

SPM EXAMINATION PAPER 2013

PAPER 1

Time: 1 hour 15 minutes

This question paper consists of 50 questions. Answer all questions.
Kertas soalan ini mengandungi 50 soalan. Jawab semua soalan.

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

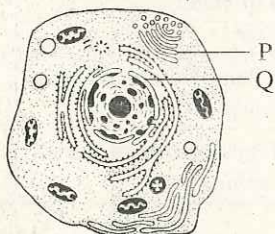


Diagram 1
Rajah 1

What are P and Q?
Apakah P dan Q?

	P	Q
A	Golgi apparatus Jasad Golgi	Mitochondrion Mitokondrion
B	Golgi apparatus Jasad Golgi	Nucleus Nukleus
C	Ribosome Ribosom	Nucleus Nukleus
D	Ribosome Ribosom	Mitochondrion Mitokondrion

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

- Contains hydrolytic enzymes
Mengandungi enzim hidrolitik
- Digests complex organic molecule and excretes worn out organelles
Mencernakan molekul organik kompleks dan menyingkirkan organel yang tidak digunakan lagi

What is organelle X?
Apakah organel X?

- A Lysosome / Lisosom
B Ribosome / Ribosom

- C Golgi apparatus / Jasad Golgi
D Smooth endoplasmic reticulum
Jalinan endoplasma licin

- 3 What is the effect to the cell if there is no smooth endoplasmic reticulum?
Apakah kesan ke atas sel sekiranya tidak terdapat retikulum endoplasma licin?

- A No production of energy
Tiada penghasilan tenaga
B No synthesis of lipids
Tiada sintesis lipid
C No synthesis of protein
Tiada sintesis protein
D No modification of protein
Tiada modifikasi protein

- 4 Diagram 2 shows cell organisation in human.
Rajah 2 menunjukkan organisasi sel dalam manusia.

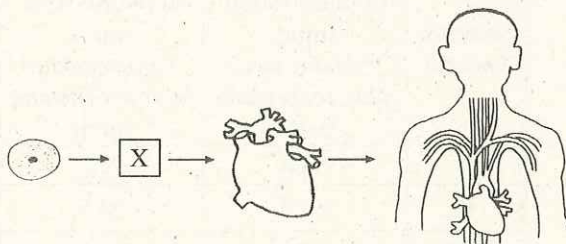
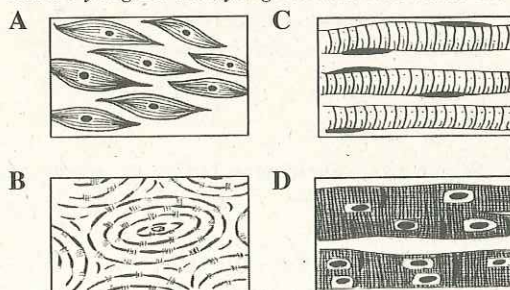


Diagram 2
Rajah 2

Which of the following represents X?
Antara yang berikut, yang manakah mewakili X?



- 5 What happens to erythrocytes when immersed in distilled water?

Apakah yang berlaku kepada eritrosit apabila direndam dalam air suling?

- A Burst
Meletus
B Turgid
Segah
C Flaccid
Flasid
D Crenation
Krenasi

- 6 Distilled water diffuses into potato strip and causes it to increase in mass.

What is the process involved?

Air suling meresap masuk ke dalam jalur ubi kentang dan menyebabkan pertambahan jisim.

Apakah proses yang terlibat?

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

- 7 Table 1 shows the initial and final length of potato strips after being immersed in different concentration of sucrose solution.

Jadual 1 menunjukkan panjang awal dan panjang akhir jalur ubi kentang selepas direndam dalam larutan sukrosa yang berbeza kepekatan.

Solution Larutan	Initial length of potato strip (mm) Panjang awal jalur ubi kentang (mm)	Final length of potato strip (mm) Panjang akhir jalur ubi kentang (mm)
P	50.0	50.0
Q	50.0	50.5
R	50.0	51.0
S	50.0	49.0

Table 1
Jadual 1

Which solution is a hypertonic solution?
Larutan manakah adalah larutan hipertonik?

- A P
B Q
C R
D S

- 8 Which group of elements builds up carbohydrates?
Kumpulan unsur manakah yang membina karbohidrat?

- A Carbon, oxygen, nitrogen
Karbon, oksigen, nitrogen

- B Carbon, oxygen, hydrogen
Karbon, oksigen, hidrogen
C Carbon, phosphorus, nitrogen
Karbon, fosforus, nitrogen
D Carbon, hydrogen, phosphorus
Karbon, hidrogen, fosforus

- 9 Table 2 shows the result of an experiment to determine the energy value of a cashew nut.
Jadual 2 menunjukkan keputusan eksperimen untuk menentukan nilai tenaga dalam kacang gajus.

Mass of cashew nut Jisim kacang gajus	0.8 g
Mass of water Jisim air	20.0 g
Initial temperature of water Suhu awal air	28 °C
Final temperature of water Suhu akhir air	45 °C

Table 2
Jadual 2

Calculate the energy value of the cashew nut.
[Specific heat capacity of water = $4.2 \text{ Jg}^{-1} \text{ } ^\circ\text{C}^{-1}$]
Hitung nilai tenaga kacang gajus tersebut.

- [Muatan haba tentu air = $4.2 \text{ Jg}^{-1} \text{ } ^\circ\text{C}^{-1}$]
A 1.79 kJg^{-1}
B 2.86 kJg^{-1}
C 2.94 kJg^{-1}
D 4.73 kJg^{-1}

- 10 Which phase of mitosis shows early formation of cell plate in a plant cell?

Fasa mitosis manakah yang menunjukkan pembentukan awal plat sel dalam sel tumbuhan?

- A Prophase
Profasa
B Metaphase
Metafasa
C Anaphase
Anafasa
D Telophase
Telofasa

- 11 Diagram 3 shows a process in a phase of cell division.

Rajah 3 menunjukkan proses dalam satu fasa pembahagian sel.

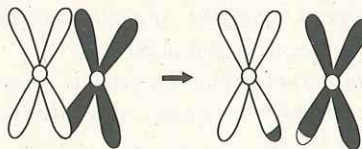


Diagram 3
Rajah 3

What phase does this process occur?
Pada fasa manakah proses ini berlaku?

- A Metaphase I
Metafasa I
- B Metaphase II
Metafasa II
- C Prophase I
Profasa I
- D Prophase II
Profasa II

- 12 Diagram 4 shows a cell division in the reproductive organ of an animal.

Rajah 4 menunjukkan pembahagian sel dalam organ pembiakan seekor haiwan.

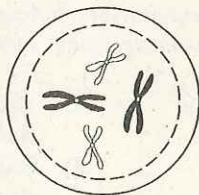
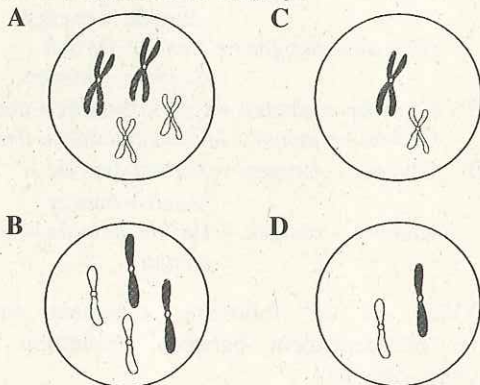


Diagram 4
Rajah 4

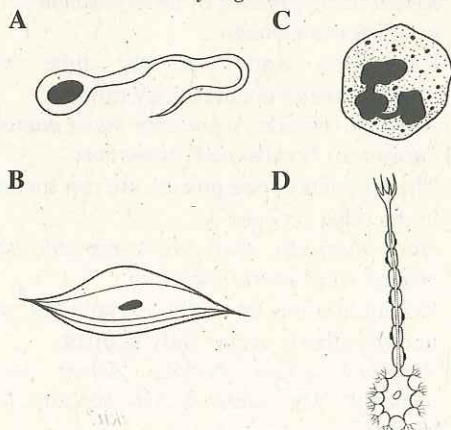
Which diagram represents the gamete cell after the cell division is completed?

Rajah manakah yang mewakili sel gamet setelah pembahagian sel itu lengkap?



- 13 Which of the following cells is a product of meiosis?

Antara sel berikut yang manakah hasil meiosis?



- 14 Which of the following shows the differences of alimentary canal between ruminant and rodent?
Antara yang berikut, yang manakah menunjukkan perbezaan salur pencernaan alimentari antara haiwan ruminan dengan haiwan rodensia?

	Ruminant Ruminan	Rodent Rodensia
I	Have a large caecum Mempunyai sekum yang besar	Have no caecum Tidak mempunyai sekum
II	Have no caecum Tidak mempunyai sekum	Have a large caecum Mempunyai sekum yang besar
III	One chamber of stomach Satu ruang perut	Four chambers of stomach Empat ruang perut
IV	Four chambers of stomach Empat ruang perut	One chamber of stomach Satu ruang perut

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

- 15 Table 3 shows the nutrient content in different types of food for a child.

Jadual 3 menunjukkan kandungan nutrien dalam jenis makanan yang berbeza untuk kanak-kanak.

Type of food Jenis makanan	Ferum Ferum (mg /100g)	Calcium Kalsium (mg /100g)	Vitamin C Vitamin C (mg /100g)	Vitamin D Vitamin D (mg /100g)
Banana Pisang	0.4	7	10	0
Fish Ikan	0.4	35	0	6.3
Nuts Kecacang	7.6	35	0	0
Milk Susu	0.1	120	0.5	0.02

Table 3
Jadual 3

Which food in the table are the best for healthy growth of bones and teeth?

Makanan manakah di dalam jadual itu yang paling baik untuk pertumbuhan tulang dan gigi yang sihat?

- A Banana and milk
Pisang dan susu
- B Banana and nuts
Pisang dan kekacang
- C Fish and nuts
Ikan dan kekacang
- D Fish and milk
Ikan dan susu

16 What is the effect of insufficient intake of fibre in a person's daily diet?
Apakah kesan kekurangan pengambilan serat dalam diet harian seseorang itu?

- A Indigestion
Ketidakcernaan
- B Dehydration
Pendehidratian
- C Constipation
Sembelit
- D Gastric ulcer
Ulser gaster

17 Which condition causes the highest rate of photosynthesis?
Keadaan manakah yang menyebabkan kadar fotosintesis paling tinggi?

	Carbon dioxide concentration (%) <i>Kepekatan karbon dioksida (%)</i>	Temperature (°C) <i>Suhu (°C)</i>
A	0.04	35
B	0.04	25
C	0.01	35
D	0.01	25

18 Diagram 5 shows longitudinal section of a part of stomach wall.
Rajah 5 menunjukkan keratan memanjang sebahagian daripada dinding perut.

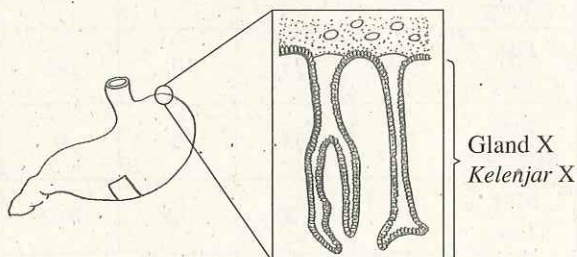


Diagram 5
Rajah 5

What happens if gland X is malfunction?

Apakah yang akan berlaku jika kelenjar X tidak berfungsi?

- A Produces more mucus
Menghasilkan lebih banyak mukus
- B Slows the activity of pepsin
Memperlakan aktiviti pepsin
- C Stops the growth of bacteria in food
Menghentikan pertumbuhan bakteria dalam makanan
- D Stops the activity of salivary amylase
Menghentikan aktiviti amilase liur

19 Which organism practises holozoic nutrition?
Organisma manakah yang menjalankan nutrisi holozoik?

- A Mushroom
Cendawan
- B Rafflesia
Rafflesia
- C Bacteria
Bakteria
- D Rabbit
Arnab

20 Which equation represents aerobic respiration?
Persamaan manakah yang mewakili respirasi aerobik?

- A Glucose → lactic acid + energy
Glukosa → asid laktik + tenaga
- B Glucose + oxygen → ethanol + carbon dioxide + energy
Glukosa + oksigen → etanol + karbon dioksida + tenaga
- C Glucose → ethanol + carbon dioxide + energy
Glukosa → etanol + karbon dioksida + tenaga
- D Glucose + oxygen → carbon dioxide + water + energy
Glukosa + oksigen → karbon dioksida + air + tenaga

21 Which of the following statement shows the interdependent between respiration and photosynthesis?
Antara pernyataan berikut, yang manakah menunjukkan saling bersandaran antara respirasi dan fotosintesis?

- A Both processes use and release energy
Kedua-dua proses menggunakan dan membebaskan tenaga
- B Respiration occurs all the time while photosynthesis occurs at day time
Respirasi berlaku sepanjang masa manakala fotosintesis berlaku pada siang hari
- C The products of one process are raw materials in the other process
Hasil daripada satu proses menjadi bahan mentah untuk proses yang lain
- D Respiration occurs only in animals while photosynthesis occurs only in plant
Respirasi hanya berlaku dalam haiwan manakala fotosintesis hanya berlaku dalam tumbuhan

- 22 Lactic acid accumulated in an athlete's muscles after taking part in 100 m sprint.

Which of the following contribute to the situation?
Asid laktik terkumpul di dalam otot seorang atlet selepas mengambil bahagian dalam 100 m lari pecut. Antara berikut yang manakah menyumbang kepada situasi tersebut?

- A Anaerobic respiration in muscles increases
Respirasi anaerobik di dalam otot meningkat
 B Anaerobic respiration in muscles decreases
Respirasi anaerobik di dalam otot menurun
 C Aerobic respiration in muscles increases
Respirasi aerobik di dalam otot meningkat
 D Aerobic respiration in muscles decreases
Respirasi aerobik di dalam otot menurun

- 23 Diagram 6 shows a longitudinal section of an alveolus and blood capillary.

Rajah 6 menunjukkan keratan memanjang bagi satu alveolus dan kapilari darah.

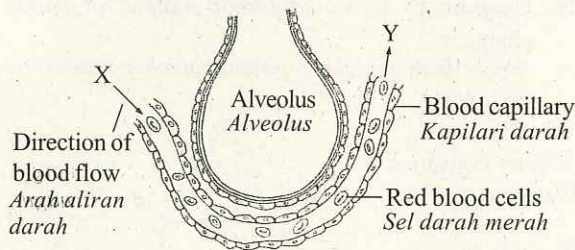


Diagram 6
Rajah 6

What is the partial pressure of carbon dioxide at X and Y?

Apakah tekanan separa bagi karbon dioksida pada X dan Y?

	X	Y
A	Low <i>Rendah</i>	Low <i>Rendah</i>
B	Low <i>Rendah</i>	High <i>Tinggi</i>
C	High <i>Tinggi</i>	Low <i>Rendah</i>
D	High <i>Tinggi</i>	High <i>Tinggi</i>

- 24 The following statements show a person's responses in a certain situation.

Pernyataan berikut menunjukkan gerak balas seseorang dalam suatu situasi tertentu.

- Heartbeat rate increases
Kadar denyutan jantung meningkat
- Breathing rate increases
Kadar pernafasan meningkat
- Adrenaline produced increases
Penghasilan adrenalina meningkat

Which situation is related to the response?

Situasi manakah yang berkaitan dengan gerak balas tersebut?

Which situation is related to the response?

- A Cycling across the country
Berbasikal merentasi desa
 B Rafting along steep rapids
Berakit menyusuri jeram yang curam
 C Running across the field
Berlari merentasi padang
 D Singing in a party
Menyanyi dalam majlis

- 25 Diagram 7 shows relationship between two processes.

Rajah 7 menunjukkan hubungan antara dua proses.

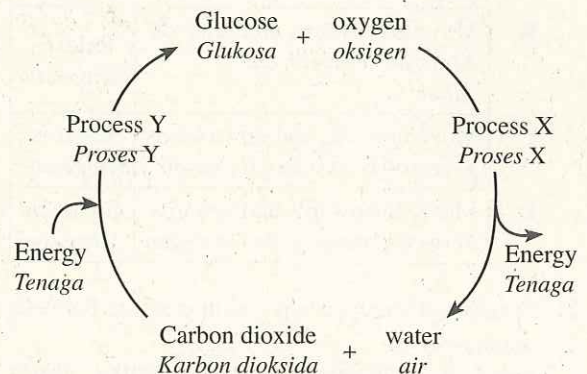


Diagram 7
Rajah 7

What are X and Y?

Apakah X dan Y?

	Process X <i>Proses X</i>	Process Y <i>Proses Y</i>
A	Condensation <i>Kondensasi</i>	Hydrolysis <i>Hidrolisis</i>
B	Condensation <i>Kondensasi</i>	Photosynthesis <i>Fotosintesis</i>
C	Respiration <i>Respirasi</i>	Photosynthesis <i>Fotosintesis</i>
D	Respiration <i>Respirasi</i>	Condensation <i>Kondensasi</i>

- 26 Diagram 8 shows part of human respiratory system.
Rajah 8 menunjukkan sebahagian daripada sistem respirasi manusia.

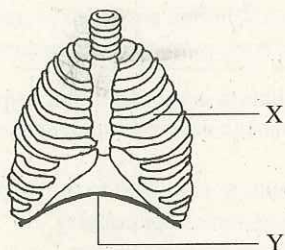


Diagram 8
Rajah 8

What happen to structures X and Y during exhalation?

Apakah yang berlaku kepada struktur X dan Y semasa menghembus nafas?

	X	Y
A	Move upwards and downwards <i>Bergerak ke atas dan ke bawah</i>	Contracts <i>Mengecut</i>
B	Move downwards and inwards <i>Bergerak ke bawah dan ke dalam</i>	Relaxes <i>Mengendur</i>
C	Move upwards and downwards <i>Bergerak ke atas dan ke bawah</i>	Relaxes <i>Mengendur</i>
D	Move downwards and inwards <i>Bergerak ke bawah dan ke dalam</i>	Contracts <i>Mengecut</i>

- 27 Diagram 9 shows a type of interaction between organisms.
Rajah 9 menunjukkan sejenis interaksi antara organisma.



Diagram 9
Rajah 9

What is the interaction?
Apakah interaksi tersebut?

- A Mutualism
Mutualisme

- B Parasitism
Parasitisme
C Saprophytism
Saprofitisme
D Commensalism
Komensalisme

- 28 Which of the following can be used to prevent the infection of hepatitis?

Antara berikut yang manakah boleh digunakan untuk mencegah jangkitan hepatitis?

- A Vaccine
Vaksin
B Antiseptics
Antiseptik
C Antibiotics
Antibiotik
D Disinfectants
Disinfektan

- 29 Diagram 10 shows a pyramid number of a food chain.

Rajah 10 menunjukkan piramid nombor satu rantai makanan.

Tertiary consumer
Pengguna tertier

Secondary consumer
Pengguna sekunder

Primary consumer
Pengguna primer

Producers
Pengeluar

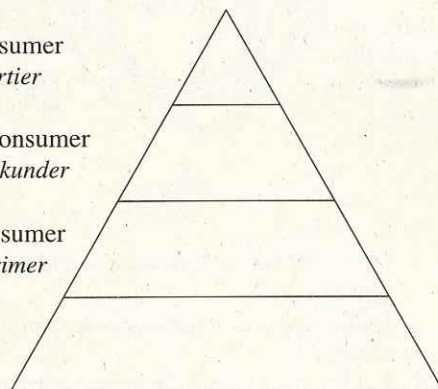


Diagram 10
Rajah 10

Which of the following has the lowest energy value?

Antara berikut yang manakah mempunyai nilai tenaga yang paling rendah?

- A Producers
Pengeluar
B Primary consumer
Pengguna primer
C Secondary consumer
Pengguna sekunder
D Tertiary consumer
Pengguna tertier

- 30 Table 4 shows the population of *Paramecium aurelia* and *Paramecium caudatum* which are cultured in the same flask for a certain period of time.

Jadual 4 menunjukkan populasi *Paramecium aurelia* dan *Paramecium caudatum* yang dikultur di dalam kelalang yang sama untuk suatu tempoh masa tertentu.

Time (day) Masa (hari)	0	1	2	3	4	5	6	7
Number of <i>Paramecium aurelia</i> Bilangan <i>Paramecium aurelia</i>	2	4	20	40	78	120	130	140
Number of <i>Paramecium caudatum</i> Bilangan <i>Paramecium caudatum</i>	2	4	11	20	32	26	14	10

Table 4
Jadual 4

Which statement is correct about the interaction?
Pernyataan manakah yang betul tentang interaksi itu?

- A *Paramecium aurelia* is a succesful species
Paramecium aurelia adalah spesies yang berjaya
- B *Paramecium caudatum* is a succesful species
Paramecium caudatum adalah spesies yang berjaya
- C Both *Paramecium aurelia* and *Paramecium caudatum* are successful species
Kedua-dua *Paramecium aurelia* dan *Paramecium caudatum* adalah spesies yang berjaya
- D Both *Paramecium aurelia* and *Paramecium caudatum* have the same adaptation for survival
Kedua-dua *Paramecium aurelia* dan *Paramecium caudatum* mempunyai adaptasi yang sama untuk kemandirian
- 31 Which adaptation is found on mangrove plants to survive in a water logged condition?
Adaptasi manakah yang terdapat pada tumbuhan paya bakau untuk hidup dalam keadaan air bertakung?

- A Hydathodes on the surface of the leaves
Hidatod pada permukaan daun

- B Thick and succulent leaves
Daun yang tebal dan sukulen
- C Thin and vertical pneumatophores
Pneumatofor halus dan tegak
- D High osmotic pressure of the root cells
Tekanan osmotik yang tinggi pada sel akar

- 32 The following statements are the characteristics of a phenomenon.
Pernyataan berikut adalah ciri-ciri bagi satu fenomena.

- Biochemical oxygen demand (BOD) increases
Keperluan oksigen secara biokimia (BOD) meningkat
- Algal bloom
Pertumbuhan pesat alga
- Light intensity reduced
Keamatan cahaya berkurang

What is the phenomenon?

Apakah fenomena itu?

- A Acid rain
Hujan asid
- B Eutrophication
Eutrofikasi
- C Ozone depletion
Penipisan ozon
- D Green house effect
Kesan rumah hijau

- 33 Diagram 11 shows activities that cause a phenomenon.
Rajah 11 menunjukkan aktiviti-aktiviti yang menyebabkan suatu fenomena.

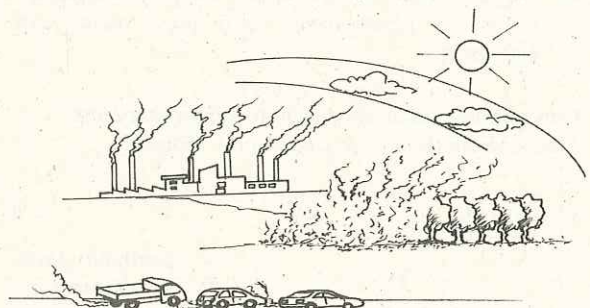


Diagram 11
Rajah 11

What is the phenomenon and the gas involved?
Apakah fenomena itu dan gas yang terlibat?

	Phenomenon <i>Fenomenon</i>	Gas <i>Gas</i>
A	Thinning of ozone layer <i>Penipisan lapisan ozon</i>	Carbon dioxide <i>Karbon dioksida</i>
B	Thinning of ozone layer <i>Penipisan lapisan ozon</i>	Chlorofluorocarbon <i>Klorofluorokarbon</i>
C	Green house effect <i>Kesan rumah hijau</i>	Carbon dioxide <i>Karbon dioksida</i>
D	Green house effect <i>Kesan rumah hijau</i>	Chlorofluorocarbon <i>Klorofluorokarbon</i>

- 34 Diagram 12 shows human blood vessel.
Rajah 12 menunjukkan salur darah manusia.

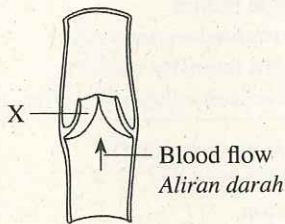


Diagram 12
Rajah 12

What happens if structure X is not functioning?
Apakah yang berlaku jika struktur X tidak berfungsi?

- A Blood flow increases
Aliran darah meningkat
B Blood pressure increases
Tekanan darah meningkat
C Blood flows in one direction
Darah mengalir dalam satu arah
D Blood flows backwards
Darah mengalir balik
- 35 Diagram 13 shows a graph of a type of immunity.
Rajah 13 menunjukkan graf bagi suatu jenis keimunan.

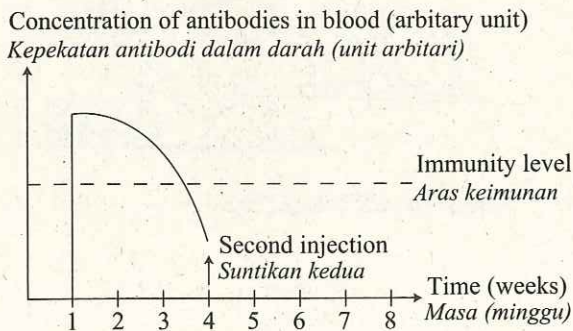
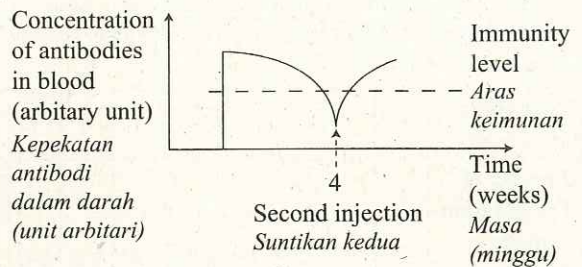


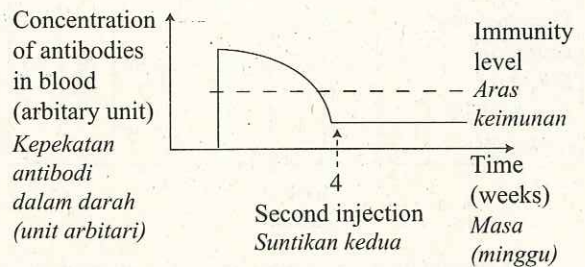
Diagram 13
Rajah 13

Which graph shows the concentration of antibodies after the second injection?
Graf manakah yang menunjukkan kepekatan antibodi selepas suntikan kedua?

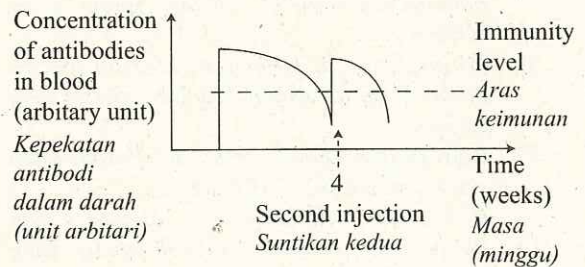
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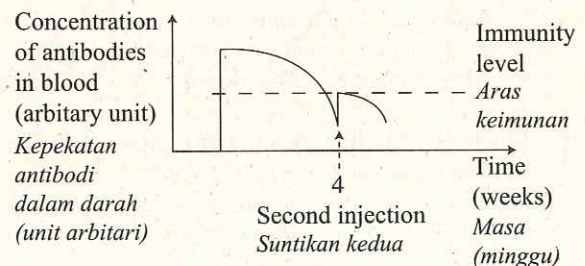
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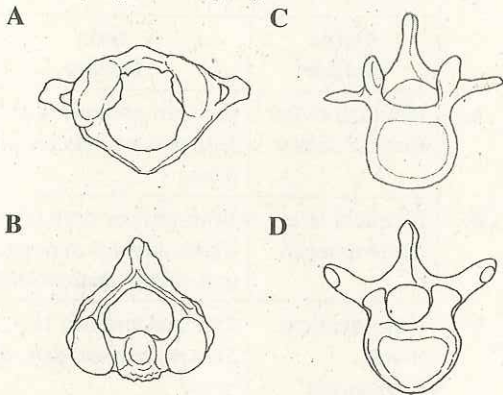
C



D



- 36 Which of the following is a thoracic vertebra?
Antara yang berikut, yang manakah vertebra toraks?



- 37 The normal blood glucose level is 90 mg/100 cm³. If the blood glucose level is more than the normal value, hormone X is secreted. If the blood glucose level is less than normal value, hormone Y is secreted.

What is hormone X and hormone Y?

Aras glukosa darah yang normal ialah 90 mg/100 cm³. Jika aras glukosa darah melebihi nilai normal, hormon X dirembeskan. Jika aras glukosa darah kurang daripada nilai normal, hormon Y dirembeskan.

Apakah hormon X dan hormon Y?

	X	Y
A	Insulin Insulin	Glucagon Glukagon
B	Glucagon Glukagon	Adrenaline Adrenalina
C	Adrenaline Adrenalina	Glucagon Glukagon
D	Adrenaline Adrenalina	Insulin Insulin

- 38 Diagram 14 shows the cross section of a synapse.
Rajah 14 menunjukkan keratan rentas sinaps.

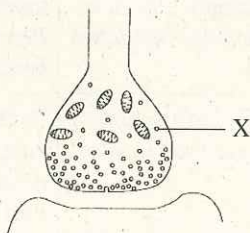


Diagram 14
Rajah 14

What is the function of X?

Apakah fungsi X?

- A Produces energy
Menghasilkan tenaga
B Produces impuls
Menghasilkan impuls
C Produces hormones
Menghasilkan hormon
D Produces neurotransmitter
Menghasilkan neurotransmitter

- 39 Which hormone is secreted by adrenal gland?
Hormon manakah yang dirembeskan oleh kelenjar adrenal?

- A Insulin
Insulin
B Glucagon
Glukagon
C Aldosterone
Aldosteron
D Progesterone
Progesteron

- 40 Diagram 15 shows an endocrine gland.
Rajah 15 menunjukkan kelenjar endokrin.

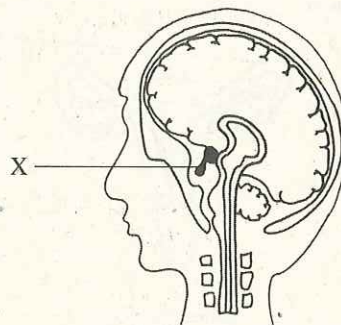


Diagram 15
Rajah 15

What will happen if X is malfunction?

Apakah yang akan berlaku sekiranya X gagal berfungsi?

- A Metabolic rate decreases
Kadar metabolisma menurun
B Fatty acid in blood decreases
Asid lemak dalam darah berkurang
C Water reabsorption by kidneys decreases
Penyerapan semula air oleh ginjal berkurang
D Blood sugar level decreases
Aras gula darah berkurang

- 41 Which of the following is an internal stimulus of an organism?

Antara berikut yang manakah adalah rangsangan dalam bagi suatu organisma?

- A Light intensity / Keamatan cahaya
B Blood sugar level / Aras gula darah
C Music from a radio / Muzik dari radio
D Surrounding temperature / Suhu sekeliling

- 42 Diagram 16 shows the development of an organism.
Rajah 16 menunjukkan perkembangan bagi suatu organisma.

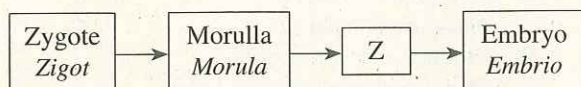


Diagram 16
Rajah 16

What is Z?
Apakah Z?

- A Foetus
Fetus
B Chorion
Korion
C Blastocyst
Blastosis
D Trophoblast
Trofoblas
- 43 Diagram 17 shows female reproductive system.
Rajah 17 menunjukkan sistem pembiakan perempuan.

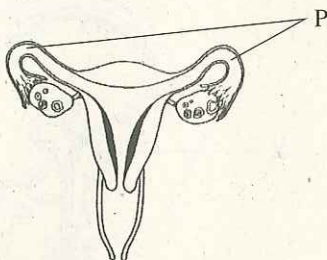


Diagram 17
Rajah 17

Which process can still occur if both P are tied and cut?

Proses manakah yang tetap berlaku jika kedua-dua P diikat dan dipotong?

- A Fertilisation
Persenyawaan
B Implantation
Penempelan
C Ovulation
Pengovulan
D Pregnancy
Kehamilan
- 44 Diagram 18 shows the formation of twins.
Rajah 18 menunjukkan pembentukan kembar.

Two embryo separate completely
Dua embrio berpisah dengan lengkap

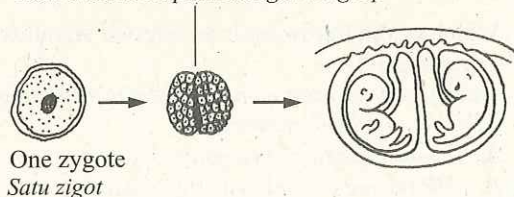


Diagram 18
Rajah 18

Which of the following is correct?

Antara yang berikut, yang manakah betul?

	Twins Kembar	Sex Jantina
A	Identical twins Kembar seiras	One girl and one boy Satu perempuan dan satu lelaki
B	Identical twins Kembar seiras	Both girls or both boys Kedua-duanya perempuan atau kedua-duanya lelaki
C	Non-identical twins Kembar tak seiras	One girl and one boy Satu perempuan dan satu lelaki
D	Non-identical twins Kembar tak seiras	Both girls or both boys Kedua-duanya perempuan atau kedua-duanya lelaki

- 45 Woman P has seven children and wants to limit the number of her children. Woman Q has been married for seven years and wants to have a child but failed to conceive.

Which of the following is most suitable for woman P and Q to use?

Wanita P mempunyai tujuh orang anak dan ingin menghadkan bilangan anaknya. Wanita Q telah berkahwin selama tujuh tahun dan ingin mempunyai anak tetapi gagal untuk hamil.

Antara berikut manakah cara yang paling sesuai untuk wanita P dan wanita Q gunakan?

	P	Q
A	Artificial insemination Permanian beradas	Depo-provera injection Suntikan Depo-provera
B	Intrauterine contraceptive device Alat kontraseptif dalam rahim	Artificial insemination Permanian beradas
C	In vitro fertilisation Persenyawaan in vitro	Intrauterine contraceptive device Alat kontraseptif dalam rahim
D	Depo-provera injection Suntikan Depo-provera	Diaphragm Diafragma

- 46 Diagram 19 shows a molecular structure.
Rajah 19 menunjukkan satu struktur molekul.

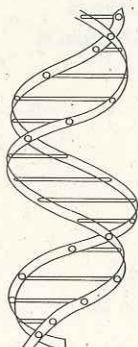


Diagram 19
Rajah 19

What is the structure?

Apakah struktur itu?

- | | |
|--------|--------------|
| A DNA | C Nucleotide |
| DNA | Nukleotida |
| B Gene | D Chromosome |
| Gen | Kromosom |

- 47 A person needs blood transfusion after an accident. He has antibody of anti-A and anti-B in his blood plasma.

Which blood group is suitable for him?

Seorang individu memerlukan pemindahan darah selepas mengalami kemalangan.

Dia mempunyai antibodi anti-A dan antibodi anti-B di dalam plasma darahnya.

Kumpulan darah manakah yang sesuai untuknya?

- | |
|--------------------------------------|
| A Blood group O / Kumpulan darah O |
| B Blood group AB / Kumpulan darah AB |
| C Blood group B / Kumpulan darah B |
| D Blood group A / Kumpulan darah A |

- 48 A woman with Rhesus negative married a man with heterozygous for Rhesus positive.

What is the probability to get Rhesus positive child?

Seorang wanita Rhesus negatif berkahwin dengan seorang lelaki heterozigos Rhesus positif.

Apakah kebarangkalian untuk mendapat anak Rhesus positif?

- | | |
|--------|--------|
| A 0.25 | C 0.75 |
| B 0.50 | D 1.00 |

- 49 Diagram 20 shows a pair of homologous chromosomes.

Rajah 20 menunjukkan sepasang kromosom homolog.

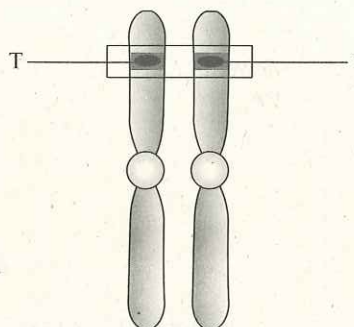


Diagram 20
Rajah 20

What is Tt?

Apakah Tt?

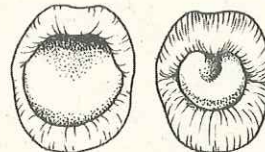
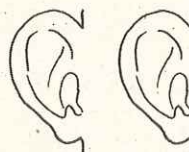
- | | |
|-------------|--------------|
| A Genotype | C Chromatin |
| Genotip | Kromatin |
| B Phenotype | D Chromosome |
| Fenotip | Kromosom |

- 50 Which of the following represent continuous variation?

Antara yang berikut, yang manakah mewakili variasi selanjur?

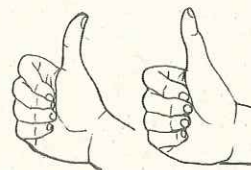
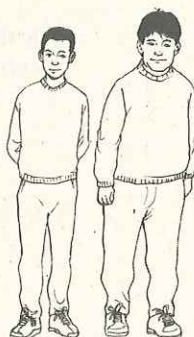
A

C



B

D



END OF QUESTION PAPER
KERTAS SOALAN TAMAT

This question paper consists of two sections: **Section A** and **Section B**.
Kertas soalan ini mengandungi dua bahagian: **Bahagian A** dan **Bahagian B**.

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 the formation of triglyceride.
Rajah 1.1 menunjukkan pembentukan trigliserida.

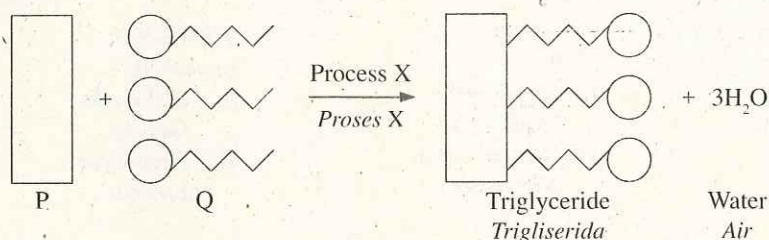


Diagram 1.1
Rajah 1.1

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

P:

Q:

[2 marks]
[2 markah]

- (ii) In Table 1, state the number of molecules for P and Q.
Dalam Jadual 1, nyatakan bilangan molekul bagi P dan Q.

Type of molecule Jenis molekul	Number of molecule Bilangan molekul
P	
Q	

Table 1
Jadual 1

[2 marks]
[2 markah]

- (b) (i) Name process X. / Namakan proses X.

.....

[1 mark]
[1 markah]

1(a)(i)

2

1(a)(ii)

2

1(b)(i)

1

- (ii) Explain process X.
Terangkan proses X.

.....

.....

.....

[2 marks]
[2 markah]

For
Examiner's
Use

1(b)(ii)

	2
--	---

- (c) Triglyceride is a type of lipid.
State **one** function of triglyceride in human.
Trigliserida adalah sejenis lipid.
Nyatakan **satu** fungsi trigliserida dalam manusia.

.....

[1 mark]
[1 markah]

1(c)

	1
--	---

- (d) Diagram 1.2 shows a cross-section of an artery in an individual who practices an unhealthy eating habit.
Rajah 1.2 menunjukkan satu keratan rentas arteri seorang individu yang mengamalkan tabiat pemakanan yang tidak sihat.

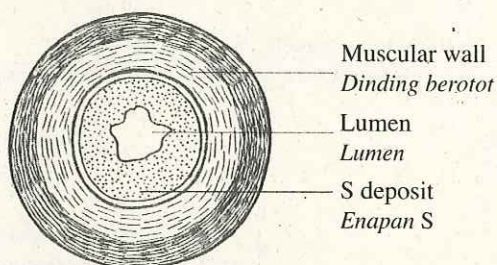


Diagram 1.2
Rajah 1.2

Explain the effect of the unhealthy eating habit to his health.
Terangkan kesan tabiat pemakanan yang tidak sihat terhadap kesihatannya.

Effect :
Kesan

Explanation :
Penerangan

.....

.....

[3 marks]
[3 markah]

1(d)

	3
--	---

- (e) Suggest **one** practice to avoid the formation of S deposit in the artery.
Cadangkan **satu** amalan untuk mengelakkan pembentukan enapan S dalam arteri.

.....

[1 mark]
[1 markah]

1(e)

	1
--	---

Total A1

	12
--	----

- 2 Diagram 2.1 shows the structure of animal cell.
Rajah 2.1 menunjukkan struktur sel haiwan.

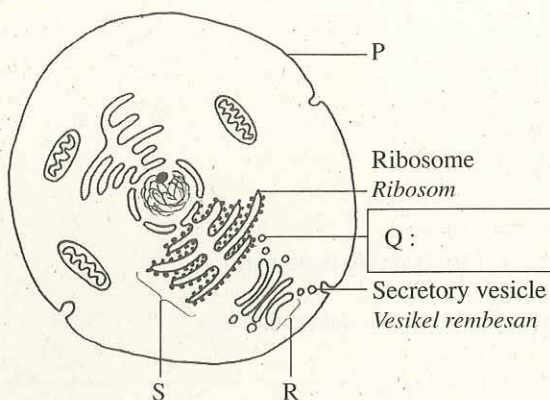


Diagram 2.1
Rajah 2.1

- (a) On Diagram 2.1, label Q.
Pada Rajah 2.1, labelkan Q.
- (b) Draw an arrow (→) to match organelle S to its function.
Lukis satu anak panah (→) untuk memadankan organel S kepada fungsinya.

[1 mark]
[1 markah]

Organelle
Organel

Function
Fungsi

S

- Transports synthesised proteins
Mengangkut protein yang telah disintesis
- Modifies synthesised proteins
Mengubahsuaikan protein yang telah disintesis
- Synthesises proteins
Mensintesis protein

[1 mark]
[1 markah]

- (c) Explain **one** characteristic of P.
Terangkan **satu** ciri P.

.....
.....

[2 marks]
[2 markah]

- (d) Describe the function of R in transporting extracellular enzyme.
Huraikan fungsi R dalam pengangkutan enzim luar sel.

.....
.....

[2 marks]
[2 markah]

- (e) Diagram 2.2 shows an organelle.
Rajah 2.2 menunjukkan satu organel.

For
Examiner's
Use

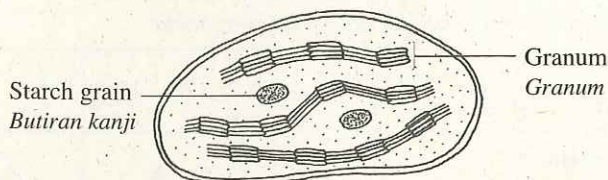


Diagram 2.2
Rajah 2.2

- (i) Explain why the organelle in Diagram 2.2 is not found in animal cell.
Terangkan mengapa organel dalam Rajah 2.2 tidak terdapat dalam sel haiwan.

[2 marks]
[2 markah]

2(e)(i)

	2
--	---

- (ii) Diagram 2.3 shows a longitudinal section of an onion bulb.
The onion bulb is planted in the soil.
Rajah 2.3 menunjukkan keratan memanjang suatu bebawang.
Bebawang itu ditanam di dalam tanah.

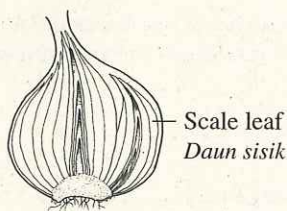


Diagram 2.3
Rajah 2.3

Explain why the organelle in Diagram 2.2 is not present in the onion scale leaf.
Terangkan mengapa organel dalam Rajah 2.2 tidak terdapat pada daun sisik bawang itu.

[2 marks]
[2 markah]

2(e)(ii)

	2
--	---

- (iii) Explain what happens to the growth of an onion plant if the onion bulb is placed in a dark cupboard.
Terangkan apakah yang berlaku pada pertumbuhan bebawang jika bebawang itu diletak dalam almari gelap.

[2 marks]
[2 markah]

2(e)(iii)

	2
--	---

Total A2

	12
--	----

- 3 Table 3.1 and Table 3.2 show the data collected for two different characteristics from a group of 20 students in the same class.

Jadual 3.1 dan Jadual 3.2 menunjukkan data yang dikumpulkan bagi dua ciri yang berbeza daripada sekumpulan 20 orang pelajar dari kelas yang sama.

Height (cm) Ketinggian (cm)	160 – 164	165 – 169	170 – 174	175 – 179	180 – 185
Number of student Bilangan pelajar	2	5	8	4	1

Table 3.1

Jadual 3.1

Ability to roll tongue Kebolehan menggulung lidah	Able to roll the tongue Boleh menggulung lidah	Unable to roll the tongue Tidak boleh menggulung lidah
Number of student Bilangan pelajar	14	6

Table 3.2

Jadual 3.2

- (a) (i) There are two types of variation, continuous variation and discontinuous variation. State the type of variation for the characteristics of height and the ability to roll tongue.

Terdapat dua jenis variasi, variasi selanjar dan variasi tak selanjar.

Nyatakan jenis variasi bagi ciri-ciri ketinggian dan kebolehan menggulung lidah.

Height :
Ketinggian

Ability to roll tongue :
Kebolehan menggulung lidah

[2 marks]

[2 markah]

- (ii) State **two** differences between continuous variation and discontinuous variation. Nyatakan **dua** perbezaan antara variasi selanjar dengan variasi tak selanjar.

Continous variation Variasi selanjar	Discontinous variation Variasi tak selanjar

[2 marks]

[2 markah]

- (b) Diagram 3.1 shows how the variation of blood group is inherited by the offsprings. The types of blood group are A, B, AB and O. The alleles that control the types of blood group are I^A , I^B and I^O .
Rajah 3.1 menunjukkan bagaimana variasi kumpulan darah diwarisi oleh anak-anak. Jenis-jenis kumpulan darah adalah A, B, AB dan O. Alel-alel yang mengawal jenis kumpulan darah adalah I^A , I^B dan I^O .

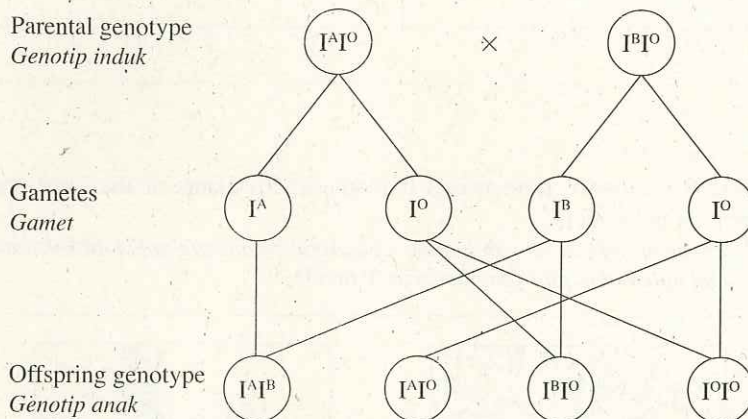


Diagram 3.1
Rajah 3.1

Based on Diagram 3.1, the offspring with genotype $I^B I^O$ has blood group B.
Explain how the offspring inherits blood group B.
Berdasarkan Rajah 3.1, anak yang genotipnya $I^B I^O$ mempunyai kumpulan darah B.
Terangkan bagaimana anak itu mewarisi kumpulan darah B.

.....

.....

.....

.....

.....

[3 marks]
[3 markah]

3(b)

3

- (c) Diagram 3.2 shows a white-coloured moth and grey-coloured moth of the same species on a tree trunk.
Rajah 3.2 menunjukkan seekor kupu-kupu putih dan seekor kupu-kupu kelabu yang sama spesies pada batang pokok.

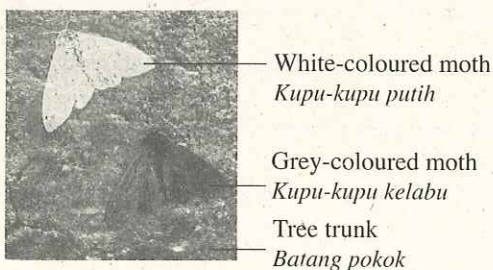


Diagram 3.2
Rajah 3.2

3(c)

2

The population of grey-coloured moth is more than the white-coloured moth.
Explain why.
*Populasi kupu-kupu kelabu melebihi populasi kupu-kupu putih.
Terangkan mengapa.*

[2 marks]

[2 markah]

- (d) Diagram 3.3 shows a farm which is planted with plants of the same species in two different plots, P and Q.

Rajah 3.3 menunjukkan sebuah ladang yang ditanam dengan pokok-pokok daripada spesies yang sama dalam dua plot yang berbeza, P dan Q.

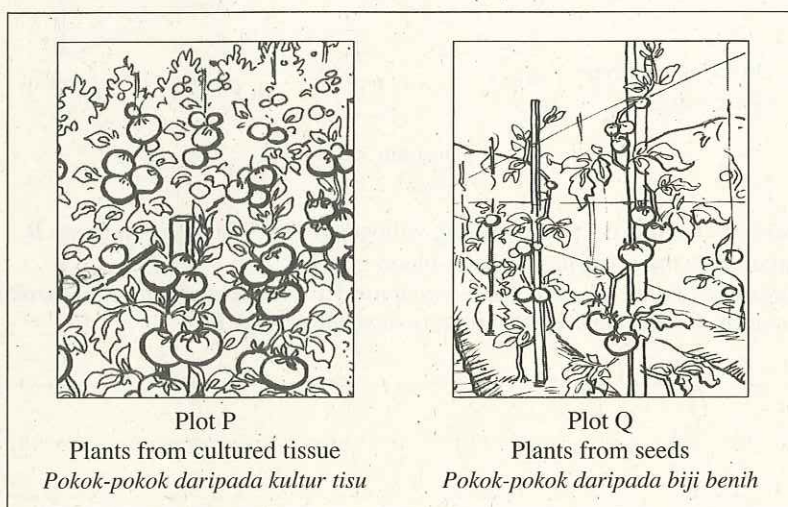


Diagram 3.3

Rajah 3.3

The farm has been infected by a disease. All plants in plot P die but only a few plants in plot Q die because of the infections.

Explain why all the plants in plot P die.

Ladang itu telah dijangkiti suatu penyakit. Semua pokok dalam plot P mati tetapi hanya sedikit pokok dalam plot Q yang mati akibat jangkitan itu.

Terangkan mengapa semua pokok dalam plot P mati.

[3 marks]

[3 markah]

3(d)

3

Total A3

12

- 4 Diagram 4 shows the structure of human skin in situations P and Q.
Rajah 4 menunjukkan struktur kulit manusia dalam situasi P dan situasi Q.

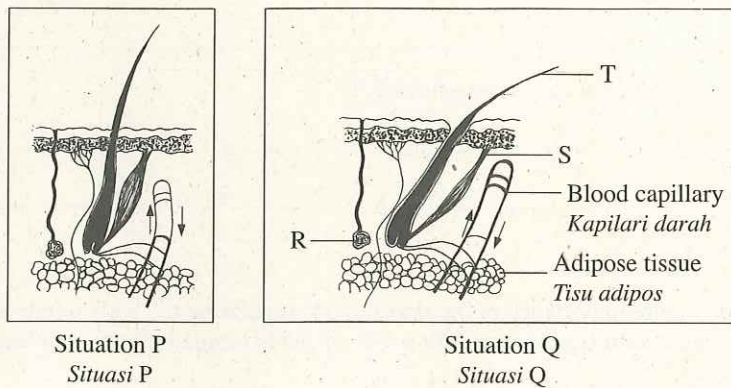


Diagram 4
Rajah 4

- (a) Name structures R and S.
Namakan struktur R dan struktur S.

R :

S :

[2 marks]

[2 markah]

- (b) (i) State **one** function of the adipose tissue.
Nyatakan **satu** fungsi tisu adipos.

.....

[1 mark]

[1 markah]

- (ii) Based on Diagram 4, explain the action of blood capillaries in regulating body temperature in situation P.

Berdasarkan Rajah 4, terangkan tindakan kapilari darah dalam mengawal atur suhu badan pada situasi P.

.....

.....

[2 marks]

[2 markah]

- (c) A boy's body temperature increases higher than 37 °C.

Explain how structures R, S and T act to lower the body temperature back to 37 °C.

Suhu badan seorang budak lelaki meningkat melebihi 37 °C.

Terangkan bagaimana struktur R, S dan T bertindak untuk merendahkan suhu badan kembali ke 37 °C.

Explanation for R / Penerangan untuk R

.....

.....

4(a)
2

4(b)(i)
1

4(b)(ii)
2

Explanation for S / Penerangan untuk S

.....

.....

Explanation for T / Penerangan untuk T

.....

.....

[5 marks]

[5 markah]

4(c)

5

- (d) Explain **one** importance of the skin besides regulating the body temperature.
*Terangkan **satu** kepentingan kulit selain daripada mengawal atur suhu badan.*

.....

.....

[2 marks]

[2 markah]

4(d)

2

Total A4

12

- 5 Diagram 5.1 shows the movement of water in a plant.

Diagram 5.2 shows the cross section of a leaf.

Rajah 5.1 menunjukkan pergerakan air dalam tumbuhan.

Rajah 5.2 menunjukkan keratan rentas satu daun.

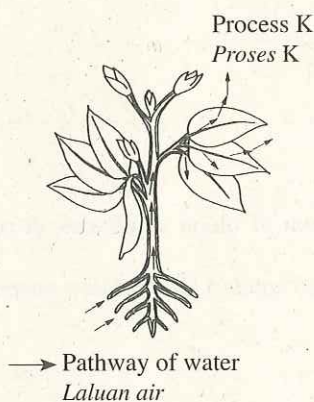


Diagram 5.1

Rajah 5.1

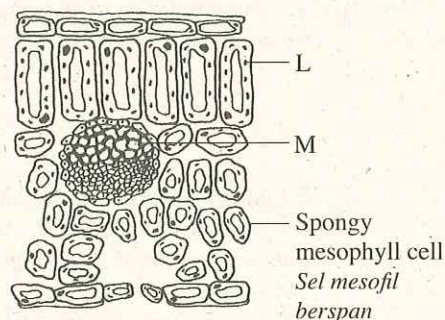


Diagram 5.2

Rajah 5.2

- (a) M is a type of vascular tissue.
Explain **one** adaptation of M in transporting water.
M ialah sejenis tisu vaskular.
*Terangkan **satu** penyesuaian pada M dalam mengangkut air.*

.....

.....

[2 marks]

[2 markah]

5(a)

2

- (b) (i) Explain the importance of process K to the plant.
Terangkan kepentingan proses K kepada tumbuhan itu.

.....

.....

.....

.....

[3 marks]

[3 markah]

- (ii) A tree is planted nearby a cement factory. Plenty of dust is released from the factory.
Explain how this condition affects process K in the tree.

Sebatang pokok ditanam berdekatan kilang simen. Banyak habuk dibebaskan dari kilang itu.

Terangkan bagaimana keadaan ini mempengaruhi proses K dalam pokok itu.

.....

.....

.....

[2 marks]

[2 markah]

- (c) A plant is submerged in water during flood for a few days.

Explain the effects of the occurrence to the respiration process of the plant.

Satu tumbuhan ditenggelami air semasa banjir selama beberapa hari.

Terangkan kesan kejadian tersebut kepada proses respirasi tumbuhan itu.

.....

.....

.....

[2 marks]

[2 markah]

- (d) State **one** difference in structure between cell L and spongy mesophyll cell.

*Nyatakan **satu** perbezaan struktur antara sel L dengan sel mesofil berspin.*

Cell L Sel L	Spongy mesophyll cell Sel mesofil berspin

[1 mark]

[1 markah]

5(b)(i)

	3
--	---

5(b)(ii)

	2
--	---

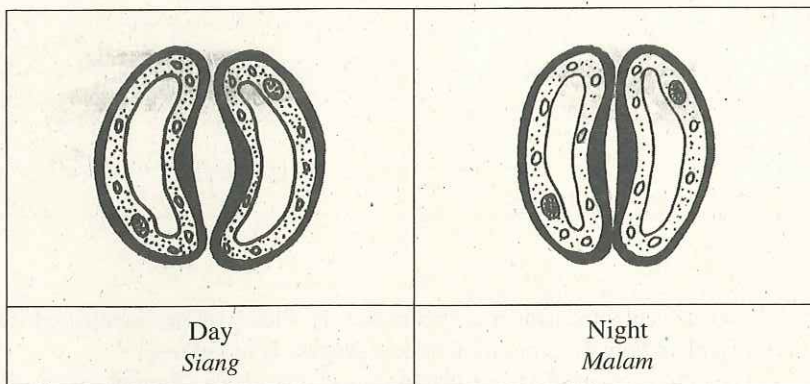
5(c)

	2
--	---

5(d)

	1
--	---

- (e) Diagram 5.3 shows the structure of guard cells during day and night.
Rajah 5.3 menunjukkan struktur sel pengawal pada waktu siang dan waktu malam.



Explain **one** difference in condition of the guard cells during day and night.
Terangkan **satu** perbezaan keadaan sel pengawal pada waktu siang dan pada waktu malam.

.....

.....

.....

[2 marks]
[2 markah]

5(e)

	2
--	---

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) Diagram 6.1 shows the respiratory structure of a grasshopper.
Rajah 6.1 menunjukkan struktur respirasi seekor belalang.

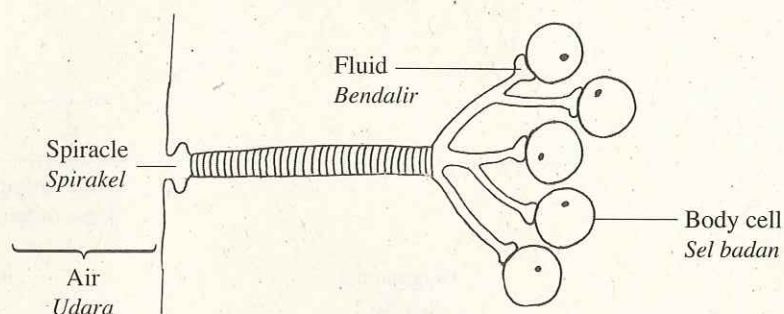


Diagram 6.1
Rajah 6.1

Explain how the body cells obtain oxygen from the air.
Terangkan bagaimana sel-sel badan memperoleh oksigen daripada udara.

[4 marks]
[4 markah]

- (b) Table 6 shows the breathing rate of a student during resting and during vigorous activity.
Jadual 6 menunjukkan kadar pernafasan seorang pelajar semasa berehat dan semasa melakukan aktiviti cergas.

Breathing rate (Breath per minute) Kadar pernafasan (Pernafasan per minit)	During resting Semasa berehat	During vigorous activity Semasa aktiviti cergas
	16	30

Table 6
Jadual 6

Explain why the breathing rate of the student is different during resting and during vigorous activity.

[4 marks]
[4 markah]

Terangkan mengapa kadar pernafasan pelajar itu berbeza semasa berehat dan semasa aktiviti cergas.

- (c) Diagram 6.2 shows the concentration of lactic acid in the blood of an athlete.
Rajah 6.2 menunjukkan kepekatan asid laktik dalam darah seorang atlet.

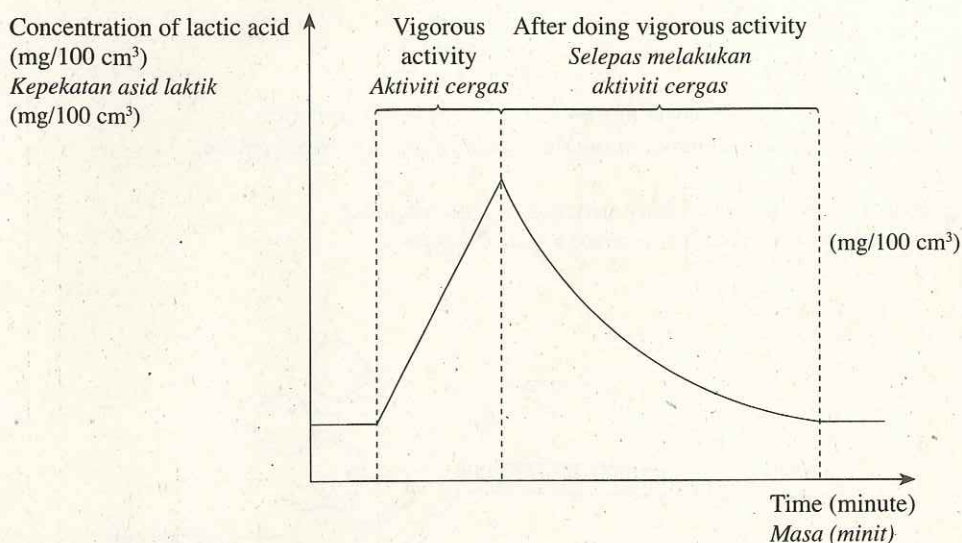


Diagram 6.2
Rajah 6.2

Explain the differences in the concentration of lactic acid in the blood of an athlete during and after doing vigorous activity. [6 marks]

Terangkan perbezaan kepekatan asid laktik dalam darah seorang atlet semasa dan selepas melakukan aktiviti cergas. [6 markah]

- (d) Diagram 6.3(a) shows alveoli of a healthy individual.

Diagram 6.3(b) shows alveoli of an individual with emphysema.

Rajah 6.3(a) menunjukkan alveolus individu yang sihat.

Rajah 6.3(b) menunjukkan alveolus individu yang menghidap emfisema.

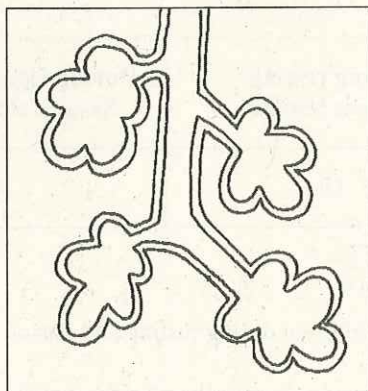


Diagram 6.3(a)
Rajah 6.3(a)

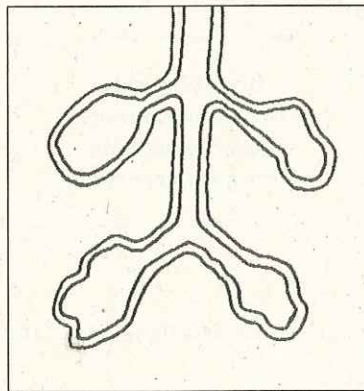


Diagram 6.3(b)
Rajah 6.3(b)

Emphysema is a type of lung disease.

Explain the effects of the disease to the health of the individual. [6 marks]

Emfisema adalah sejenis penyakit paru.

Terangkan kesan penyakit tersebut kepada kesihatan individu itu. [6 markah]

- 7 Diagram 7.1 shows a pair of homologous chromosomes. A characteristic is determined by a pair of alleles. T and t represent the alleles for the characteristic of height.

Rajah 7.1 menunjukkan sepasang kromosom homolog. Suatu ciri ditentukan oleh sepasang alel. T dan t mewakili alel bagi ciri ketinggian.

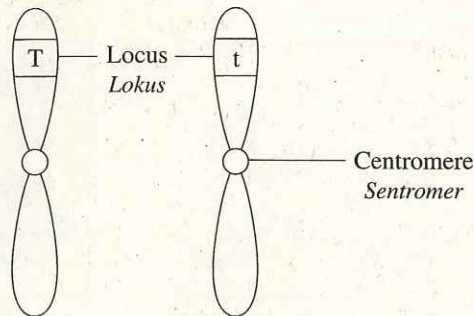


Diagram 7.1

Rajah 7.1

- (a) Based on Diagram 7.1, explain how the characteristic of height is determined. [4 marks]
Berdasarkan Rajah 7.1, terangkan bagaimana ciri ketinggian ditentukan. [4 markah]

- (b) Diagram 7.2 shows the inheritance of haemophilia in a family. Haemophilia is a sex-linked disease. The father is a normal male with genotype $X^H Y$, while the mother is a haemophiliac female with genotype $X^h X^h$.
Rajah 7.2 menunjukkan perwarisan hemofilia dalam sebuah keluarga. Hemofilia adalah penyakit terangkai seks. Bapanya seorang lelaki normal dengan genotip $X^H Y$, manakala ibunya seorang wanita hemofilia dengan genotip $X^h X^h$.

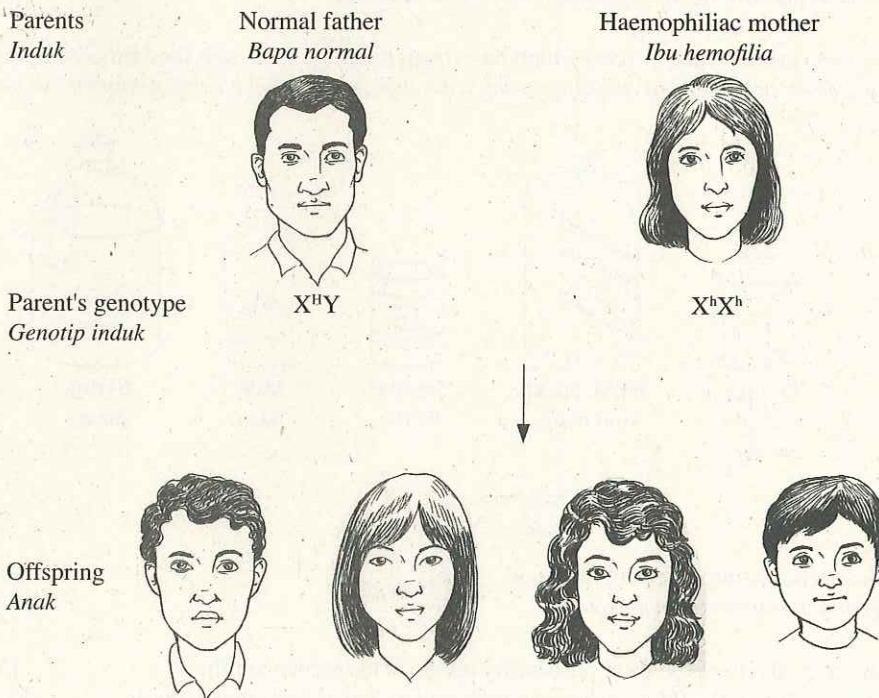


Diagram 7.2

Rajah 7.2

Explain the probability of the offsprings to inherit haemophilia.
Terangkan kebarangkalian anak-anak mewarisi hemofilia.

[6 marks]
[6 markah]

- (c) Diagram 7.3 shows the conditions of red blood cells of two individuals, P and Q. Individual Q suffers from a genetic disease.
Rajah 7.3 menunjukkan keadaan sel darah merah dua individu, P dan Q.
Individu Q menghidap suatu penyakit genetik.

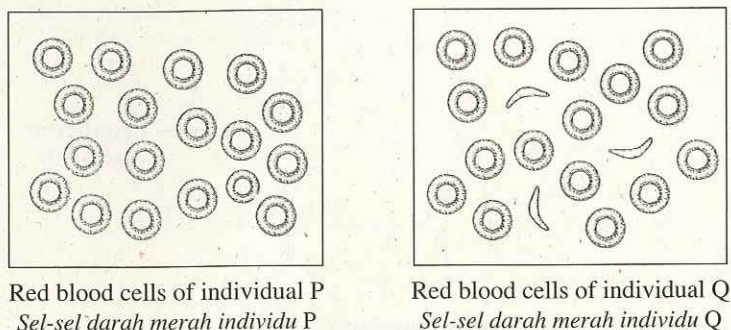


Diagram 7.3
Rajah 7.3

Explain the difference in health between individuals P and Q.
Terangkan perbezaan kesihatan antara individu P dengan individu Q.

[4 marks]
 [4 markah]

- (d) Bacteria can genetically modified to produce insulin.
 Explain the use of the insulin for a diabetic patient.
Bakteria boleh diubah suai secara genetik untuk menghasilkan insulin.
Terangkan kegunaan insulin itu bagi seorang pesakit kencing manis.

[6 marks]
 [6 markah]

- 8 (a) Diagram 8.1 shows various types of food which have been processed through food processing methods.
Rajah 8.1 menunjukkan pelbagai jenis makanan yang telah diproses melalui kaedah pemprosesan makanan.

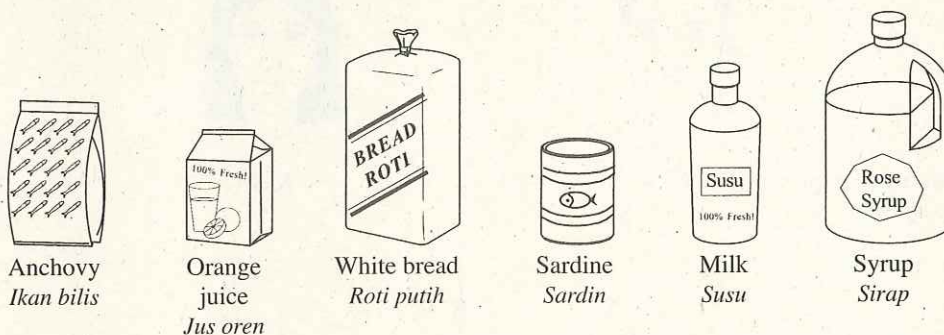


Diagram 8.1
Rajah 8.1

- (i) Explain the purposes of processing the food.
Terangkan tujuan pemprosesan makanan.
- (ii) Explain the bad effects of the food processing methods to human health.
Terangkan kesan buruk kaedah pemprosesan makanan terhadap kesihatan manusia.

[5 marks]
 [5 markah]

[5 marks]
 [5 markah]

- (b) Diagram 8.2 shows a food pyramid.
Rajah 8.2 menunjukkan piramid makanan.

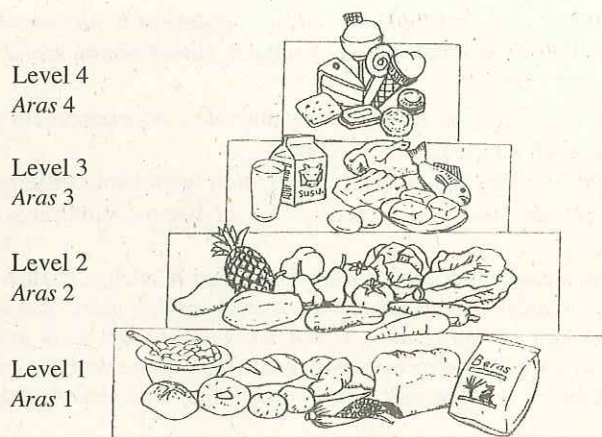


Diagram 8.2 / Rajah 8.2

Explain the importance of the food for each level in the food pyramid.
Terangkan kepentingan makanan bagi setiap aras dalam piramid makanan.

[10 marks]
 [10 markah]

- 9 Diagram 9.1 shows an ecosystem. / *Rajah 9.1 menunjukkan suatu ekosistem.*

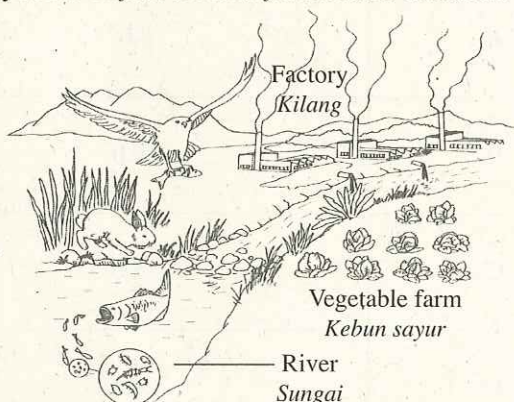


Diagram 9.1 / Rajah 9.1

- (a) Many new factories are built nearby the river.

Explain the bad effects of the presence of the factories to the ecosystem.

[10 marks]

Banyak kilang baharu didirikan berdekatan dengan sungai.

Terangkan kesan buruk kewujudan kilang-kilang tersebut terhadap ekosistem itu.

[10 markah]

- (b) (i) Explain the importance of maintaining the river as a habitat in the ecosystem.

[4 marks]

Terangkan kepentingan mengekalkan sungai sebagai satu habitat dalam ekosistem itu.

[4 markah]

- (ii) Describe ways to improve the water quality of the river for a better survival of aquatic organisms.

[6 marks]

Huraikan cara-cara untuk menambahbaik kualiti air sungai untuk kemandirian organisma akuatik yang lebih baik.

[6 markah]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

This question paper consists of two questions: **Question 1** and **Question 2**. Answer **all** questions.
Kertas soalan ini mengandungi dua soalan: **Soalan 1** dan **Soalan 2**. Jawab **semua** soalan.

- 1** Growth in organisms involves increasing in size, height and mass. An experiment was carried out to study the effect of nutrients concentration on the growth of plants.

Maize seeds are planted in five petri dishes with moist cotton wool using different concentration of Knop's solution. Each petri dish contains two maize seeds. 5 mL of Knop's solution is added into each petri dish everyday.

Table 1.1 shows the different concentrations of Knop's solution in each petri dish.

Pertumbuhan organisma melibatkan pertambahan saiz, ketinggian dan jisim. Satu eksperimen telah dijalankan untuk mengkaji kesan kepekatan nutrien ke atas pertumbuhan pokok. Biji benih jagung ditanam di dalam lima piring petri yang mengandungi kapas lembap menggunakan larutan Knop dengan kepekatan yang berbeza. Setiap piring petri mengandungi dua biji benih jagung. 5 mL larutan Knop ditambah ke dalam setiap piring petri setiap hari.

Jadual 1.1 menunjukkan kepekatan larutan Knop yang berbeza dalam setiap piring petri.

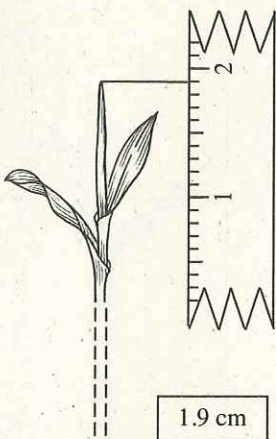
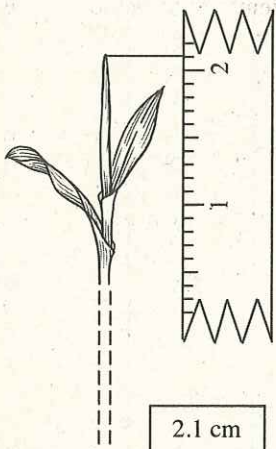
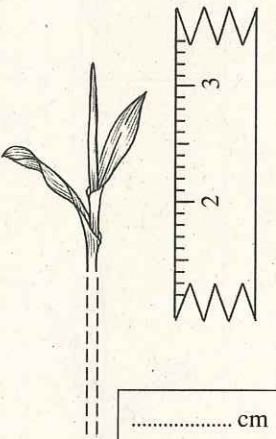
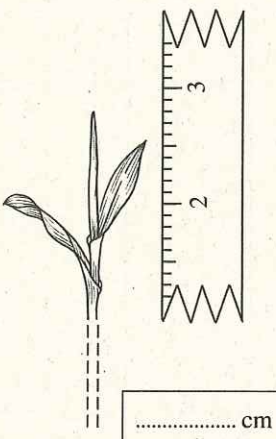
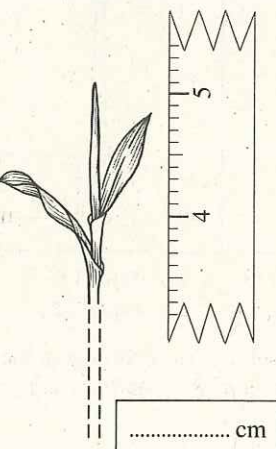
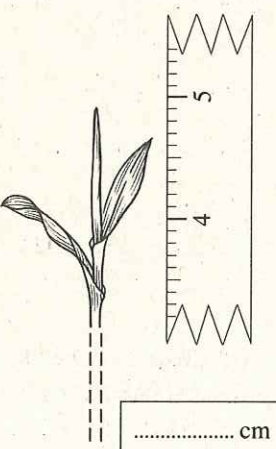
Petri dish <i>Piring petri</i>	Concentration of Knop's solution <i>Kepekatan larutan Knop (%)</i>
A	5.0
B	10.0
C	15.0
D	20.0
E	25.0

Table 1.1

Jadual 1.1

Table 1.2 in page 129 and 130 shows the result of this experiment after four days.

Jadual 1.2 pada halaman 129 dan 130 menunjukkan keputusan eksperimen ini selepas empat hari.

Petri dish Piring petri	Concentration of Knop's solution Kepekatan larutan Knop (%)	Height of maize seedling Ketinggian anak benih jagung	
		Maize seedling 1 Anak benih jagung 1	Maize seedling 2 Anak benih jagung 2
A	5.0	 <p>1.9 cm</p>	 <p>2.1 cm</p>
B	10.0	 <p>..... cm</p>	 <p>..... cm</p>
C	15.0	 <p>..... cm</p>	 <p>..... cm</p>

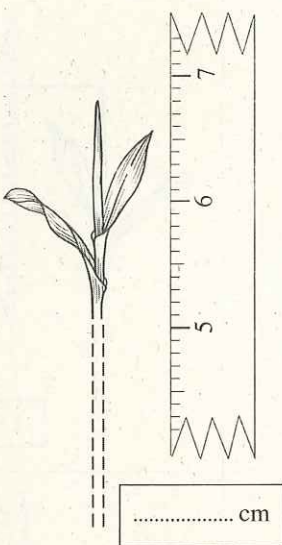
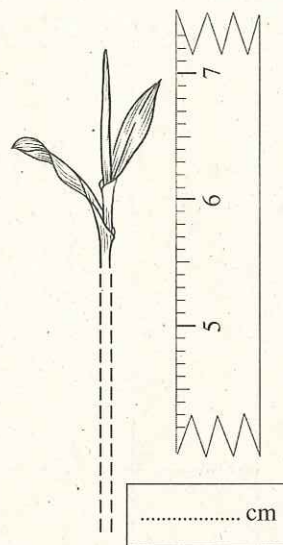
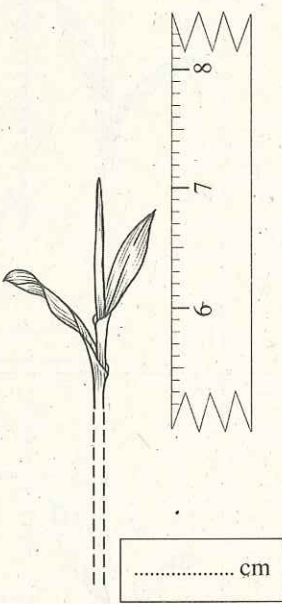
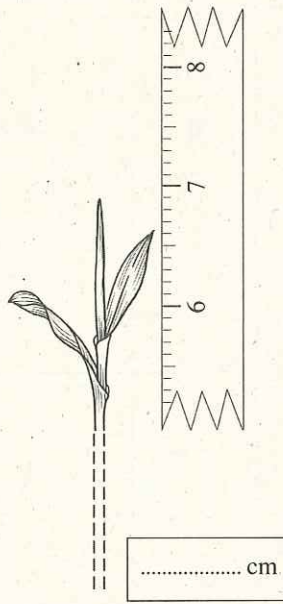
Petri dish Piring petri	Concentration of Knop's solution Kepekatan larutan Knop (%)	Height of maize seedling Ketinggian anak benih jagung	
		Maize seedling 1 Anak benih jagung 1	Maize seedling 2 Anak benih jagung 2
D	20.0		
E	25.0		

Table 1.2

Jadual 1.2

- (a) Record the height of each maize seedlings in the boxes provided in Table 1.2.
 Rekod ketinggian bagi setiap anak benih jagung dalam petak yang disediakan dalam Jadual 1.2.

[3 marks]
 [3 markah]

1(a)

	3
--	---

- (b) (i) Based on Table 1.2, state **two** observations made on the height of the maize seedlings in any petri dish.

Berdasarkan Jadual 1.2, nyatakan **dua** pemerhatian yang dibuat terhadap ketinggian anak benih jagung dalam mana-mana piring petri.

Observation 1:
Pemerhatian 1

Observation 2:
Pemerhatian 2

[3 marks]

[3 markah]

1(b)(i)

	3
--	---

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

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

Inference from observation 1:
Inferens daripada pemerhatian 1

Inference from observation 2:
Inferens daripada pemerhatian 2

[3 marks]

[3 markah]

1(b)(ii)

	3
--	---

- (c) Complete Table 1.3 based on this experiment.

Lengkapkan Jadual 1.3 berdasarkan eksperimen ini.

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

Table 1.3

Jadual 1.3

[3 marks]

[3 markah]

1(c)

	3
--	---

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

.....

.....

.....

[3 marks]

[3 markah]

1(d)

3

- (e) (i) Construct a table and record all the data collected from Table 1.2.

Your table should have the following titles:

Bina satu jadual dan rekodkan semua data yang dikumpul dari Jadual 1.2.

Jadual anda hendaklah mengandungi tajuk-tajuk berikut:

- Concentration of Knop's solution
Kepekatan larutan Knop
- Height of maize seedling 1 and maize seedling 2
Ketinggian anak benih jagung 1 dan ketinggian anak benih jagung 2.
- Average height of the maize seedlings
Purata ketinggian anak benih jagung
- Growth rate of maize seedling
Kadar pertumbuhan anak benih jagung

$$\left[\text{Growth rate} = \frac{\text{Average height}}{\text{Days}} \right]$$

$$\left[\text{Kadar pertumbuhan} = \frac{\text{Purata ketinggian}}{\text{Hari}} \right]$$

1(e)(i)

3

[3 marks]

[3 markah]

- (ii) Use the graph paper provided on page 133 to answer this question.

Using the data in 1(e)(i), draw a graph of growth rate of maize seedlings against the concentration of Knop's solution.

Guna kertas graf yang disediakan di halaman 133 untuk menjawab soalan ini.

Menggunakan data di 1(e)(i), lukis graf kadar pertumbuhan anak benih jagung melawan kepekatan larutan Knop.

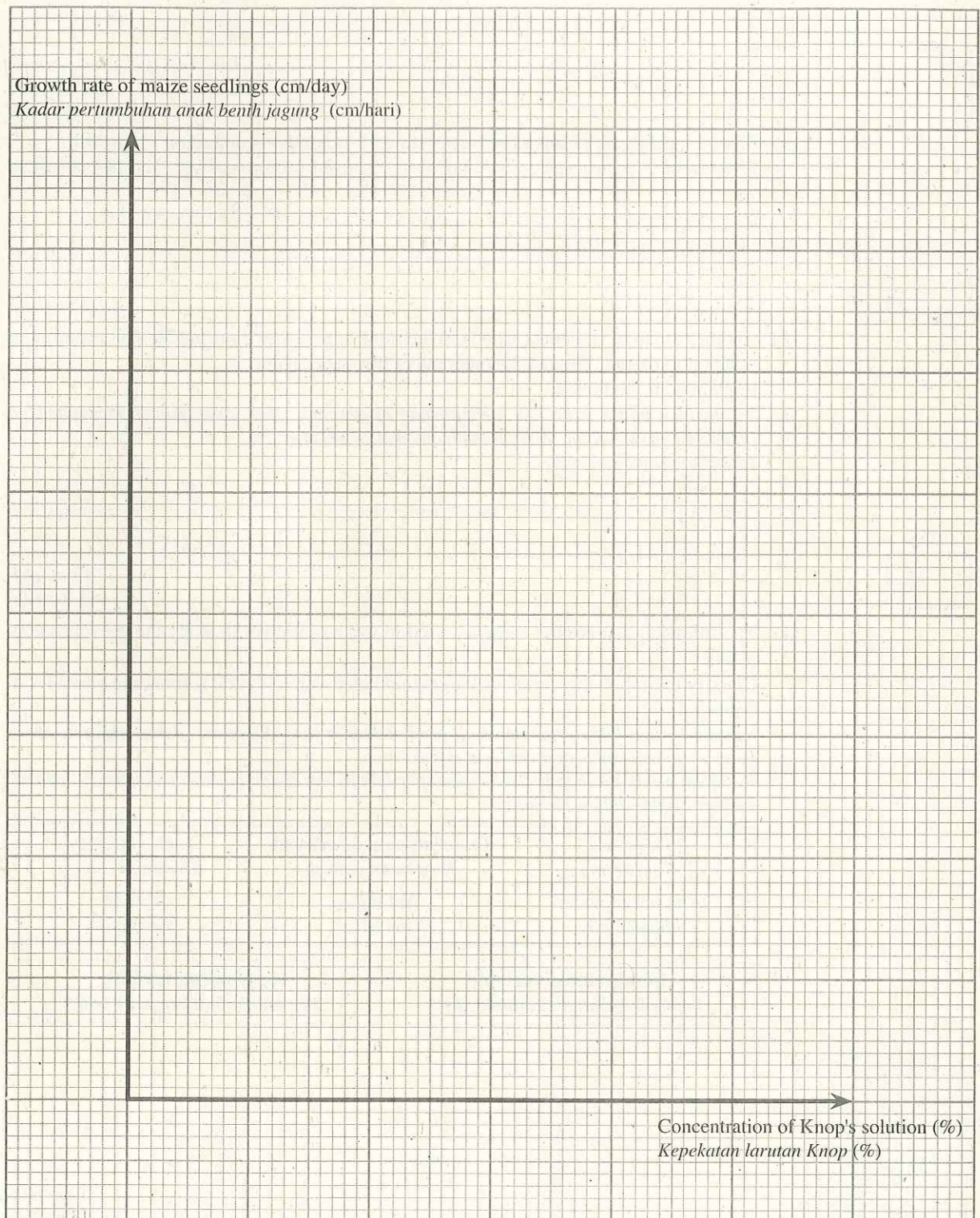
1(e)(ii)

3

[3 marks]

[3 markah]

Growth rate of maize seedlings against concentration of Knop's solution.
Kadar pertumbuhan anak benih jagung melawan kepekatan larutan Knop.



1(f)

3

- (f) Based on the graph in 1(e)(ii), state the relationship between the concentration of Knop's solution and the growth rate of maize seedlings. Explain your answer.
Berdasarkan graf di 1(e)(ii), nyatakan hubungan antara kepekatan larutan Knop dengan kadar pertumbuhan anak benih jagung. Terangkan jawapan anda.

[3 marks]

[3 markah]

1(g)

3

- (g) Based on the result of this experiment, state the operational definition for growth.
Berdasarkan keputusan eksperimen ini, nyatakan definisi secara operasi untuk pertumbuhan.

[3 marks]

[3 markah]

1(h)

3

- (h) Another group of students carried out the same experiment by using 50 % concentration of Knop's solution. Predict the outcome of this experiment.

Explain your prediction.

Sekumpulan murid yang lain menjalankan eksperimen yang sama dengan menggunakan kepekatan larutan Knop 50 %. Ramalkan hasil eksperimen ini.

Terangkan ramalan anda.

[3 marks]

[3 markah]

- (i) The following list are the variables used in this experiment to study the growth rate in plants.

Classify the following variables into manipulated variables and responding variables in Table 1.4.

Senarai berikut ialah pembolehubah-pembolehubah yang digunakan dalam eksperimen ini untuk mengkaji kadar pertumbuhan pokok.

Kelaskan pembolehubah berikut kepada pembolehubah dimanipulasikan dan pembolehubah bergerak balas dalam Jadual 1.4.

Dry mass <i>Jisim kering</i>	Concentration of nutrient <i>Kepekatan nutrien</i>	Light intensity <i>Keamatan cahaya</i>
Amount of water <i>Jumlah air</i>	Wet mass <i>Jisim basah</i>	Height <i>Ketinggian</i>

Manipulated variable <i>Pembolehubah dimanipulasikan</i>	Responding variable <i>Pembolehubah bergerak balas</i>

1(i)

3

Total 1

33

Table 1.4

Jadual 1.4

[3 marks]

[3 markah]

- 2 Starch and protein contained in food are large molecules. Large molecules cannot be absorbed by the villi of the small intestine. Glucose and amino acids are small molecules which can diffuse into the villi.

Based on the information above, plan a laboratory experiment to show that small molecules are able to diffuse across a semipermeable membrane but large molecules cannot.

The planning of your experiment must include the following aspects:

Kanji dan protein yang terkandung dalam makanan merupakan molekul besar.

Molekul besar tidak boleh diserap oleh vilus usus kecil. Glukosa dan asid amino adalah molekul kecil yang boleh meresap ke dalam vilus.

Berdasarkan maklumat di atas, rancang satu eksperimen dalam makmal untuk menunjukkan bahawa molekul kecil boleh meresap merentasi membran separa telap tetapi molekul besar tidak boleh.

Perancangan eksperimen anda hendaklah meliputi aspek-aspek berikut:

- Problem statement
Pernyataan masalah
- Hypothesis
Hipotesis
- Variables
Pembolehubah
- List of apparatus and materials
Senarai radas dan bahan
- Procedure of experiment
Prosedur eksperimen
- Presentation of data
Persembahan data

[17 marks]

[17 markah]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT