methylene blue solution to decolorise P2 – the level of water pollution **Sample answer:** ***(Associates each of the condition with the level of water pollution)*** - The drain water is the most polluted because the time taken for the methylene blue solution to decolorise is the shortest. - The pond water is the less polluted because the time taken for the methylene blue solution to decolorise is the longest. - River water is polluted because the time taken for the methylene blue solution to decolourise is the longer
2	Able to state clearly but less accurate the relationship between the time taken for the methylene blue solution to decolorise with the level of water pollution **Sample answer:** - Drain water is most polluted because the time for methylene blue solution become colorless the shortest. - Pond water is less polluted because the time for the methylene blue solution become colorless is the longest - River water is polluted because the time for methylene blue become colouress is longer
1	Able to state the idea of the relationship **Sample answer** - Different water sample have different time taken to decolorise the methyele blue solution - Different water sample have different level of pollution. - Water sample affect the time taken for methyelene blue solution to decolorise.
0	Not able to response *or* wrong response.

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1 (g) [KB0605 – Predicting]

Score	Criteria
3	Able to predict the result accurately base on 2 criteria. - Expected time taken for the methylene blue solution decolorise - The reason of the answer - Level of water pollution **Sample answer:** P1 – Time taken for the methylene blue solution decolorise become shorter than 22 minutes P2 – Because more oxygen from atmosphere was dissolved in the solution P3 – Drain water become less polluted
2	Able to predict the result less accurate base on 1 criteria **Sample answer:** The time taken for the methylene blue solution decolorise become shorter because the more oxygen found in the water sample
1	Able to give idea of the result **Sample answer:** Time taken for the methylene blue solution decolorise become shorter
0	Not able to response *or* wrong response.

1 (h) [KB0609] [Define operationally]

Score	Criteria
3	Able to explain the level of water pollution operationally base on 3 criteria: - Time taken for methylene blue solution to decolorise - The level of water pollution - The water sample **Sample answer** The level of water pollution is the time taken for methylene blue to decolorise, the shortest the time taken the higher the level of water pollution.
2	Able to state the abiotic factor base on 2 criteria. **Sample answer:** The level of water pollution is the time taken for methylene blue to decolorise

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1	Able to state the idea of the level of water pollution **Sample answer:** The time taken for methylene blue to docolorise shows the level of water pollution
0	Not able to response *or* wrong response.

1 (i) [KB0602 – Classifying]

Score	Criteria
3	Able to classify all 5 listed objects into apparatus and material Apparatus: Stop watch; Syringe; Measuring cylinder Material: Water sample; 0.1% Methylene blue solution
2	Able to classify 2 apparatus and 2 materials
1	Able to classify 1 apparatus and 1 material
0	Not able to response *or* wrong response.

SECTION B [17 MARKS]

KB 1201 – Identifying Problem

Marking Criteria	Score
Able to write problem statement correctly base on 3 criteria: - Manipulated variables –(Food samples) - Responding variable – (Energy content) - Question form (?) **Sample answer:** - How does the difference food sample affect the energy content? - Does the difference food sample affect the energy content? - Does the dried coconut flake contain the highest energy value?	3
Able to write a problem statement base on 2 criteria only **Sample answer:** Different food sample affect the energy value. (not in question form) Which food sample contains the highest energy value?	2
Able to write a problem statement base on 1 criterion only / idea **Sample answer:**	1

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Is the food sample affects the energy value? (Just yes or no) To investigate the energy value in food sample (No P1)	
Wrong or no response	0

KB061202 – Making Hypothesis

Marking Criteria	Marks
Able to write a suitable hypothesis correctly base on the 3 criteria: - Manipulated variable - Responding variable - Relationship **Sample answer:** - The higher the increase of temparature of 20 ml water, the higher the energy content in the food sample when the food sample burnt completely. - If the increase in temperature of 20 ml of water higher, the energy content of the food sample is higher when the food sample burnt completely. - As the temperature of 20 ml of water increase higher, the energy content in the food sample is higher when the food sample burnt completely. - (wrong hypothesis is accepted)	3
Able to write correct hypothesis but consist of 2 criteria only **Sample answer:** Different food sample contain different energy value.	2
Able to give an idea about the problem statement. **Sample answer:** Difference food sample effect the energy value.	1
Wrong or no response	0

KB061201 – Variables

Marking Criteria	Marks
Able to identify all the three variables correctly. **Sample answer:** Manipulated variable : The type of food sample Responding variable: The increase in temperature of 20 ml of water when the food sample burnt completely (°C) Controlled variable: Volume of water (20 ml)	3
Able to write any two of the variables correctly	2

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Able to write one of the variable correctly	1
Wrong or no response	0

KB061205 – Materials and Apparatus

Marking Criteria	Marks
Able to list all materials and apparatus needed to carry out the experiment successfully. **Sample answer:** Materials (M): food sample, distilled water, plasticine. Apparatus (A): Retort stand, thermometer, neddle, boiling tube, matches, electronic balance 3M + 6A	3
2M + 4A	2
1M + 1-2 A	1
If no M	0

KB061204 – Procedure

Marking Criteria	Marks
Able to write all the steps in carrying out the experiment successfully. K1: Steps to set up the apparatus K2: Steps to handle the fixed variable K3: Steps to handle the manipulated variable K4: Steps to handle the responding variable K5: Precautionary steps/steps to get accurate results / readings.	
3 K1 + 1K2+1K3 +1K4 +1K5	3
Any 3 – 4 K	2
Any 2 K	1
1K or wrong response	0

Sample answer for procedure:

No.	Procedure	K's
1	The students able to shows the set up of the apparatus clearly	K1
2	The students able to use the wind shield to avoid the heat loss	K5
3	Measure the mass of the food samples and pin up with the needdle and food the needle onto the plastecine.	K3/K1
4	Measure 20 ml of distilled water pour into boiling tube	K1/K2
5	Able to state the precautionary action / steps to get the accurate result	K5
6	The increase in temperature was measured when each food sample burnt completely	K4
7	Repeat step 4 and 5	K4

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8	The increase in temperature caused by all food sample when it was burnt completely was recorded	K2/K4
9	Calculate the amount of energy value in each food sample by using a formula $\text{Enery value} = \frac{42 \times 20 \times \text{Rise in temperature of water}}{\text{mass of food sample}}$	K3/K4

<table>
<tr><th>Marking Criteria</th><th>Marks</th></tr>
<tr><td>Able to draw a complete table to record the relevant data base on the 3criteria:

- Type of food sample
- Increase in temperature of 20 ml of distilled water when the food sample burnt completely
- The units in ml or cm^3

Sample answer:

<table>
<tr><th rowspan="2">Type of food sample</th><th colspan="2">Temperature of 20 ml of distilled water (°C)</th><th rowspan="2">Increase in temperature</th></tr>
<tr><td>Initial</td><td>Final</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>
</td><td>2</td></tr>
<tr><td>Able to draw a complete table to record the relevant data without total volume produced / one of the title have no unit</td><td>1</td></tr>
<tr><td>Wrong answer or both titles have no units.</td><td>0</td></tr>
</table>

END OF MARKING SCHEME
PERATURAN PEMARKAHAN TAMAT

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