4551/1
BIOLOGY /F
Kertas 1
SEPT/ 2011
1 ½ Jam

BIOLOGY

Tingkatan 5

Kertas 1

Satu Jam Lima Belas Minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU.

1 *Kertas soalan ini adalah dalam dwibahasa..*

2. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*

3. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Kertas soalan ini mengandungi 31 halaman bercetak dan 1 halaman tidak bercetak.

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1 Diagram 1 shows a plant cell.
Rajah 1 menunjukkan satu sel tumbuhan.

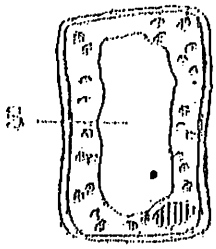

Diagram 1
Rajah 1

What is the function of structure S?
Apakah fungsi struktur S?

A Excretes waste products from the cell.
Mengeluarkan bahan kumuh daripada sel.

B Maintains turgidity of the cell.
Mengekalkan kesegahan sel.

C Controls the size of the cell.
Mengawal saiz sel.

D Maintains the shape of the cell.
Mengekalkan bentuk sel.

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

A As carrier membrane to move substances across the plasma membrane by active transport.
Sebagai membran pembawa yang mengangkut bahan merentasi membran plasma secara pengangkutan aktif.

B To form protein pores for facilitated diffusion of mineral ions.
Membentuk liang protein untuk resapan berbantu ion mineral.

C To join the proteins with phospholipid molecules.
Menghubungkan protein dengan molekul fosfolipid .

D To stabilise the fluidity of the plasma membrane.
Menstabilkan keanjalan membran plasma.

3 Diagram 2 shows diffusion in potato cells:
Rajah 2 menunjukkan resapan dalam sel kentang.

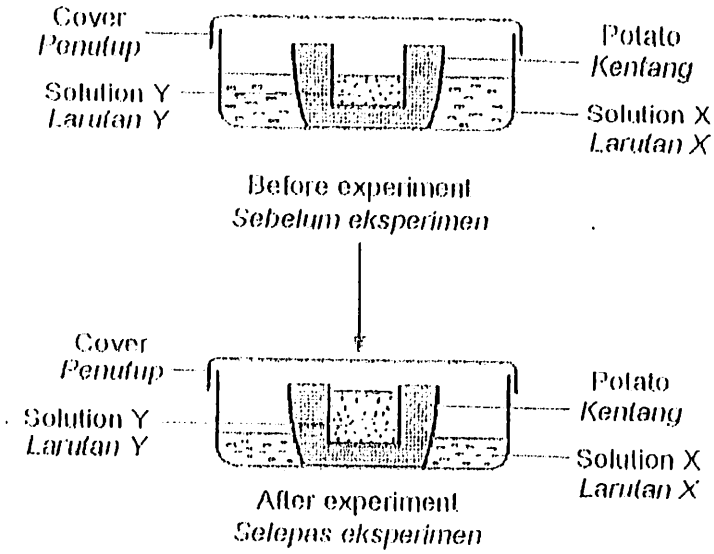

Diagram 2
Rajah 2

What is solution X and solution Y?
Apakah larutan X dan larutan Y?

	Solution X / *Larutan X*	Solution Y / *Larutan Y*
A	Distilled water *Air suling*	Distilled water *Air suling*
B	10% sucrose solution *Larutan sukrosa 10%*	10% sucrose solution *Larutan sukrosa 10%*
C	Distilled water *Air suling*	10% sucrose solution *Larutan sukrosa 10%*
D	10% sucrose solution *Larutan sukrosa 10%*	Distilled water *Air suling*

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4 Diagram 3 shows plant cells immersed in solution A for 30 minutes.
Rajah 3 menunjukkan sel tumbuhan yang direndam dalam larutan A selama 30 minit.

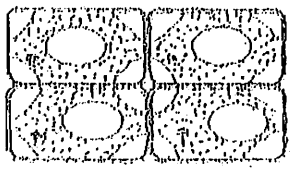

Diagram 3
Rajah 3

Name the process in which the plant cells have undergone?
Namakan proses yang telah dialami oleh sel-sel tumbuhan ini?

A Haemolysis
Hemolisis

B Crenation
Krenasi

C Plasmolysis
Plasmolisis

D Deplasmolysis
Deplasmolisis

5 Diagram 4 shows the visking tube which is filled with distilled water and immersed in sucrose solution.
Rajah 4 menunjukkan tiub visking yang diisi dengan air suling dan direndam dalam larutan sukrosa.

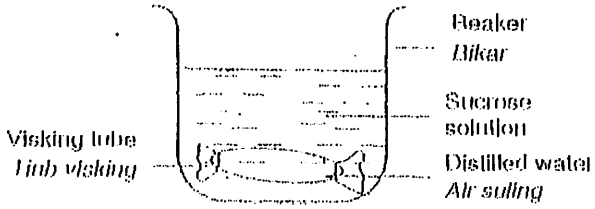

Diagram 4
Rajah 4

What is the observation after 30 minutes?
Apakah pemerhatian selepas 30 minit?

A Visking tube swells
Tiub visking mengembang

B No change occurs
Tiada perubahan berlaku

C Visking tube shrinks
Tiub visking mengecut

D Visking tube bursts
Tiub visking pecah

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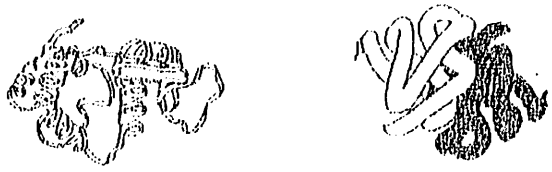
6 Diagram 5 shows two types of protein structure.
Rajah 5 menunjukkan dua jenis struktur protein.



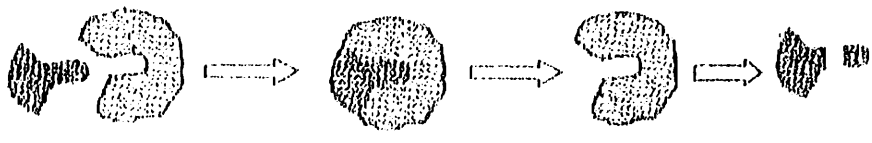
Y Z

Diagram 5
Rajah5

Which of the following are the correct examples?
Antara berikut, yang manakah contoh yang betul?

	Y	Z
A	Keratin / *Keratin*	Haemoglobin / *Haemoglobin*
B	Haemoglobin / *Haemoglobin*	Enzyme / *Enzim*
C	Haemoglobin / *Haemoglobin*	Keratin / *Keratin*
D	Antibody / *Antiboді*	Haemoglobin / *Haemoglobin*

7 Diagram 6 shows a hydrolysis process by an enzyme .
Rajah 6 menunjukkan proses hidrolisis oleh enzim.



A B C D

Diagram 6
Rajah 6

Which of the structure labeled A, B , C and D represent the enzyme?
Antara struktur berlabel A,B C dan D, manakah mewakili enzim?

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8 Diagram 7 shows the effects of temperature on the rate of an enzyme reaction.
Rajah 7 menunjukkan kesan suhu ke atas kadar tindak balas enzim.

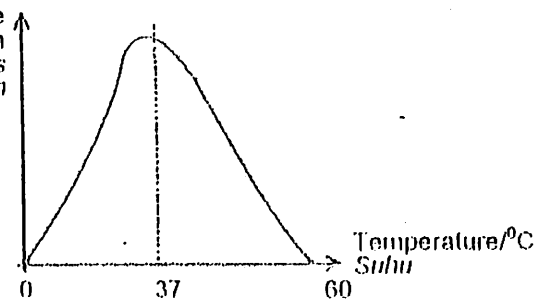

Diagram 7
Rajah 7

Which of the following statement is correct?
Pernyataan yang manakah betul?

A When the temperature is low, the rate of enzyme reaction is high.
Apabila suhu rendah, kadar tindak balas enzim tinggi

B When the temperature is high, the rate of reaction is not accelerated
Apabila suhu tinggi, kadar tindak balas tidak meningkat

C When the temperature is optimum, the rate of reaction is maximum
Apabila suhu optimum, kadar tindak balas maksimum

D When the temperature is beyond optimum, the rate of reaction increases
Apabila suhu melampaui optimum, kadar tindak balas meningkat

9 Diagram 8 shows part of the contents of a nucleus.
Rajah 8 menunjukkan sebahagian kandungan dalam nukleus sel.

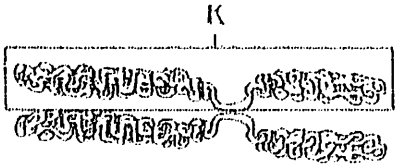

Diagram 8
Rajah 8

What is K?
Apakah K?

A Chromosome
Kromosom

B Gene
Gen

C Chromatid
Kromatid

D Double helix DNA
DNA heliks ganda dua

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10 Diagram 9 shows the different stages of mitosis.
Rajah 9 menunjukkan peringkat-peringkat yang berbeza dalam mitosis.

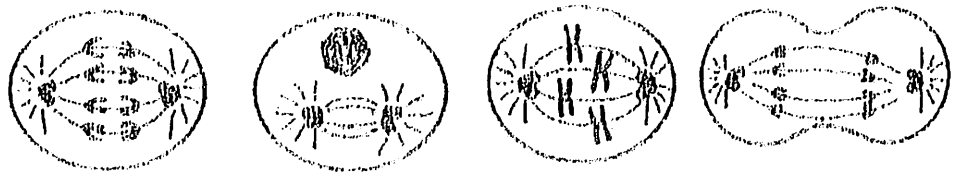


Diagram 9 / *Rajah 9*

Arrange the diagrams in the correct sequence.
Susun rajah tersebut dalam urutan yang betul.

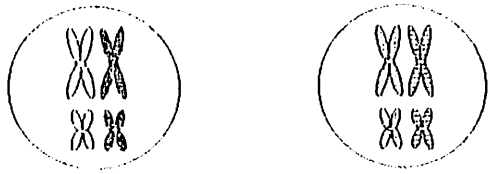
A P →Q→R→S

B Q →R→P→S

C S →R→Q →P

D S →R→P→Q

11 Diagram 10 shows the homologous chromosomes in organisms P and Q before meiosis.
Rajah 10 menunjukkan kromosom homolog dalam organism P dan Q sebelum meiosis.



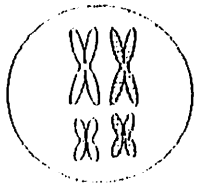
Organism P
Organisma P

Organism Q
Organisma Q

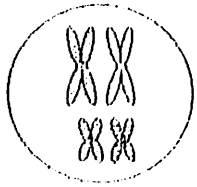
Diagram 10
Rajah 10

Which of the following shows the product of fertilization between organism P and Q?
Antara berikut yang manakah merupakan hasil persenyawaan antara organism P dan organism Q?

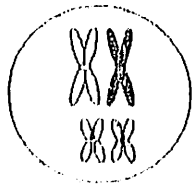
A



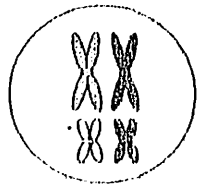
B



C



D



12 Diagram 11a shows the chromosomes of a parent cell.
Rajah 11a menunjukkan kromosom dalam sel induk.

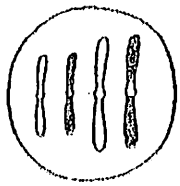


Diagram 11a
Rajah 11a

Diagram 11b shows the possible combinations of chromosomes in the daughter cells when the parent cell divides.
Rajah 11b menunjukkan kemungkinan gabungan kromosom dalam sel anak apabila sel induk membahagi.

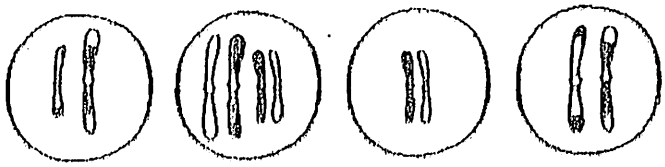


Diagram 11b
Rajah 11b

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

A Cell X has haploid number of chromosomes
Sel X mempunyai bilangan kromosom yang haploid.

B Cell Z is a product of meiosis
Sel Z adalah hasil meiosis.

C Cell Y is a product of mitosis
Sel Y adalah hasil mitosis

D Cell W can become a gamete
Sel W boleh menjadi gamet

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13 Diagram 12 shows a phase during meiosis.
Rajah 12 menunjukkan satu fasa semasa meiosis.

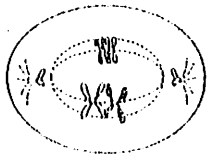

Diagram 12
Rajah 12

What is the significance of the phase shown?
Apakah kepentingan fasa tersebut?

A Produces daughter cells with equal number of chromosome as the parent cell.
Menghasilkan sel anak yang mempunyai bilangan kromosom yang sama dengan sel induk.

B Causes crossing over to occur between sister chromatids.
Menyebabkan pindah silang berlaku antara kromatid beradik.

C Halves the number of chromosome in each daughter cell.
Bilangan kromosom dalam sel anak menjadi separuh.

D Produces variation in gametes
Menghasilkan variasi pada gamet.

14 Diagram 13 shows a longitudinal section of a villus.
Rajah 13 menunjukkan keratan memanjang vilus.

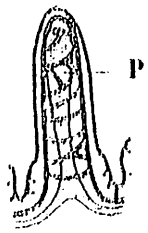

Diagram 13
Rajah13

Which of the following nutrients are found in P?
Antara nutrient berikut, yang manakah dijumpai di dalam P?

I Glucose
Glukosa
II Amino acid
Asid amino
III Fat
Lemak
IV Vitamin D
Vitamin D

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

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15 The following statements refer to stage X during photosynthesis.
Pernyataan berikut merujuk kepada peringkat X semasa fotosintesis.

- Hydrogen ions are produced
  Ion hidrogen dihasilkan
- ATP is produced
  ATP dihasilkan
- Water molecules are broken down
  Molekul air terurai

What is stage X?
Apakah peringkat X?

A Decomposition of hydrocarbons
Perepulan hidrokarbon

B Reduction of carbon dioxide
Penurunan karbon dioksida

C Photolysis of water
Fotolisis air

D Production of glucose
Penghasilan glukosa

16 The following measurements were made during an experiment to determine the energy value of a peanut.
Pengukuran berikut dibuat semasa eksperimen untuk menentukan nilai tenaga kacang tanah.

• Mass of peanut *Jisim kacang tanah*	=	2 g
• Mass of water *Jisim air*	=	10 g
• Initial water temperature *Suhu awal air*	=	26°C
• Final water temperature *Suhu akhir air*	=	66°C

The specific heat capacity of water is 4.2 $Jg^{-1}C^{-1}$. Calculate the energy value of the peanut.
Muatan haba tentu air ialah 4.2 $Jg^{-1}C^{-1}$. Hitung nilai tenaga kacang tanah.

A 55.4 J/g
B 336 J/g
C 546 J/g
D 840 J/g

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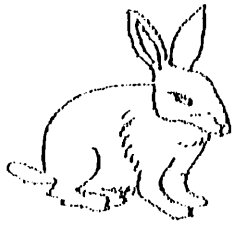
17 Diagram 14 shows organism X and organism Y.
Rajah 14 menunjukkan organism X dan organism Y.



X

Y

Diagram 14
Rajah14

How do both organisms adapt themselves to transport substances efficiently into and out of their bodies?

Bagaimanakah kedua-dua organism dapat mengadaptasi diri untuk mengangkut bahan masuk dan keluar dari badan dengan berkesan?

I Y expels waste products by simple diffusion
Y menyingkir bahan buangan melalui resapan ringkas

II Y has a specialised medium to transport substances
Y mempunyai medium yang khusus untuk pengangkutan bahan

III X has projections and folds in its organs
X mempunyai unjuran dan lipatan pada organnya

IV X has many specialised structure to expel waste products
X mempunyai struktur khusus untuk menyingkir bahan buangan

A I and II only
I dan II sahaja

B II and III only
II dan III sahaja

C I, II and III only
I, II dan III sahaja

D I, III and IV only
I, III dan IV sahaja

[Lihat halaman sebelah

18 Table 1 shows the volume of fruit juice required to decolorize 1 ml DCPIP.
Jadual 1 menunjukkan isipadu jus buah-buahan yang diperlukan untuk melunturkan warna 1ml DCPIP.

Type of juice *Jenis jus*	Volume of fruit juice required to decolorize 1 ml DCPIP(ml) *Isipadu jus buah yang diperlukan untuk melunturkan 1 ml DCPIP*
0.1% Ascorbic acid *0.1% Asid askorbik*	1.0
Lime juice *Jus limau*	3.6
Papaya juice *Jus betik*	8.0

Table 1 / *Jadual 1*

What is the percentage of vitamin C found in lime juice and papaya juice?
Apakah peratus vitamin C yang terdapat didalam jus limau dan jus betik?

	Lime juice (mg/100ml) *Jus limau(mg/100ml)*	Papaya juice (mg/100ml) *Jus betik(mg/100ml)*
A	45.0	27.8
B	27.8	12.5
C	44.0	12.5
D	55.0	44.0

19 Diagram 15 shows a part of human digestive system.
Rajah 15 menunjukkan sebahagian dari sistem pencernaan manusia.

Diagram 15
Rajah 15

Which process is affected when organ X fails to function.
Proses manakah yang akan terjejas jika organ X tidak berfungsi.

A Digestion of sucrose
Pencernaan sukrosa

B Emulsification of lipids
Pengemulsian lipid

C Secretion of pepsin
Rembesan pepsin

D Conversion of glucose to glycogen
Penukaran glukosa ke glikogen

20 Diagram 16 shows relationship between photosynthesis and cell respiration.
Rajah 16 menunjukkan hubung kait antara fotosintesis dan respirasi sel.

Diagram 16
Rajah 16

What are X and Y?
Apakah X dan Y?

	X	Y
A	Glucose, oxygen *Glukosa, oksigen*	Glucose, carbon dioxide *Glukosa, karbon dioksida*
B	Glucose, carbon dioxide *Glukosa, karbon dioksida*	Glucose, oxygen *Glukosa, oksigen*
C	Glucose, oxygen *Glukosa, oksigen*	Water, carbon dioxide, ATP *Air, karbon dioksida, ATP*
D	Starch, energy *Kanji, tenaga*	Carbon dioxide *Karbon dioksida*

21 Diagram 17 shows paddy plants in a paddy field.
Rajah 17 menunjukkan tumbuhan padi dalam sawah.

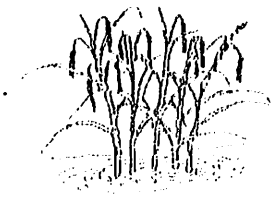


Diagram 17
Rajah 17

What are the products of respiration in the leaves and roots?
Apakah hasil respirasi pada daun dan akarnya?

	Products of respiration in leaves *Hasil respirasi di daun*	Products of respiration in roots *Hasil respirasi di akar*
A	Carbon dioxide and water *Karbon dioksida dan air*	Lactic acid and carbon dioxide *Asid laktik dan karbon dioksida*
B	Carbon dioxide and water *Karbon dioksida dan air*	Ethanol and carbon dioxide *Etanol dan karbon dioksida*
C	Lactic acid and carbon dioxide *Asid laktik dan karbon dioksida*	Carbon dioxide and water *Karbon dioksida dan air*
D	Ethanol and carbon dioxide *Etanol dan karbon dioksida*	Carbon dioxide and water *Karbon dioksida dan air*

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22 The chemical equation shows a type of respiration in human muscle during vigorous exercise.
Persamaan kimia menunjukkan sejenis respirasi yang berlaku dalam otot manusia semasa aktiviti cergas.

$$C_6H_{12}O_6 \longrightarrow 2C_3H_6O_3 + 150\ kJ$$

Which statement explains why muscle cells needs more oxygen just after the activity.
Pernyataan manakah yang menerangkan kenapa sel otot memerlukan lebih oksigen sebaik sahaja selepas aktivit tersebut.

A To transfer lactic acid from muscle tissues to the liver.
Memindahkan asid laktik dari tisu otot ke hati.

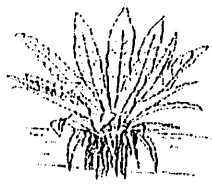
B To oxidise lactic acid to produce energy
Mengoksidakan asid laktik bagi menghasilkan tenaga.

C To oxidise lactic acid to glucose
Mengoksidakan asid laktik kepada glukosa.

D To convert glucose to glycogen.
Menukarkan glukosa kepada glikogen

23 Which of the following organisms is a saprophyte?
Antara organisma berikut yang manakah saprofit?

A 

C 

B 

D 

24 Which of the following are adaptations by the **Sonneratia sp.** to enable it to grow in the mangrove swamp?
*Antara berikut, yang manakah penyesuaian **Sonneratia sp.** untuk membolehkannya tumbuh di paya bakau?*

I	Thick and succulent leaves *Daun yang tebal dan sukulen*	III	Buttress roots *Akar banir*
II	Viviparity *Vivipariti*	IV	High osmotic pressure in the cell sap *Tekanan osmosis dalam sap sel tinggi*

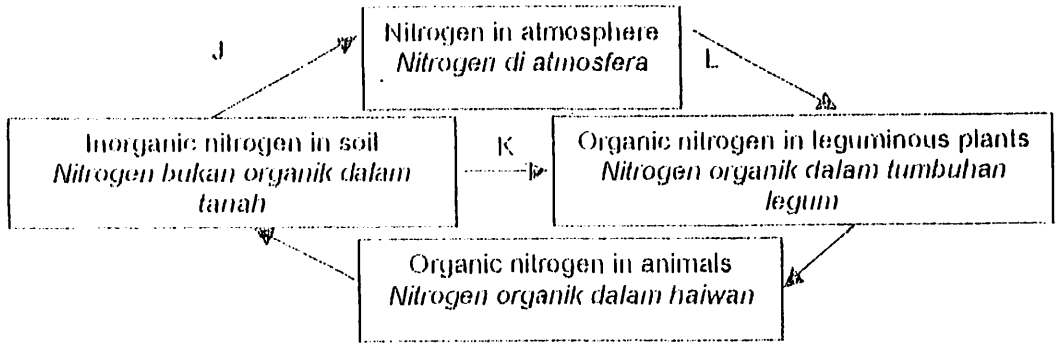
A I and II only
I dan II sahaja

B I and III only
I dan III sahaja

C I, II and III only
I, II dan III sahaja

D I, II and IV only
I, II dan IV sahaja

25 The chart shows the pathway of nitrogen cycle in leguminous plants.
Carta menunjukkan kitar nitrogen bagi tumbuhan legum.



What are the processes of J, K and L?
Apakah proses J, K dan L?

	J	K	L
A	Nitrification *Nitrifikasi*	Nitrogen fixation *Pengikatan nitrogen*	Denitrification *Denitrifikasi*
B	Nitrogen fixation *Pengikatan nitrogen*	Denitrification *Denitrifikasi*	Nitrification *Nitrifikasi*
C	Denitrification *Denitrifikasi*	Nitrification *Nitrifikasi*	Nitrogen fixation *Pengikatan nitrogen*
D	Denitrification *Denitrifikasi*	Nitrogen fixation *Pengikatan nitrogen*	Nitrification *Nitrifikasi*

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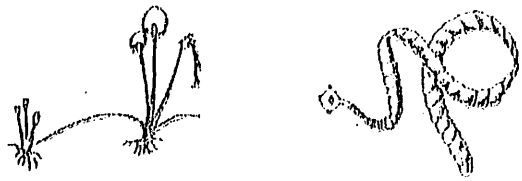
26 Which of the following is at the first trophic level in the pyramid number?
Antara berikut, yang manakah berada pada aras trofik pertama dalam piramid nombor?

A Grasshopper / *Belalang*
B Eagle / *Helang*
C Grass / *Rumput*
D Snake *Ular*

27 Diagram 18 shows the organisms P and Q.
Rajah 18 menunjukkan organisma P dan Q.



P Q

Diagram 18
Rajah 18

What is the feeding method for P and Q?
Apakah kaedah pemakanan bagi P dan Q?

	P	Q
A	Autotropic / *Autotropik*	Parasitic / *Parasitik*
B	Saprophytic / *Saprofitik*	Parasitic / *Parasitik*
C	Holozoic / *Holozoik*	Saprophytic / *Saprofitik*
D	Parasitic / Parasitik	Heterotropic / *Heterotropik*

28 Which of the following are the effects of ozone depletion?
Antara berikut yang manakah adalah kesan penipisan lapisan ozon?

I Melanoma
Melanoma
II Snow storms
Ribut salji
III Destruction of phytoplankton
Kemusnahan fitoplankton
IV The rate of photosynthesis increases
Kadar fotosintesis meningkat

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

[Lihat halaman sebelah

29 Diagram 19 shows the emission of various gases by a chemical factory in an industrial area.
Rajah 19 menunjukkan pengeluaran pelbagai jenis gas dari kilang kimia di suatu kawasan perindustrian.

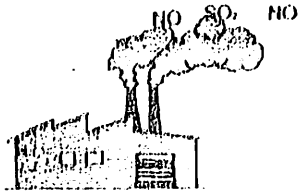


Diagram 19
Rajah 19

Which of the following phenomenon is the most likely to occur?
Antara fenomena di bawah yang manakah lebih kerap berlaku?

A Acid rain
Hujan asid

B Global warming
Pemanasan global

C Greenhouse effect
Kesan rumah hijau

D Thinning of ozone layer
Penipisan lapisan ozon

30 Which of the following is an effect of thermal pollution?
Yang manakah perkara di bawah adalah kesan pencemaran terma?

A Photosynthesis in aquatic plants inceases
Fotosintesis tumbuhan akuatik meningkat

B Growth rate in aquatic organisms increases
Kadar pertumbuhan organism akuatik meningkat

C Population of aquatic organism is reduced
Populasi organism akuatik berkurang

D Tropic level in a food chain increases
Aras trofik dalam rantai makanan meningkat.

[Lihat halaman sebelah

31 Which of the following causes eutrophication?
Manakah yang berikut menyebabkan eutrofikasi?

I Run-off of excess nutrients into pond
Pengaliran nutrient yang berlebihan ke dalam kolam

II Discharge of untreated sewage into water source
Pembuangan bahan kumbahan yang tidak dirawat ke dalam sumber air

III Increase in photosynthesis rate of aquatic plants
Peningkatan kadar fotosintesis tumbuhan akuatik

IV Inorganic fertilisers dissolve in soil water
Baja bukan organik larut dalam air tanah

A I, II and III only
I, II and III sahaja

B I, II and IV only
I, II dan IV sahaja

C I, III and IV only
I, III and IV sahaja

D II, III and IV sahaja
II, III dan IV sahaja

32 In an experiment to estimate the population of bat in a cave, a student obtained the following data.
Dalam eksperimen menganggar saiz populasi kelawar dalam sebuah gua, pelajar telah memperolehi data seperti berikut.

Bats caught and marked in the first catch *Kelawar ditangkap dan ditanda pada tangkapan pertama*	50
Bats caught in the second catch *Kelawar ditangkap pada tangkapan kedua*	40
Bats marked in the second catch *Kelawar bertanda pada tangkapan kedua*	8

Diagram 21
Rajah 21

What is the estimated of population size of bats in the cave?
Apakah anggaran saiz populasi kelawar dalam gua tersebut?

A 10

B 250

C 2000

D 2500

[Lihat halaman sebelah

33 Diagram 20 shows a longitudinal section of the human heart.
Rajah 20 menunjukkan suatu keratan membujur jantung manusia.

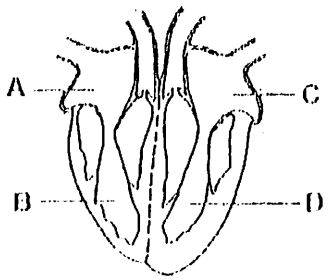


Diagram 20
Rajah 20

Which of the labeled parts A, B, C or D pumps blood to the lungs?
Antara bahagian berlabel A, B, C atau D yang manakah mengepam darah ke peparu?

34 Diagram 21 shows a structure of stoma.
Rajah 21 menunjukkan struktur stoma.

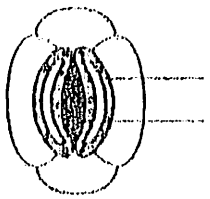


Diagram 21
Rajah 21

Which of the following factors will cause the stoma to open wider?
Antara faktor berikut, yang manakah akan menyebabkan stoma terbuka lebih luas?

I Starch content increases
Kandungan kanji bertambah

II Water diffuses into the guard cells
Air meresap masuk ke dalam sel pengawal

III The osmotic pressure of the guard cells increases
Tekanan osmosis sel pengawal meningkat

IV There is no light
Tiada cahaya

A II and III only
II dan III sahaja

B II and IV only
II dan IV sahaja

C III and IV only
III dan IV sahaja

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

[Lihat halaman sebelah

35 Diagram 22 shows a type of blood circulatory system.
Rajah 22 menunjukkan sejenis sistem peredaran darah.

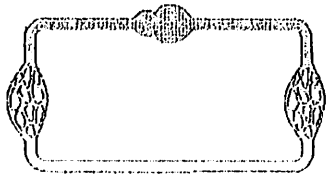


Diagram 22
Rajah 22

Which of the organism has the blood circulatory system in the diagram above?
Organisma manakah yang mempunyai sistem peredaran darah seperti rajah diatas?

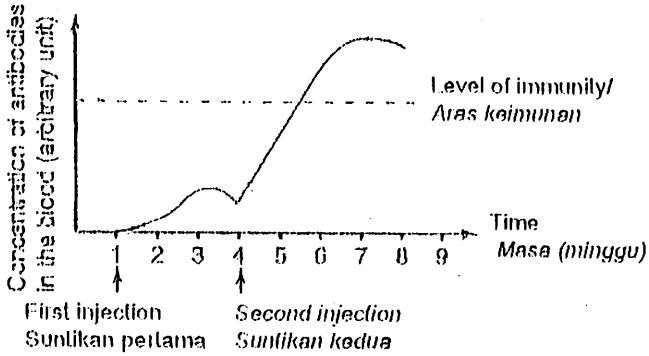
A Cockroach
Lipas

B Lizard
Cicak

C Penguin
Penguin

D Gold fish
Ikan emas

36 Graph 1 shows a type of immunity.
Graf 1 menunjukkan sejenis keimunan.



Graph 1
Graf 1

Which one of the following statements is true about the graph.
Antara pernyataan berikut,yang manakah benar tentang graf tersebut.

A Both injections contain serum that can raise antibody level.
Kedua-dua suntikan mengandungi serum yang boleh meningkatkan aras antibodi.

B Second injection is required to boost the level of immunity.
Suntikan kedua diperlukan untuk meningkatkan aras keimunan.

C Only the first injection contains pathogens that stimulate the production of antibody.
Hanya suntikan pertama mengandungi patogen yang merangsang penghasilan antibodi.

D Second injection contains higher level of antibody.
Suntikan kedua mengandungi aras antibody yang lebih tinggi.

[Lihat halaman sebelah

37 Diagram 23 shows a fish swimming.
Rajah 23 menunjukkan seekor ikan sedang berenang.

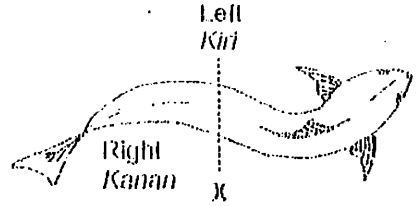


Diagram 23
Rajah23

Which of the following shows the muscles of the fish at the line labeled X?
Antara berikut, manakah menunjukkan otot-otot ikan pada garis berlabel X?

A

C

B

D

[Lihat halaman sebelah

38 Diagram 24 shows a motor neurone.
Rajah 24 menunjukkan neuron motor.

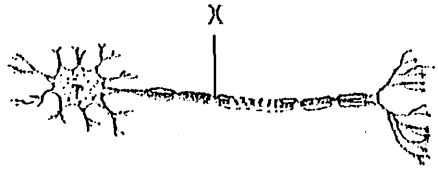


Diagram 24
Rajah 24

What is the function of the structure labeled X?
Apakah fungsi struktur berlabel X?

A To assist in the metabolism of the cell body
Untuk membantu metabolism badan sel

B To supply nutrients to the cell body
Untuk membekalkan nutrient ke badan sel

C To facilitate rapid transmission of impulses
Untuk membantu pemindahan impuls dengan lebih cepat

D To direct impulse towards one direction
Untuk mengarahkan pergerakan impuls satu hala

39 Diagram 25 shows human lumbar vertebrae.
Rajah 25 menunjukkan vertebra lumbar manusia.

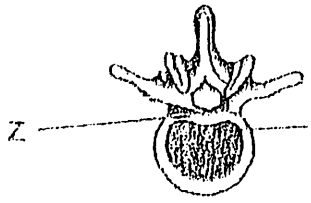


Diagram 25
Rajah 25

What is the function of Z?
Apakah fungsi Z?

A Protection for spinal cord
Perlindungan bagi saraf tunjang

B Surface for muscle attachment
Permukaan untuk perlekatan otot

C Surface to join with other vertebrae
Permukaan untuk persendian dengan vertebra lain

D Provides support and absorbs shock
Menyediakan sokongan dan menyerap gegaran

[Lihat halaman sebelah

40 Which of the following parameters cannot be detected by the receptors in the body?
Antara berikut, parameter yang manakah tidak dapat dikesan oleh reseptor di dalam badan.

A Blood pressure
Tekanan darah

B Body temperature
Suhu badan

C Partial pressure of carbon dioxide and oxygen
Tekanan separa karbon dioksida dan oksigen

D Amino acid level in blood
Aras asid amino darah

41 The following information is about a coordination and response.
Maklumat berikut adalah berkaitan dengan koordinasi dan gerakbalas.

A boy ran very fast when chased by a fierce dog.
Budak lelaki lari dengan pantas apabila dikejar anjing yang garang

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

A Metabolic rate decreases
Kadar metabolism menurun

B Rate of digestion increases
Kadar pencernaan meningkat

C Concentration of blood glucose increases
Kepekatan glukosa darah meningkat

D Amount of glucagon secreted decreases
Jumlah glukagon yang dirembes berkurang

42 Diagram 26 shows the stages in the development of a follicle in an ovary.
Rajah 26 menunjukkan peringkat perkembangan folikel di dalam ovari.

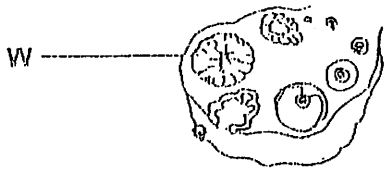


Diagram 26
Rajah 26

What is the hormone secreted by W?
Apakah hormon yang dirembeskan oleh W?

A Oestrogen
Estrogen

B Progesterone
Progesteron

C Luteinising hormone
Hormon peluteinan

D Follicle stimulating hormone
Hormon perangsang folike

[Lihat halaman sebelah

43 Diagram 27 shows the secretion of two types of hormones during the menstrual cycle in a female.
Rajah 27 menunjukkan rembesan dua jenis hormone semasa kitar haid seorang perempuan.

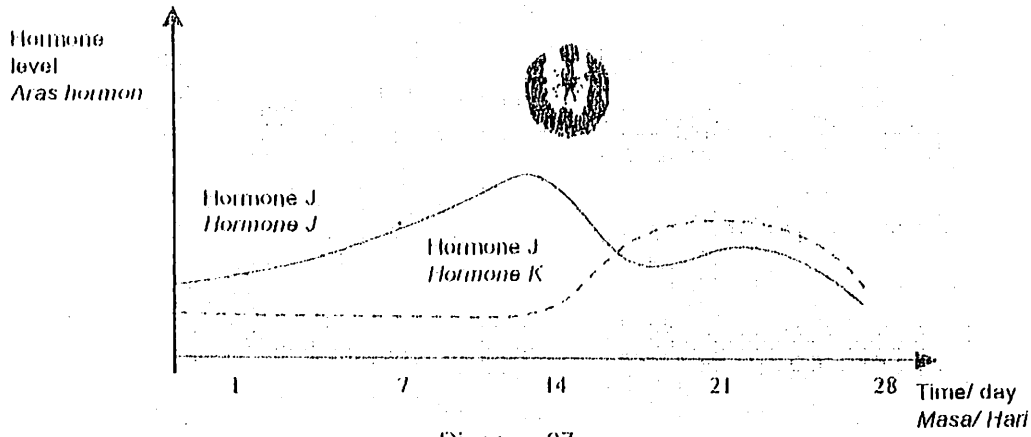


Diagram 27
Rajah 27

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

I A drop in the level of hormone J induces a drop in the level of hormone K
Penurunan aras hormon J merangsang penurunan aras hormon K

II A rise in level of hormone K stimulates ovulation
Peningkatan aras hormon K merangsang pengovulan

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

IV A rise in the level of hormone J repairs the endometrium lining
Peningkatan aras hormon J merangsang pembaikian lapisan endometrium

A I and II only
I dan II sahaja

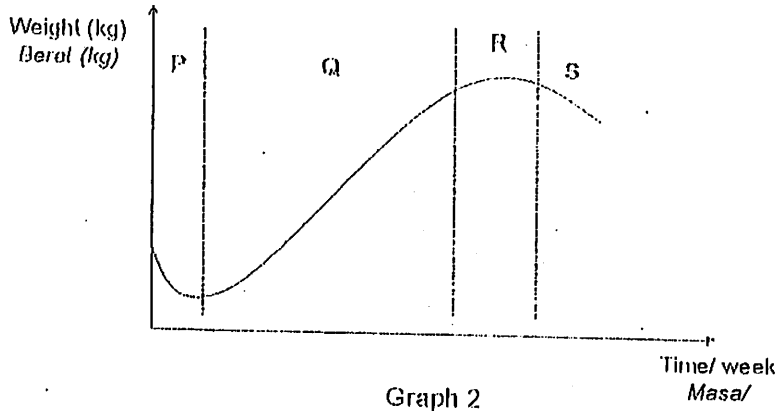
B I and IV only
I dan IV sahaja

C II and III only
II dan III sahaja

D III and IV only
III dan IV sahaja

[Lihat halaman sebelah

44 The graph 2 shows a sigmoid growth curve.
Graf 2 menunjukkan lengkung pertumbuhan sigmoid



Graph 2
Graf 2

Which statements about the growth are true?
Pernyataan yang manakah benar tentang pertumbuhan ?

I The growth rate is fastest at Q
Kadar pertumbuhan adalah paling cepat di Q

II The growth rate is slowest at R
Kadar pertumbuhan adalah paling perlahan di R

III The growth rate is negative at S
Kadar pertumbuhan negatif di S

IV The growth rate is constant at P
Kadar pertumbuhan adalah malar di P

A I and III only
I dan III sahaja

B I and IV only
I dan IV sahaja I,

C I, II and III only
I, II dan III sahaja

D I, III and IV only
III dan IV sahaja

[Lihat halaman sebelah

45 Diagram 28 shows the stages in the development of embryo of a human.
Rajah 28 menunjukkan peringkat-peringkat dalam perkembangan embrio manusia.

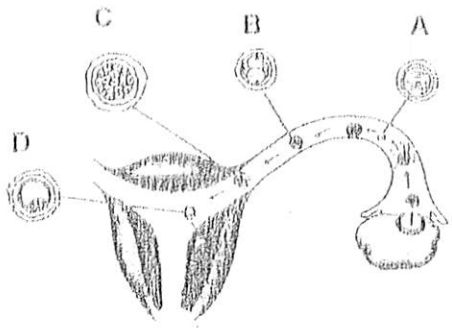


Diagram 28
Rajah 28

Which of the following labeled parts A, B, C and D is a morula stage?
Antara bahagian berlabel A,B,C dan D yang manakah peringkat morula?

46 Which of the following statements are true about double fertilisation in a plant?
Antara pernyataan berikut, yang manakah betul tentang persenyawaan gandadua pada tumbuhan.

I One male gamete nucleus fuses with the nucleus of an egg cell to form an embryo sac.
Satu nukleus gamet jantan bergabung dengan nukleus sel telur untuk membentuk pundi embrio.

II Two haploid nuclei formed in the ovule fuse with two male gamete nuclei.
Dua nukleus haploid dalam ovul bergabung dengan dua nukleus gamet jantan.

III One male gamete nucleus fuses with the female nucleus to form a diploid zygote.
Satu nukleus gamet jantan bergabung dengan nukleus betina untuk membentuk zigot yang diploid.

IV Two polar nuclei fuse with one male nucleus to form the endosperm.
Dua nukleus kutub bergabung dengab satu nukleus gamet jantan membentuk endosperma.

A I and II only
I dan II sahaja

B III and IV only
III dan IV sahaja

C I, II and III only
I, II dan III sahaja

D II, III and IV only
II, III dan IV sahaja

47 Diagram 29 shows genotype of offsprings from parent P and Q.
Rajah 29 menunjukkan genotip anak daripada induk P dan Q.

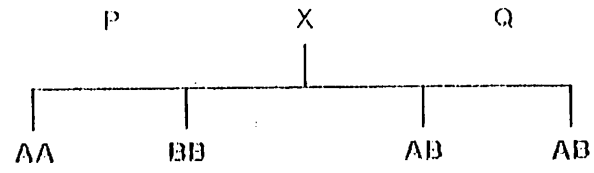


Diagram 29
Rajah 29

What is the possible genotype of P and Q?
Apakah kemungkinan genotip P dan Q?

	Parent P	Parent Q
A	AA	BB
B	AA	BO
C	AB	AB
D	AO	BO

48 Diagram shows the result of the monohybrid cross between trait rambutan tree P and rambutan tree Q, 50% of the offspring are tall and 50% are dwarf.
Rajah di bawah menunjukkan keputusan kacukan monohybrid bagi pokok rambutan P dan rambutan Q. 50% dari anak yang terhasil kesemuanya tinggi manakala 50% lagi kerdil.

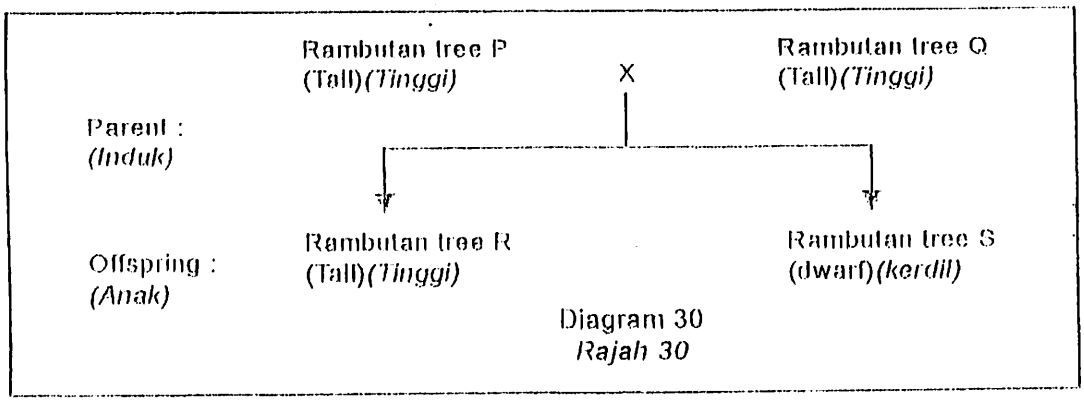


Diagram 30
Rajah 30

If the rambutan tree R is crossed with the rambutan tree S, what percentage of the trees produced will be dwarf?
Sekiranya pokok rambutan R dikacukkan dengan pokok rambutan S, apakah peratus anak yang terhasil adalah kerdil?

A 0 B 25 C 50 D 75

49 Diagram 31 shows the variation of blood groups in humans.
Rajah 31 menunjukkan variasi bagi kumpulan darah manusia.

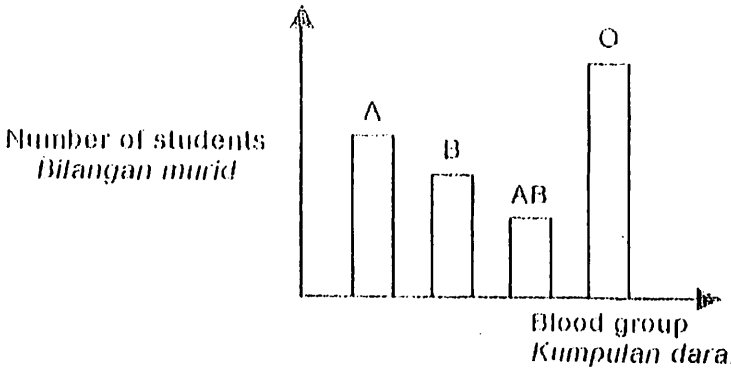


Diagram 31
Rajah 31

Which of the following is true about the variation of blood groups in humans?
Antara berikut yang manakah benar tentang variasi bagi kumpulan darah manusia?

A Influenced by environmental factors
Dipengaruhi oleh faktor persekitaran

B Controlled by one pair of alleles
Dikawal oleh satu pasang alel

C The differences in a character are not distinctive
Perbezaan ciri tidak jelas

D Cannot be measured from one character to another
Tidak dapat diukur dari satu ciri dengan ciri lain

[Lihat halaman sebelah

50 What are the uses of DNA fingerprinting?
Apakah kegunaan cap jari DNA?

I To help solve criminal cases
Untuk menyelesaikan kes-kes jenayah

II To produce genetically modified organisms
Untuk menghasilkan organisma ubahsuaian genetik

III To produce insulin
Untuk menghasilkan insulin

IV To help settle paternity disputes
Untuk mengesahkan ibubapa kandung

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

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

[Lihat halaman sebelah

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper comprises 50 questions
Kertas soalan ini mengandungi 50 soalan .

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

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

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

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

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

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

[Lihat halaman sebelah

NAMA : ..... KELAS:.....

4551/2
BIOLOGY/ P
Kertas 2
September 2011
2 ½ jam

BIOLOGY

KERTAS 2

Tingkatan 5

Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN SEHINGGA DIBERITAHU

1. Tulis nama dan kelas 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			
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		100	

Kertas ini mengandungi 28 halaman bercetak

[Lihat halaman sebelah

Section A
Bahagian A

[60 marks]
[60 markah]

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

1 Diagram 1 shows the structure of a plant cell.

Rajah 1 menunjukkan struktur satu sel tumbuhan.

For Examiner Use

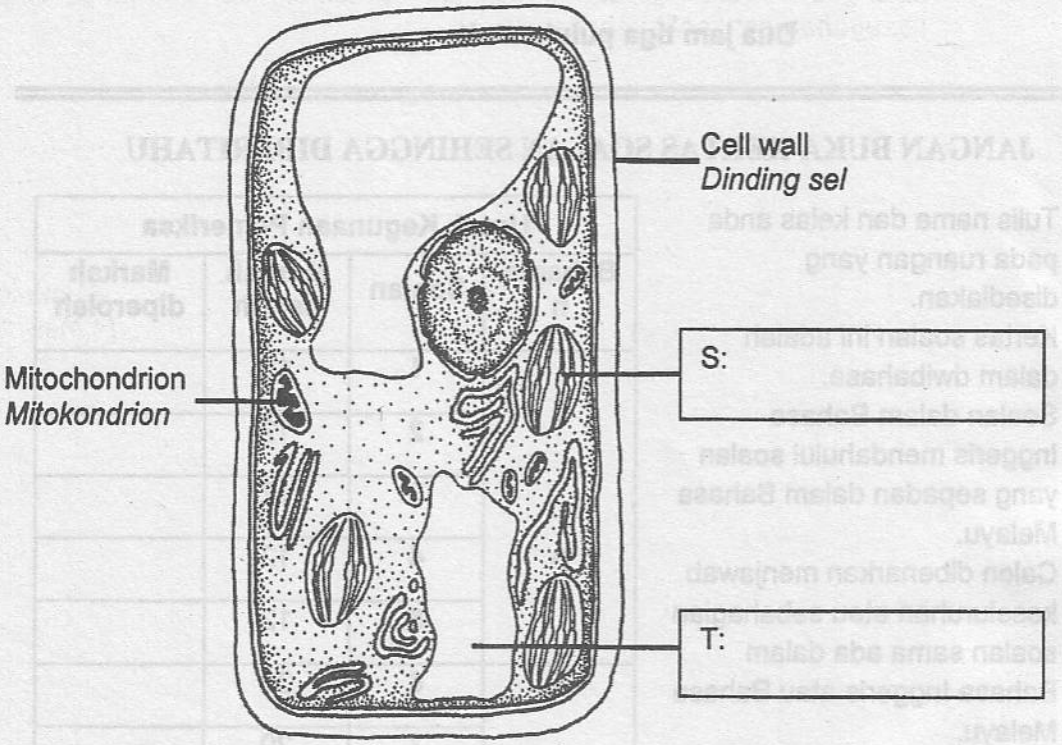


Diagram 1
Rajah 1

(a) (i) In Diagram 1, label S dan T.

Pada Rajah 1, labelkan S dan T

[2 marks]
[2 markah]

1ai

2

For Examiner's Use

1aii

2

(ii) State the function of structure S and cell wall.

Nyatakan fungsi struktur S dan dinding sel.

S:.....

T:.....

[2 marks]
[2markah]

(b) Explain structure T and how it is involved to maintain the turgiditiy of plant cell.

Terangkan struktur T dan bagaimana ia terlibat dalam mengekalkan kesegahan satu sel tumbuhan.

1b

4

.....

.....

.....

.....

[4 marks]
[4 markah]

For Examiner' Use

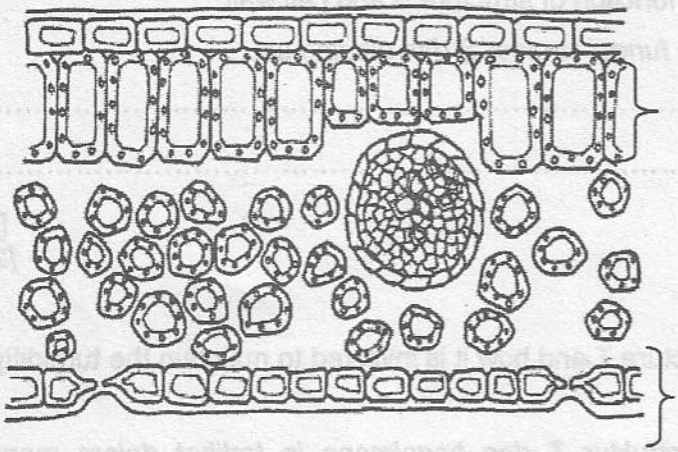


Diagram 1.1
Rajah 1.1

(c) Diagram 1.1 above shows the cross section of a leaf. Based on the diagram, explain the adaptations of the leaf to carry out photosynthesis.

Rajah 1.1 menunjukkan keratan rentas daun. Berdasarkan rajah tersebut, terangkan penyesuaian-penyesuaian daun untuk menjalankan proses fotosintesis.

.....

.....

.....

.....

[4 marks]
[4 markah]

1c

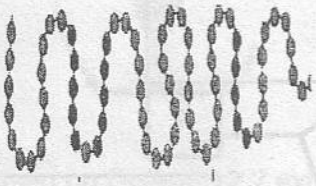
4

Total A1

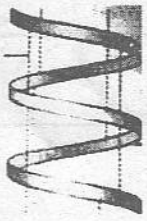
12

2 Diagram 2 shows the various structures of protein

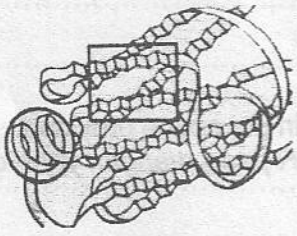
Rajah 2 menunjukkan pelbagai stuktur protein.



K



L



M

N

Diagram 2

Rajah 2

(a) Based on Diagram 2, state the structures of protein for K, L, M and N in Table 2 below.

Berdasarkan Rajah 2, nyatakan struktur protein bagi K, L, M dan N dalam Jadual 2 di bawah.

2a

2

Huruf *Alphabets*	Name of protein structure *Nama struktur protein*
K	
L	
M	
N	

Table 2

Jadual 2

[2 marks]

[2 markah]

For Examiner's Use

(b) Diagram 2.1 shows a nucleotide from protein structure of L.

Rajah 2.1 menunjukkan satu nukleotida dari struktur protein L.

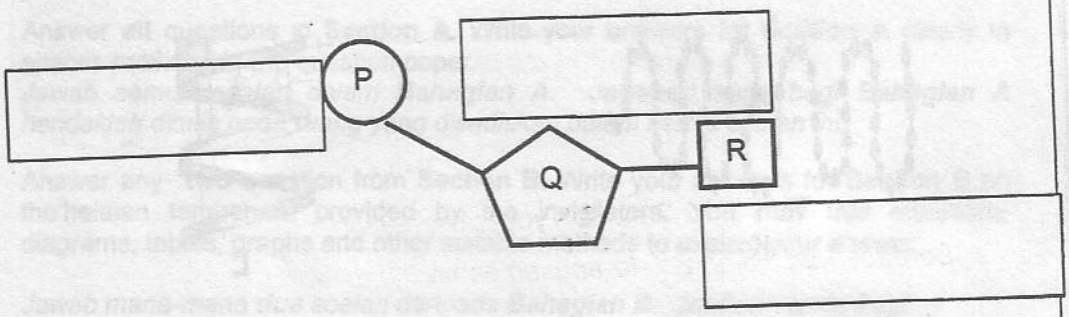


Diagram 2.1
Rajah 2.1

2bi

(i) In Diagram 2.1, label P, Q and R in the space provided.
Dalam Rajah 2.1, label P, Q dan R pada ruangan yang disediakan.
[3 marks]
[3 markah]

3

2bii

(ii) State **two** examples of secondary protein structure.

*Nyatakan **dua** contoh struktur protein sekunder.*

.....
[2 marks]
[2 markah]

2

(c) When a sliced apple is exposed to air, an enzyme in the apple starts a chemical reaction which causes the apple to turn brown. Diagram 2.2 shows the observation made on the sliced apple before and after a treatment as follows:

Part X : Soaked in an alkali
Part Y : Soaked in a distilled water

Bila sepotong epal didedahkan kepada udara, terdapat enzim di dalam epal memulakan tindakbalas kimia yang menyebabkan epal bertukar menjadi perang. Rajah 2.2 menunjukkan pemerhatian yang telah dibuat ke atas potongan epal tersebut sebelum dan selepas rawatan seperti berikut:

Bahagian X : Direndam dalam alkali
Bahagian Y : Direndam dalam air suling

For Examiner's Use

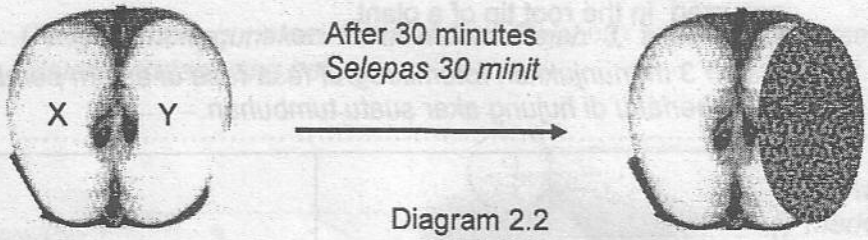


Diagram 2.2
Rajah 2.2

(i) Based on Diagram 2.2 explain your observation.

Berdasarkan Rajah 2.2, terangkan pemerhatian anda.

.....

.....

.....

.....

2ci

3

[3 marks]
[3markah]

(ii) Explain a treatment to prevent sliced apples from turning brown.

Terangkan satu rawatan untuk mengelakkan potongan epal menjadi perang.

.....

.....

.....

2cii

2

[2 marks]
[2markah]

Total A2

12

For Examiner's Use

3. Diagram 3 shows photomicrograph the phases in a cell division that occurred in the root tip of a plant.

Rajah 3 menunjukkan fotomikrograf fasa-fasa di dalam pembahagian sel yang berlaku di hujung akar suatu tumbuhan.

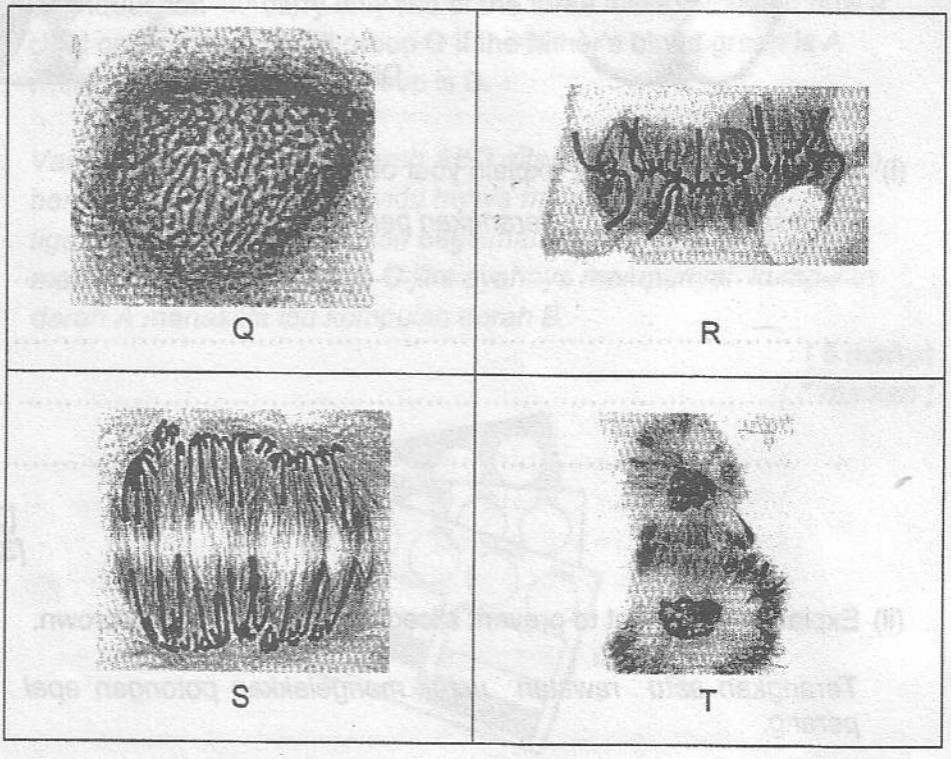


Diagram 3
Rajah 3

3ai

(a) (i) Name the type of cell division involved in Diagram 3

Namakan jenis pembahagian sel yang terlibat dalam Rajah 3

.....

[1 mark]
[1 markah]

3aii

(ii) State one reason for your answer in (a) (i)

Nyatakan satu sebab untuk jawapan anda dalam (a) (i).

.....

[1 mark]
[1 markah]

For Examiner's Use

(iii) By using letters in Diagram 3, arrange the phases in correct order.

Dengan menggunakan huruf dalam Rajah 3, susun fasa tersebut dalam turutan yang betul.

.....

[1 mark]
[1 markah]

3aiii

1

(b) Explain why root tip is used for preparing slides to show this cell division.

Terangkan mengapa hujung akar ini digunakan untuk menyediakan slaid untuk menunjukkan pembahagian sel ini.

.....

.....

.....

[2 marks]
[2 markah]

3b

2

For Examiner's Use

(c) Diagram 3.1 shows two cell division processes U and V in two different types of cell.

Rajah 3.1 menunjukkan dua proses pembahagian sel iaitu U dan V yang berlaku dalam dua jenis sel.

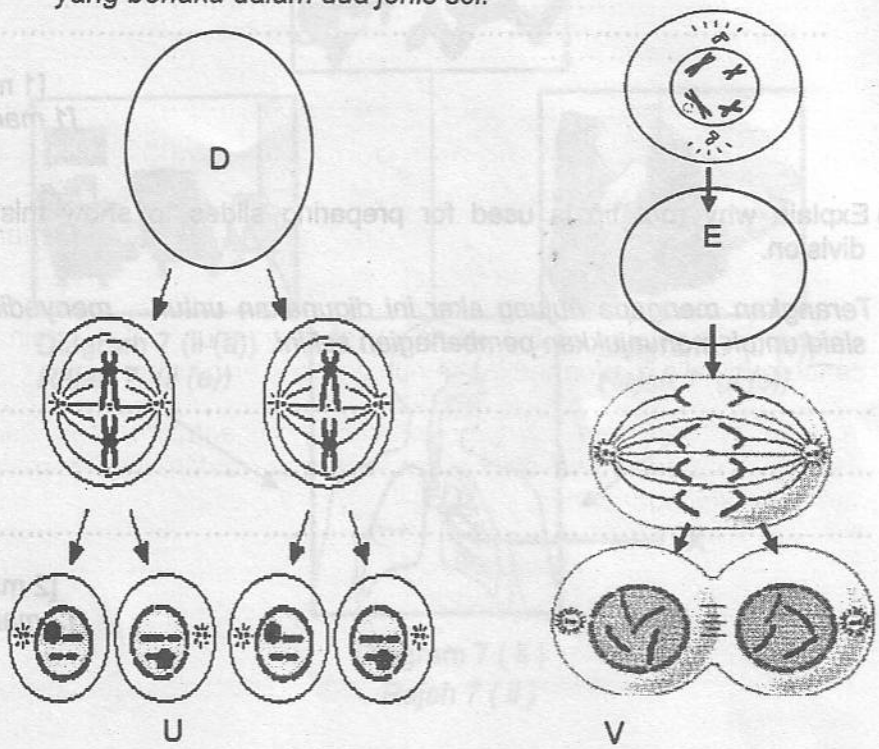


Diagram 3.1
Rajah 3.1

(i) Draw the chromosomes behavior in stages D and E in the space provided.
Lukiskan perlakuan kromosom di peringkat D dan E di ruangan yang disediakan.

D	E

[2 marks]
[2 markah]

For Examiner Use

[Lihat halaman sebelah

(ii) State the differences between processes U and V.

Nyatakan perbezaan-perbezaan di antara proses U dan V.

.....

.....

.....

.....

3cii

2

[2 marks]
[2 markah]

(d) Process V is related to the formation of cancerous cell. Explain how cancerous cells are formed in the human body and its prevention.

Proses V berkaitan dengan proses pembentukan sel kanser. Terangkan bagaimana sel kanser terbentuk dalam badan manusia dan cara pencegahannya.

3d

3

.....

.....

.....

[3 marks]
[3 markah]

Total A3

12

For Examiner's Use

4. Diagram 4 shows a pond ecosystem.

Rajah 4 menunjukkan satu ekosistem kolam.

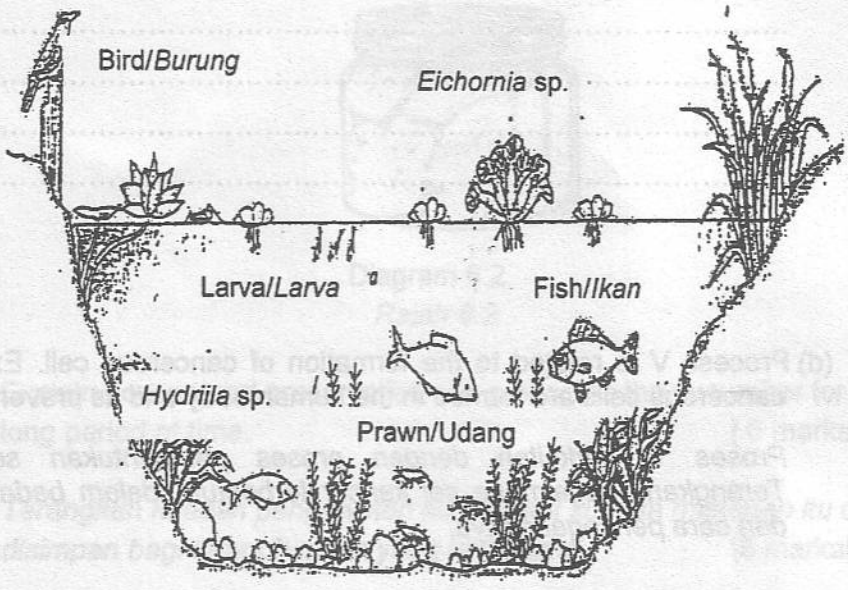


Diagram 4
Rajah 4

(a) Based on Diagram 4 above,
Berdasarkan Rajah 4 di atas

(i) construct a food chain that consists of three trophic levels.
bina satu rantai makanan yang terdiri daripada tiga aras trof.

4ai

2

[2 marks]
[2 markah]

For Examiner's Use

(ii) choose one abiotic factor and explain how its effect to biotic factor.

Pilih satu faktor abiotik dan terangkan bagaimana ia memberikan kesan ke atas faktor biotik.

.....

.....

.....

.....

4aii

2

[2 marks]
[2 markah]

(b) Diagram 4.1 shows the energy flow from one trophic level to the next.

Rajah 4.1 menunjukkan aliran tenaga dari satu aras trof ke aras trof yang berikutnya.

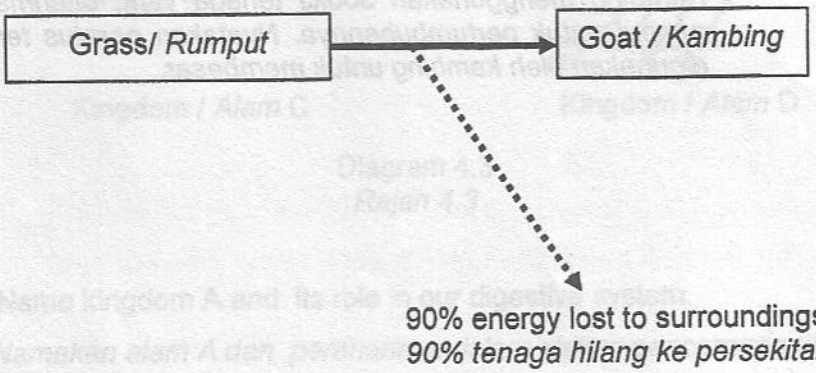


Diagram 4.1
Rajah 4.1

Based on Diagram 4.1,

Berdasarkan kepada Rajah 4.1,

(i) State how energy is lost to surroundings.

Nyatakan bagaimana tenaga boleh hilang ke persekitaran.

.....

4bi

1

[1 mark]
[1 markah]

For Examiner's Use

(ii) The grass contains 3100 kJ energy. Calculate the total energy received by the goat.

Rumput mengandungi 3100kJ tenaga. Kira jumlah tenaga yang diterima oleh kambing.

4bii

2

[2 marks]
[2 markah]

(iii) The goat uses 300kJ energy received from the grass for its growth. State the percentage of energy used by the goat to grow.

Kambing menggunakan 300kJ tenaga yang diterima daripada rumput untuk pertumbuhannya. Nyatakan peratus tenaga yang digunakan oleh kambing untuk membesar.

4biii

1

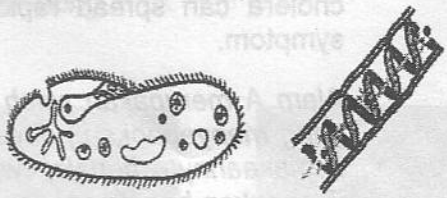
[1 mark]
[1 markah]

For Examiner's Use

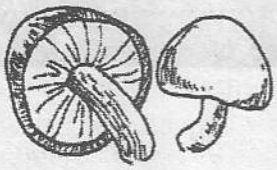
(c) Diagram 4.3 shows organisms in four out of five kingdoms.

Rajah 4.3 menunjukkan organism di dalam empat daripada lima alam.

Kingdom / *Alam* A



Kingdom / *Alam* B



Kingdom / *Alam* C

Kingdom / *Alam* D

Diagram 4.3
Rajah 4.3

4ci

(i) Name kingdom A and its role in our digestive system.

Namakan alam A dan peranannya dalam sistem pencernaan kita.

.....

.....

[2 marks]
[2 markah]

2

For examiner's Use

4cii

2

Total A4

12

(ii) Kingdom A is one of the microorganisms. The harmful microorganism which can cause diseases is called pathogen. After flood normally cholera can spread rapidly. Explain how cholera spread and its symptom.

Alam A merupakan salah satu jenis mikroorganisma. Mikroorganisma yang menyebabkan penyakit dikenali sebagai patogen. Selepas banjir kebiasaannya berlaku wabak taun yang merebak dengan cepat. Terangkan bagaimana taun merebak dan simptomnya.

.....

.....

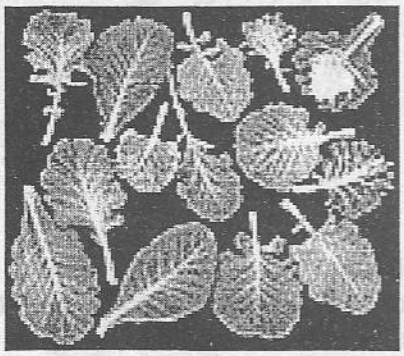
.....

[2 marks]
[2 markah]

For Examiner's Use

5. Diagram 5.1 (i) and (ii) show the leaves plucked from a plant and ear lobes of human respectively.

Rajah 5.1 (a) dan (b) menunjukkan helaian daun yang dipetik dari pokok dan cuping telinga manusia masing-masing.



(i)

(ii)

Diagram 5.1
Rajah 5.1

(a) State the types of variation shown in Diagram 5.1 (i) and (ii).

Nyatakan jenis variasi yang ditunjukkan dalam Rajah 5.1(i) dan (ii)

(i) .....

(ii) .....

[2 marks]
[2 markah]

5a

2

(b) Give other examples of variation that you have named in question 5 (a) above.

Berikan contoh lain dalam variasi yang telah anda nyatakan dalam soalan 5 (a) di atas.

(i) .....

(ii) .....

[2 marks]
[2 markah]

5b

2

For Examiner's Use

5c

2

(c) State two differences for both variations.

Nyatakan dua perbezaan untuk kedua-dua jenis variasi tersebut.

.....

.....

(i) .....

.....

[2 marks]
[2 markah]

(d) Genetic variation in offspring is influenced by genetic factors. Diagram 5.2 shows four possible gametes with different genetic combinations produced which is one of the factor.

Variasi genetik dalam anak dipengaruhi oleh faktor genetik. Rajah 5.2 menunjukkan hasil empat gamet dengan pelbagai kombinasi genetik.di mana ia merupakan salah satu faktor.

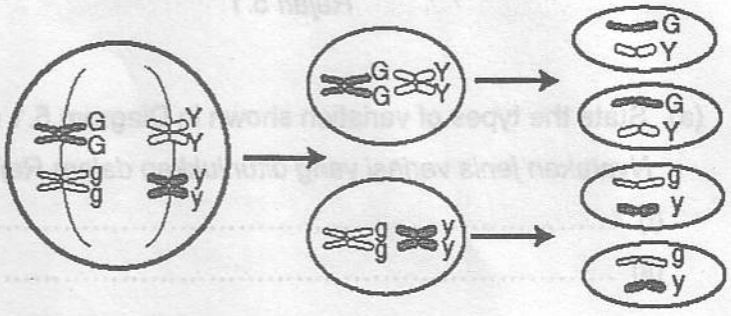


Diagram 5.2
Rajah 5.2

Based on Diagram 5.2, explain the genetic factor. *Berdasarkan Rajah 5.2, terangkan faktor genetik tersebut.*

5d

2

.....

.....

.....

.....

[2 marks]
[2 markah]

For Examiner's Use

(e) Diagram 5.3 shows errors which lead to changes in the base sequence of the DNA that finally will cause mutation.

Rajah 5.3 menunjukkan kesilapan yang menyebabkan perubahan dalam urutan bes pada DNA dan menyebabkan akhirnya berlaku mutasi.

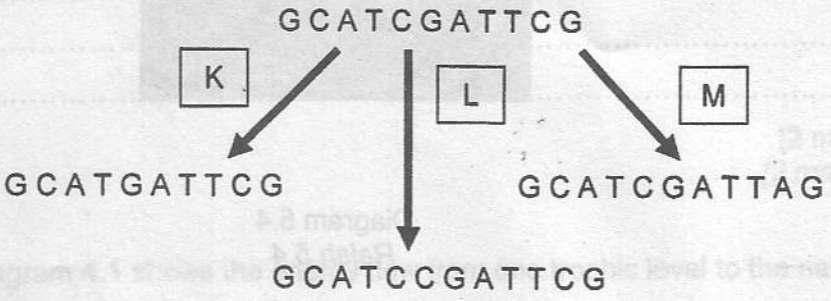


Diagram 5.3
Rajah 5.3

(i) Explain the mutation involved process M.

Terangkan mutasi yang melibatkan proses M seperti Rajah 5.3 di atas.

.....

.....

.....

.....

5ei

2

[2 marks]
[2 markah]

For Examiner's Use

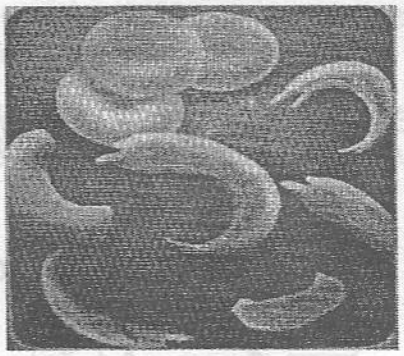


Diagram 5.4
Rajah 5.4

5eii

2

(ii) Mutation may occur on a recessive or dominant gene. Diagram 5.4 shows blood smear with different condition of red blood cells because of a disease. Explain the disease.

Mutasi boleh berlaku pada gen resesif atau dominan. Rajah 5.4 menunjukkan keadaan sel darah merah yang berbeza kerana sejenis penyakit. Terangkan penyakit tersebut.

.....

.....

[2 marks]
[2 markah]

Total A5

12

Section B

Bahagian B

[40 marks]
[40 markah]

Answer any **two** questions.
*Jawab mana-mana **dua** soalan*

6 Diagram 6 (i) shows the structure of plasma membrane. The plasma membrane is said to be selective permeable.

Rajah 6 (i) menunjukkan membran plasma. Membran plasma dikatakan bersifat ketelapan memilih.

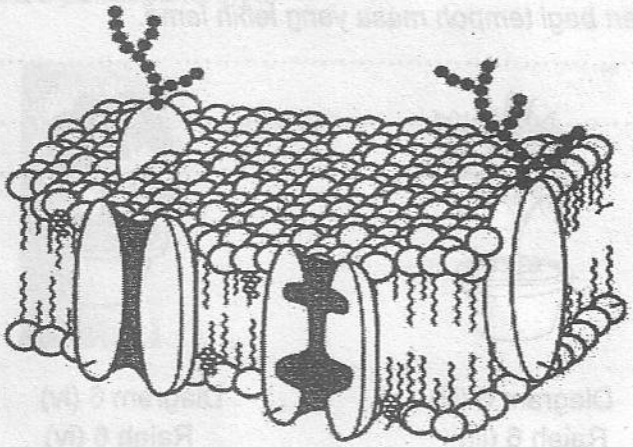


Diagram 6.1
Rajah 6.1

a) Based on the plasma membrane structure, explain the meaning of 'selective permeable'. [6 marks]

Berdasarkan struktur membran plasma , terangkan maksud `ketelapan memilih'. [6 markah]

b) Diagram 6.2 show a bottle of pickled cucumber.
Rajah 6.2 menunjukkan sebotol jeruk timun.

Diagram 6.2
Rajah 6.2

Explain how natural preservation can preserves the cucumber for a long period of time. [6 marks]

Terangkan kaedah pengaweten semulajadi supaya makanan itu dapat disimpan bagi tempoh masa yang lebih lama. [6 markah]

Diagram 6 (iii)
Rajah 6 (iii)

Diagram 6 (iv)
Rajah 6 (iv)

c) Diagram 6 (iii) shows a well-watered plant. Diagram 6 (iv) shows the same plants have not been watered for a week. Based on biological knowledge, explain what happens to the plants in diagrams 6(iii) and 6(iv).

Rajah 6(iii) menunjukkan pokok yang telah disiram dengan air yang secukupnya. Rajah 6(iv) menunjukkan pokok yang tidak disiram selama 1 minggu. Berdasarkan pengetahuan biologi, terangkan apa yang berlaku pada pokok di dalam rajah 6(iii) dan rajah 6 (iv) .

[8 marks]
[8 markah]

7 a) Diagram 7 (i) show the respiratory structures of human.
Rajah 7 (i) menunjukkan struktur respirasi bagi manusia.

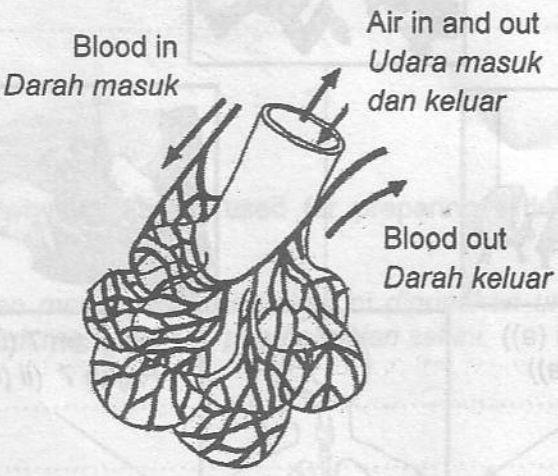


Diagram 7 (i)
Rajah 7 (i)

Describe the adaptation of respiratory structures for gaseous exchange.

Huraikan penyesuaian struktur respirasi untuk pertukaran gas.

[3 marks]
[3 markah]

b) During vigorous activities such as swimming, running and aerobic, the breathing rate increases to about 30 breath per minute while the heartbeat rate increases to 120 beats per minute. Explain how the body regulates the carbon dioxide content in human body.

Semasa menjalankan aktiviti cergas seperti berenang, berlari dan senamrobik , kadar pernafasan meningkat sehingga 30 pernafasan per minit manakala kadar degupan jantung meningkat sehingga 120 degupan per minit. Terangkan bagaimana mekanisme kawal atur karbon dioksida di dalam badan manusia.

[7 marks]
[7 markah]

[Lihat halaman sebelah

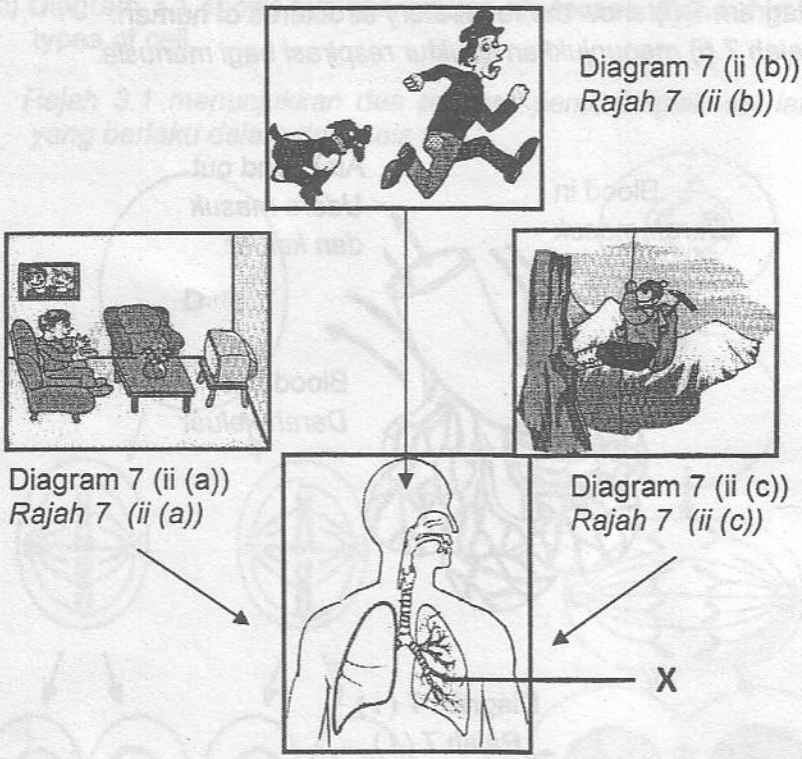


Diagram 7 (ii (b))
Rajah 7 (ii (b))

Diagram 7 (ii (a))
Rajah 7 (ii (a))

Diagram 7 (ii (c))
Rajah 7 (ii (c))

Diagram 7 (ii)
Rajah 7 (ii)

c) Diagram 7 (ii) shows 3 different situations of human activities.
Diagram 7 (ii (a)) shows a boy watching television.
Diagram 7 (ii (b)) shows a man is chased by a fierce dog.
Diagram 7 (ii (c)) shows a man climbing a mountain.
Explain the effects of the 3 different situations towards the physiological process that occur in organ X as shown in Diagram 7 (ii).

Rajah 7 (ii) menuniukkan 3 situasi aktiviti manusia yang berbeza.
Rajah 7 (ii((a)) menunjjukkan seorang budak lelaki sedang menonton televisyen.
Rajah 7(ii (b)) menunjukkan seorang lelaki sedang dikejar oleh anjing yang garang.
Rajah 7(ii (c)) menunjukkan seorang lelaki sedang mendaki gunung.
Terangkan kesan-kesan 3 situasi tersebut terhadap proses fisiologi yang berlaku di dalam organ X, seperti yang ditunjukkan di dalam rajah 7 (ii).

[10 marks]

[10 markah]

[Lihat halaman sebelah

8 a)

> The developing foetus is nourish and protected in the mother's uterus.
>
> *Fetus yang sedang berkembang dibekalkan dengan bahan-bahan keperluan dan dilindungi di dalam uterus ibunya.*

Explain the above statement.

Terangkan pernyataan di atas.

[10 marks]
[10 markah]

b) A married couple want to have a baby. But, he's wife has fallopian tubes blocked problem, it make impossible for her to conceive through the natural process. They insist to have their own child. Describe **one** modern technique that may be able to help this couple to have their own child. Explain the moral issues related to the suggested technique.

*Sepasang suami isteri ingin mempunyai anak. Namun, isteri beliau mempunyai masalah tiub fallopian tersumbat dan menjadikan beliau sukar untuk hamil secara semulajadi. Mereka menginginkan anak sendiri. Huraikan **satu** teknik moden yang boleh membantu pasangan tersebut untuk mendapatkan anak sendiri. Terangkan isu moral yang berkaitan dengan teknik yang dicadangkan.*

[10 marks]
[10 markah]

9 a i) What is the mean by codominance ?
Apakah yang dimaksudkan dengan kodominan ?

The variation of ABO blood group by three different alleles, but an individual can carry only two of the three alleles. Explain how a child could inherit blood group O if the father's blood group is A while the mother's blood group is B.

Variasi dalam kumpulan darah ABO ditentukan oleh tiga alel yang berbeza , tetapi setiap individu hanya membawa dua daripada tiga alel tersebut. Terangkan bagaimana seorang anak boleh mewarisi kumpulan darah O jika ayahnya mempunyai kumpulan darah A manakala ibu kumpulan darah B.

[6 marks]
[6 markah]

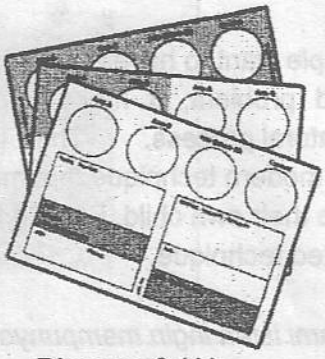


Diagram 9 (i)
Rajah 9 (i)

ii) Diagram 9 (i) shows examples of Eldoncard blood group test to determine a person's blood groups in minutes. Maria's blood group is B while her mother's blood group is AB. Maria lost plenty of blood during an accident. She needs to replace the blood lost. Her mother is disappointed when she was told that she cannot help her daughter. Explain why her mother is not a compatible donor to Maria.

Kumpulan darah Maria ialah B manakala kumpulan darah ibu Maria ialah AB. Maria kehilangan banyak darah dalam satu kemalangan dan memerlukan penderma darah bagi menggantikan darah yang hilang. Ibunya berasa kecewa apabila diberitahu bahawa beliau tidak boleh membantu anak perempuannya itu. Terangkan mengapa ibunya bukan penderma yang sesuai kepada Maria.

[4 marks]
[4 markah]

b) Diagram 9 (ii) show the DNA fingerprinting process. DNA fingerprinting is one of contribution of genetic engineering. It's helps people to solve crime investigation or to settle dispute over parentage.

Rajah 9 (ii) menunjukan proses cap jari DNA.Cap jari DNA adalah salah satu sumbangan kejuruteraan genetik. Ia membantu manusia dalam menyelesaikan kes-kes jenayah dan permasalahan keturunan.

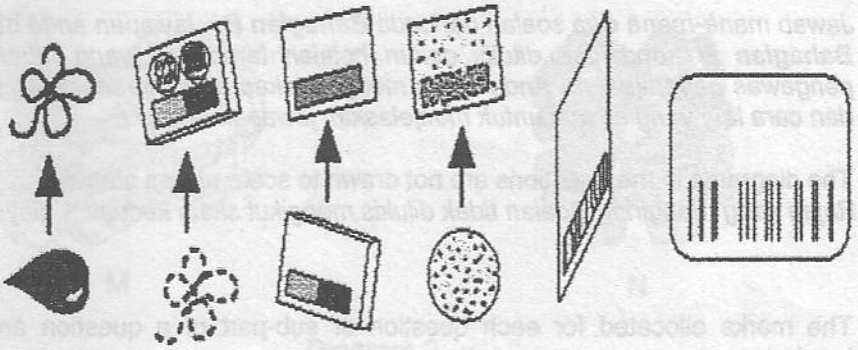


Diagram 9 (ii)
Rajah (ii)

Describe how the process of DNA fingerprinting. Discuss the disadvantages of genetic engineering towards mankind.

Huraikan bagaimana proses cap jari DNA dijalankan. Bincangkan keburukan kejuruteraan genetik terhadap manusia.

[10 marks]
[10 markah]

END OF QUESTION PAPER

KERTAS SOALAN TAMAT

MAKLUMAT KEPADA CALON

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

2. Answer **all** questions in **Section A**. Write your answers for **Section A** clearly in spaces provided in the question paper.
   *Jawab semua soalan dalam **Bahagian A**. Jawapan anda bagi **Bahagian A** hendaklah ditulis pada ruang yang disediakan dalam kertas soalan ini.*

3. Answer any **two** question from **Section B.** Write your answers for **Section B** on the'helaian tambahan' provided by the invigilators. You may use equations, diagrams, tables, graphs and other suitable methods to explain your answer.

   *Jawab mana-mana **dua** soalan daripada **Bahagian B**. Jawapan anda bagi **Bahagian B** hendaklah ditulis dalam helaian tambahan yang dibekalkan oleh pengawas peperiksaan. Anda boleh menggunakan persamaan, rajah, jadual, graf, dan cara lain yang sesuai untuk menjelaskan jawapan anda.*

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

5. The marks allocated for each question or sub-part of a question are shown in brackets.
   Markah yang diperuntukan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan.

6. If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.
   Jika anda hendak menukar jawapan, batalkan jawapan yang telah dibuat. Kemudian tulis jawapan yang baru.

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

8. You are advised to spend 90 minute to answer question in **Section A** and 60 minutes for **Section B**.
   *Anda dinasihati supaya mengambil masa 90 minit untuk menjawab soalan dalam **Bahagian A** dan 60 minit untuk **Bahagian B.***

9. Detach **Section B** from this question paper. Tie the 'helaian tambahan' together with this question paper and hand in to the invigilator at the end of the examination.

   *Ceraikan **Bahagian B** daripada kertas soalan ini. Ikat helaian tambahan bersama-sama kerts soalan ini dan serahkan kepada pengawas peperiksaan pada akhir peperiksaan.*

[Lihat halaman sebelah

NAMA : .....

TINGKATAN : .....

4551/3
BIOLOGY/ P
Kertas 3
SEPT 2011
1 ½ jam

BIOLOGY
Tingkatan 5
Kertas 3

Satu jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tulis* **nama** *dan* **tingkatan** *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		
Soalan	Markah penuh	Markah diperolehi
1	33	
2	17	
Jumlah	50	

Kertas soalan ini mengandungi 11 halaman bercetak

Answer **all** questions

*Jawab **semua** soalan*

1 An experiment was carried out to investigate the population size of garden snail in two different areas.

In this experiment, a group of students is estimating the population size of garden snail in a vegetable farm and school field. The technique used by the students to estimate the population size of garden snail is capture, mark, release and recapture

In the first visit, 15 garden snails were captured from each place. Each snail was marked by using water proof marker pen on the shell. All the garden snails were released back to the place where the snails were captured. After three days , the group of students recaptured a number of snails. They counted the total number of garden snails in the second capture. They also counted the marked garden snails in this second capture.

Satu eksperimen telah dijalankan untuk mengkaji saiz populasi siput babi di dua kawasan berbeza.

Dalam eksperimen ini, sekumpulan pelajar sedang menganggarkan saiz populasi siput babi di kebun sayur dan padang sekolah. Teknik yang telah digunakan untuk membuat anggaran populasi siput babi adalah kaedah tangkap, tanda, lepas dan tangkap semula.

Dalam lawatan pertama, pelajar telah menangkap sebanyak 15 ekor siput babi. Setiap siput babi ditandakan dengan pen penanda yang kalis air pada cangkerangnya . Kesemua siput babi tersebut dilepaskan semula di tempat siput itu ditangkap. Selepas tiga hari, kumpulan pelajar ini menangkap semula sebilangan siput babi di kedua-dua kawasan. Mereka mengira jumlah siput babi dalam tangkapan kedua itu. Mereka juga mengira siput babi yang bertanda yang ditangkap dalam tangkapan kedua.

Unmarked garden snail
Siput babi tidak bertanda

Marked garden snail
Siput babi bertanda

Diagram 1
Rajah 1

Table 1 shows the number of garden snail in the second capture for the vegetable farm and school field.
Jadual 1 menunjukkan bilangan siput babi dalam tangkapan pertama dan kedua untuk kebun sayur dan padang sekolah

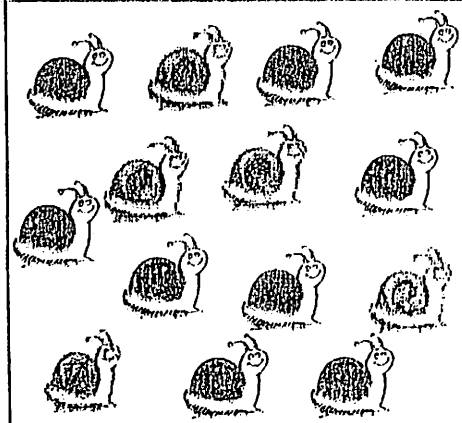
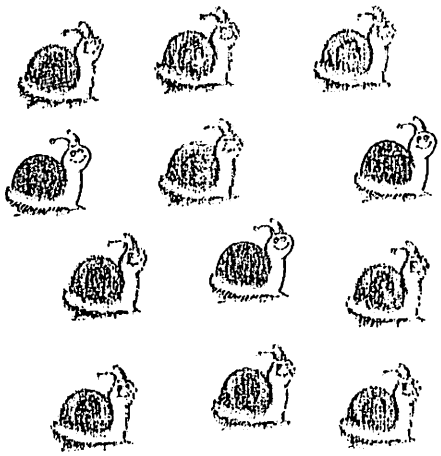
Area of garden snail captured *Kawasan tangkapan siput babi*	Garden snail in second capture *Siput babi dalam tangkapan kedua*	Number of garden snail in the second captured *Bilangan siput babi dalam tangkapan kedua*	Number of garden snail marked in the second capture *Bilangan siput babi yang berlanda dalam tangkapan kedua*
Vegetable farm *Kebun sayur*			
School field *Padang sekolah*			

Table 1
Jadual 1

For Examiner's Use

1 (a) Record the number of garden snail marked in the second captured in space in Table 1. [3 marks]

Rekodkan bilangan siput babi yang bertanda dalam tangkapan kedua dalan ruang yang disediakan dalam Jadual 1. [3 markah]

1 (a)

3

(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 :

.....

.....

[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 2 based on this experiment.

Lengkapkan Jadual 2 berdasarkan eksperimen ini.

For Examiner's Use

Variables *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]

[3 markah]

1(c)

3

(d) State the hypothesis for this experiment.

Nyatakan hipotesis bagi eksperimen ini.

.....

.....

.....

[3 marks]

[3 markah]

1(d)

3

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 dikumpulkan dalam eksperimen ini.

Your table should have the following titles:

Jadual anda hendaklah mengandungi tajuk-tajuk berikut:

- Catchment area of the garden snail

  Kawasan tangkapan siput babi
- Number of garden snails in the first capture

  Bilangan siput babi dalam tangkapan pertama
- Number of garden snails in the second capture

  Bilangan siput babi dalam tangkapan kedua
- Number of marked garden snails in the second capture

  Bilangan siput babi yang bertanda dalam tangkapan kedua
- Population Size of garden snail

  Populasi siput babi

Use the formula:

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

$$\textit{Saiz Populasi siput babi} = \frac{\textit{Bilangan siput babi dalam tangkapan pertama} \times \textit{Bilangan siput babi dalam tangkapan kedua}}{\textit{Bilangan siput babi yang bertanda dalam tangkapan kedua}}$$

[3 marks]

[3 markah

1 (e)(i)

3

For Examiner's Use

(e) (ii) Use the graph paper provided to answer this part of the question..

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

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

[3 marks]

[3 markah]

1 (e)(ii)

3

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

Berdasarkan graf di 1(e)(ii), nyatakan hubungan di antara kawasan tangkapan dan populasi siput babi.

Terangkan perhubungan tersebut.

.....

.....

.....

[3 marks]

[3 markah]

1 (f)

3

(g) This experiment is repeated at the vegetable farm but the garden snails were captured immediately after raining. Predict the population size of garden snail.
Explain your prediction.

Experimen ini diulangi di kebun sayur tetapi siput babi ditangkap serta-merta selepas hujan. Ramalkan populasi siput babi.

Terangkan ramalan anda.

.....

.....

.....

[3 marks]

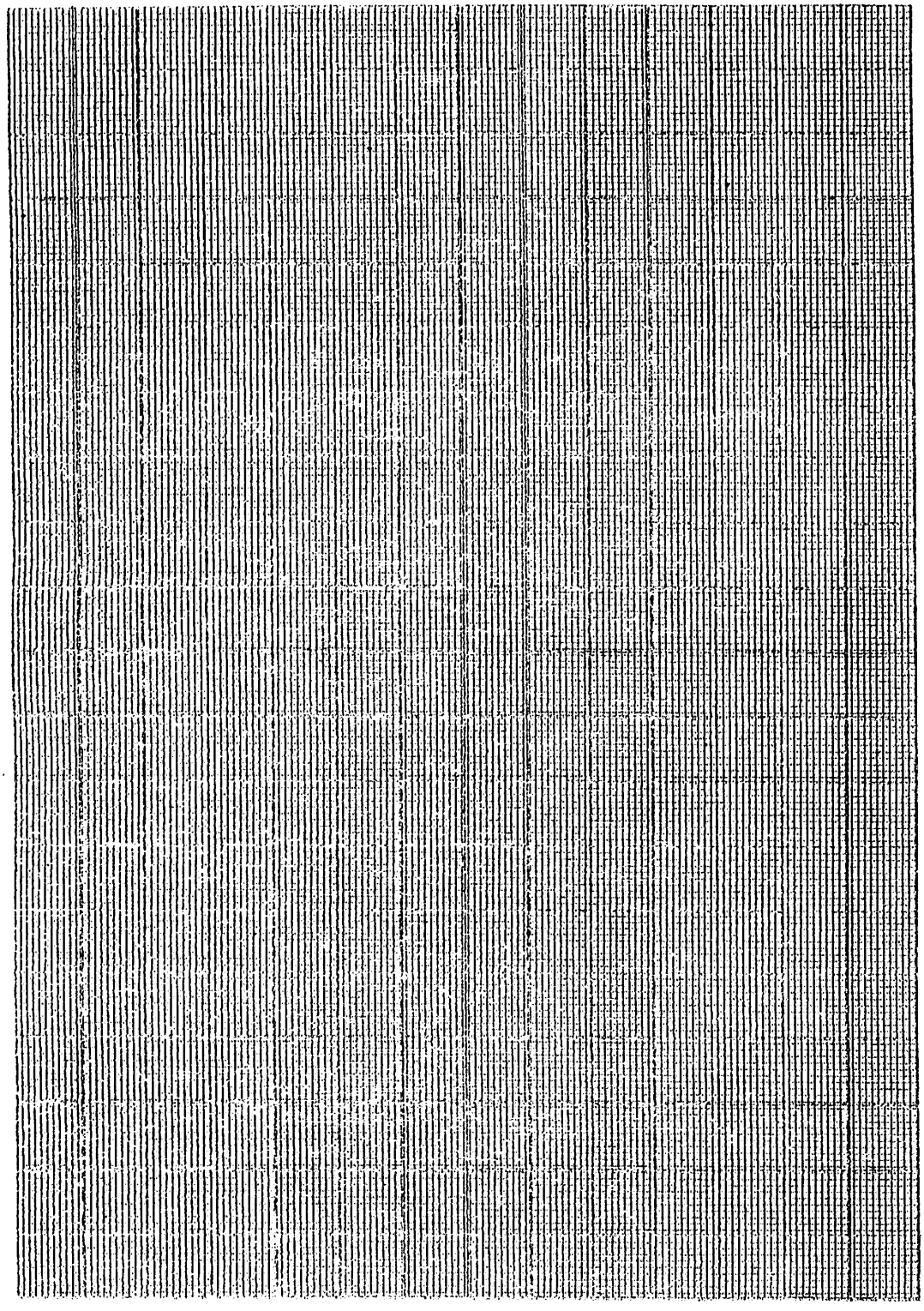
[3 markah]

1 (g)

3

Population size of garden snail against the catchment area

Saiz populasi siput babi melawan kawasan tangkapan



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

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

.....

.....

.....

[3 marks]

[3 *markah*]

1(h)

3

(i) Population of an organism is affected by biotic and abiotic factors. The following is a list of biotic and abiotic factors.

Populasi organism dipengaruhi oleh factor biosis dan abiosis.Berikut adalah senarai biosis dan abiosis.

pH, humidity, , temperature, topography, soil texture, decomposer, light intensity,
pH, Kelembapan, suhu, topografi, Tekstur tanah, pengurai, keamatan cahaya

Classify these factors in Table 3.

Kelaskan factor-faktor tersebut dalam jadual 3

Biotic factor *Faktor biosis*	Abiotic factors *Faktor abiosis*

Table 3
Jadual 3

[3 *marks*]

[3 *markah*]

1(i)

3

TOTAL

4551/3

2 Respiration in microorganisms produces energy and carbon dioxide. The quantity of energy produced is influenced by the presence of oxygen.The energy is released in the form of heat.

Based on the above information, plan a laboratory experiment to study the production of heat by a named microorganism in two conditions, aerobe and anaerobe.

The planning of your experiment must include the following aspects:

Respirasi mikroorganisma membebaskan tenaga dan karbon dioksida . Kuantiti haba yang dihasilkan dipengaruhi oleh kehadiran atau tiada oksigen. Tenaga tersebut dibebaskan dalam bentuk haba.

Berdasarkan kepada maklumat di atas, rancang satu eksperimen dalam makmal untuk mengkaji penghasilan haba oleh mikroorganisma yang dinamakan dalam dua keadaan , aerobik dan anaerobik.

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
- Experimental procedure or method
  Prosedur eksperimen
- Presentation of data
  Persembahan data

[17 marks]
[*17 markah*]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

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

2. Answer **all** questions.Write your answer for **Question 1** in the spaces provided in the question paper.
   *Jawab **semua** soalan.Jawapan anda bagi **Soalan 1** hendaklah ditulis pada ruangan yang disediakan dalam kertas soalan ini.*

3. Write your answers for **Question 2** on the answer sheet. You may use equations, diagrams, tables, graphs and other suitable methods to explain your answer.
   *Jawapan anda bagi **Soalan 2** hendaklah ditulis dalam helaian tambahan yang dibekalkan. Anda boleh menggunakan persamaan, rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda.*

4. Show your working, it may help you to get marks.
   Tunjukkan kerja mengira, ini membantu anda mendapatkan markah.

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

6. The marks allocated for each question or sub-part question are shown in brackets.
   Markah yang diperuntukkan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan.

7. If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.
   Jika anda hendak menukar jawapan, batalkan jawapan yang telah dibuat. Kemudian tulis jawapan yang baru.

8. The time suggested to completed **Question 1** is 45 minutes and **Question 2** is 45 minutes.
   *Anda dinasihatkan supaya mengambil masa 45 minit untuk menjawab **Soalan 1** dan 45 minit untuk **Soalan 2***

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

10. Hand in this question paper at the end of examination.
    Serahkan soalan dan jawapan di akhir peperiksaan.

4551/1(PP)
Biology
Kertas 1
Sept 2011
Peraturan
Pemarkahan

MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA
CAWANGAN NEGERI PAHANG

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2011

BIOLOGY

Kertas 1

PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

Peraturan pemarkahan ini mengandungi 2 halaman bercetak

[Lihat halaman sebelah]

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

END OF MARKING SCHEME
PERATURAN PEMARKAHAN TAMAT

4551/2(PP)
Biology
Kertas 2
Sept 2011
Peraturan
Pemarkahan

MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA
CAWANGAN NEGERI PAHANG

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2011

BIOLOGY

Kertas 2

PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

Peraturan Pemarkahan ini mengandungi 14 halaman bercetak

BIOLOGY PAPER 2

MARKING SCHEME

SECTION A [60 MARKS]

Question			Marking Criteria	Marks
1	(a)	(i)	Able to label S and T. **Sample answers:** S: Chloroplast T: Vacuole	 1 1 [2 m]
		(ii)	Able to state the function of S and cell wall. **Sample answers:** S: Absorb light energy Cell wall: Maintain the shape of plant cell // provides mechanical strength and support to plant cell // protect plant cell from rupturing	 1 1 [2 m]
	(b)		Able to explain structure T and how it is involved to maintain the turgidity of plant cell. **Sample answers:** P1 T is made up of tonoplast // has cell sap P2 To maintain the osmotic concentration / pressure of the cell sap P3 If the cell is flaccid / cell sap has high osmotic concentration / pressure, more water diffuses into cell by osmosis P4 If the cell has excess water / cell sap has low osmotic concentration / pressure	 1 1 1 1 [4 m]
	(c)		Able to describe the adaptations of leaf to carry out photosynthesis **Sample answers:** F1 Palisade mesophyll cells are closely / tightly packed P1 To absorb maximum light F2 Stomata are more abundant on the lower epidermis P2 To prevent water loss to surrounding // to allow exchange of gases between the leaf and its surrounding.	 1 1 1 1 [4 m]
			TOTAL	12

2	(a)		Able to state the structures of protein for K, L, M and N **Sample answers** Primary structure – K Secondary structure – L Tertiary structure – M Quarternery structure – N Note: 3 – 4 correct = 2 m 1 – 2 correct = 1 m	[2 m]
	(b)	(i)	Able to P, Q and R **Sample answers** P Phosphate group Q Pentose sugar R Nitrogenous base	1 1 1 [3 m]
		(ii)	Able to state two correct examples of secondary protein structure **Sample answers** Hair protein // Keratin Silk	1 1 [2 m]
	(c)	(i)	Able to explain the observation on Diagram 2.2 **Sample answers** P1 Part X of the apple remains the same but part Y turns brown / black P2 Alkali (medium) is not suitable for the enzyme P3 Neutral medium is suitable for the enzyme P4 Enzyme is denatured by the alkali // Alkali neutralizes / change the charges on the active sites of the enzyme // The enzyme cannot catalyse / start the chemical reaction / oxidation process / no oxidation in part X [Any 3]	1 1 1 1 [3 m]
		(ii)	Able to explain a treatment to prevent sliced apples from turning brown **Sample answers** F1 Soak apple in warm water / hot water P1 Enzymes are denatured / destroyed by heat P2 No chemical reaction / oxidation take place [Any 2]	1 1 1 [2 m]

			OR F2 Soak in hydrochloric acid / pineapple juice P3 Enzymes are denatured / destroyed by low pH / acidic medium P4 No chemical reaction / oxidation takes place [Any 2] OR F3 Coat the sliced apple in sugar / oil P5 Enzymes are not exposed to air / oxygen P6 No chemical reaction / oxidation takes place [Any 2]	1 1 1 [2m] 1 1 1 [2 m]
			TOTAL	12
3	(a)	(i)	Able to name the type of cell division in Diagram 3 **Sample answers** Mitosis / mitotic cell division	[1 m]
		(ii)	Able to state a reason why Diagram 3 is mitosis **Sample answers** P1 Only 2 daughter cells are formed / produced // Chromosome numbers in daughter cells are same as parents // Has 4 phases: prophase, metaphase, anaphase and telophase P2 Occurs at root tip [Any 1]	1 1 [1 m]
		(iii)	Able to arrange the phases in correct order **Sample answers** Q à R à S à T	[1 m]
	(b)		Able to describe why root tip is used for prepairing slides to show cell division occurred there. **Sample answers** F: Root tip is growing region / root tip has meristem tissue P: the cells are actively dividing my mitosis.	1 1 [2 m]

	(c)	(i)	Able to draw the chromosomes behavior in stages S and E **Sample answers** Refer to candidates' answer, based on the following criteria: D: chromosomes are in prophase II  E : 3 chromosomes are line up on spindle fibre 	1 1 [2 m]
		(ii)	Able to state the differences between process U and V **Sample answers** P1 Number of chromosomes of daughter cells is halved in U compared to process V which has 4 P2 Crossing over occurred in process U but not in process V P3 Daughter cells are variant in process U but in V, the daughter cells are genetically identical [Any 2]	1 1 1 [2 m]
	(d)		Able to explain how cancerous cells are formed in human body and its prevention **Sample answers** F1 Because of chemical substances / carcinogenic substances / rays P1 It will cause cells to undergoes uncontrolled cell division P2 Avoid from being exposed to mutagens // use sunblock to prevent from UV rays // not taking in food contains preservatives / colouring // taking organic food // radiotherapy // chemotherapy // immunotherapy // surgery	1 1 1 [3 m]
			TOTAL	12

4	(a)	(i)	Able to construct a food chain that consists of three trophic levels. **Sample answers** 1. *Hydrilla* sp. à Prawn à Fish // 2. *Hydrilla* sp. à Fish à Bird // 3. *Hydrilla* sp. à Small fish à Big fish Note: 1. 1 mark for correct organism in sequence with *Hydrilla* sp. 2. 1 mark for correct arrows	 1 1 [2 m]
		(ii)	Able to choose one abiotic factor and explain its effect to biotic factor **Sample answers** F1 Sufficient light intensity is absorbed by Hydrilla to undergoes photosynthesis P1 So fish / prawn is provided with enough oxygen for their survival F2 (Optimum) temperature not more than 45°C P2 Provide more stable habitat F3 pH value is neutral / not acidic/ not alkaline P3 Aquatic organisms are sensitive to the effects of the pH of water // if the changes in pH are considerable, they may be killed F4 Other abiotic factor P4 Any relevant explanation [Any 1F + 1P]	 1 1 1 1 1 1 1 1 [2 m]
	(b)	(i)	Able to state how the energy is lost to surroundings **Sample answers** As heat during respiration // Being used during growth / cell division / reproduction	 [1 m]

		(ii)	Able to calculate the total energy received by the goat Able to state the figure with correct unit **Sample answers** Energy receive = $\frac{1}{100} \times 3100$ kJ = 310 kJ Note: Marks are awarded for calculation and answer with unit	1 1 [2 m]
		(iii)	Able to state the percentage of energy used by the goat to grow **Sample answers** $\frac{300}{310} \times 100\%$ = 96.8%	 [1 m]
	(c)	(i)	Able to state kingdom A and its role in our digestive system **Sample answers** F1 Monera P1 To synthesis vitamin B12 and vitamin K	 1 1 [2 m]
		(ii)	Able to explain how cholera spread and its symptoms **Sample answers** F1 Spread when someone drinking water / eating food contaminated with cholera bacterium P2 Symptoms: diarrhoea / vomiting / leg cramps / rapid loss of body fluid / dehydration	 1 1 [2 m]
			TOTAL	12
5	(a)		Able to state types of variation shown in Diagram 5.1 (i) and (ii) **Sample answers** Diagram 5.1 Continuous (variation) Diagram 5.2 Discontinuous (variation)	 1 1 [2 m]
	(b)		Able to state other examples of continuous and discontinuous variation **Sample answers** (i) Height / Body weight (ii) Blood group / Type of hair / Ability to roll tongue / Thumbprint / any relevant examples	 1 1 [2 m]

[Lihat halaman sebelah]

<table>
<tr>
<td></td><td>(c)</td><td></td>
<td>Able to state two differences for the continuous and discontinuos variation

Sample answers

<table>
<tr><th>Aspect</th><th>Continuous</th><th>Discontinuous</th></tr>
<tr><td>Intermediate characteristics</td><td>With intermediate characteristics</td><td>Distinctive characteristics</td></tr>
<tr><td>Quantitative or qualitative</td><td>The characters are quantitative</td><td>The characters are qualitative</td></tr>
<tr><td>Environmental factors</td><td>Is influenced by environmental factors</td><td>Is not influenced by environmental factors</td></tr>
<tr><td>Genes</td><td>Two or more genes control the same characters</td><td>A single gene determines the differences in the traits of a character.</td></tr>
<tr><td>Phenotype</td><td>The phenotype is usually controlled by many pairs of alleles</td><td>The phenotype is controlled by a pair of alleles</td></tr>
</table>
[Any 2 pairs]</td>
<td>1

1

1

1

1

[2 m]</td>
</tr>
<tr>
<td></td><td>(d)</td><td></td>
<td>Able to state and explain the genetic factor based on Diagram 5.2

Sample answers
F Independent assortment
P Produces various genetic combination of gametes</td>
<td>1
1
[2 m]</td>
</tr>
<tr>
<td></td><td>(e)</td><td>(i)</td>
<td>Able to state the mutation involved in process M

Sample answers
F Base substitution
P Is the replacement of one / more base / nucleotide with another</td>
<td>1
1

[2 m]</td>
</tr>
<tr>
<td></td><td></td><td>(ii)</td>
<td>Able to state and explain the disease

Sample answers
F Sickle-cell anemia
P1 Mutated (recessive) allele causes the production of abnormal haemoglobin which crystallizes
P2 Causing the red blood cells to become sickle shaped / S-shaped
[F + any 1P]</td>
<td>1
1

1
[2 m]</td>
</tr>
<tr>
<td></td><td></td><td></td><td>TOTAL</td><td>12</td>
</tr>
</table>

SECTION B [40 MARKS]

Question			Marking Criteria	Marks
6	(a)		Able to describe the plasma membrane as a selective permeable membrane **Sample answers** F Selective permeable means that certain substances can move across the plasma membrane freely while others cannot P1 Plasma membrane is composed of phospholipids bilayer and protein P2 Phospholipids has polar head which is hydrophilic and non polar tail which is hydrophobic P3 Allows lipid-soluble molecules / fatty acids and glycerol //non-polar molecules / oxygen / carbon dioxide //water can pass through the <u>phospholipids</u> freely P4 Large water-soluble molecules / glucose /amino acids can pass through the plasma membrane by aided of <u>carrier protein</u> P5 <u>Pore protein</u> allow small water-soluble molecules / ions to pass through the plasma membrane	1 1 1 1 1 [6 m]
	(b)	(i)	Able to explain natural preservation which can preserve the foods for a long period of time. **Sample answers** P1 Immersed in salt and sugar solutions P2 Solution outside of the food is hypertonic compared to the cytoplasm P3 Water in the food diffuse out by osmosis P4 The cells in the food become dehydrated P5 Microorganism / bacteria/fungi lose water P6 These conditions are not favorable for the growth of microorganism	1 1 1 1 1 1 [6 m]
		(ii)	Able to explain what happened to the plant in diagrams 6 (a) and 6 (b) **Sample answers** Diagrams 6 (a) P1 The soil solution is hypotonic to the cell sap of the plants cell P2 Water diffuses into the cell by osmosis	1 1

[Lihat halaman sebelah]

			P3 Vacuole expand / swell up // cytoplasm to press outwards against the cell wall P4 Cell become turgid, supporting the plant upright Diagrams 6 (b) P1 The soil solution becomes hypotonic to the cell sap of the plants cell P2 Water diffuses out from the cell by osmosis P3 Vacuole / cytoplasm shrink // plasma membrane pull away from the cell wall P4 The plasmolysed / flaccid cells causing the plant to wilt	1 1 1 1 1 [8 m]
			TOTAL	20
7	(a)		Able to state adaptations of respiratory structures : **Sample answers** F1 A large number P1 Large total surface area per volume for gaseous exchange F2 Moist P2 Respiratory gaseous dissolve easily F3 Very thin // one cell thick P3 Quick and easy gases diffusion F4 Network of blood capillaries P4 To increase the rate of gases transportation [Any 3 F + correspond P]	 1 1 1 [3 m]
	(b)		Able to explain the regulatory mechanism of carbon dioxide in human body **Sample answers** P1 During vigorous exercise, the partial pressure of carbon dioxide increases // rate of cellular respiration increases P2 Thus, carbon dioxide reacts with water to form carbonic acids P3 (Due to high level of CO_2 in blood), its results in a drop in the pH value of the blood (and) / cerebrospinal fluid P4 The drop in pH id detected by (central) chemoreceptors (in the medulla oblongata P5 Send the nerve impulse to the respiratory centre / (which is in turn sends nerve impulse to) diaphragm and intercostal muscles P6 Respiratory muscles to contract and relax faster P7 Breathing and ventilation rates is increases P8 Excess CO_2 is eliminated from the body	 1 1 1 1 1 1 1 1

			P9 CO_2 concentration / pH value of the blood return to normal levels. [any 7P]	1 [7 m]
	(c)		Able to explain the effect of human respiratory response and rate of respiration in different situations **Sample answers** F1 At rest, the respiratory rate is normal / 12 – 20 breaths per minute P1 The partial pressures of O_2 and CO_2 are normal F2 When a person is in fear, breathing rate increase P2 It's needed because the demand of a higher respiration rate in cells P3 In order to oxidize more glucose P4 To produce more energy P5 (Then), rapid muscles contraction (as a response to the dangerous situation / running) [F2 + any 3 P] F3 (In mountain climbing), as the altitude increases, the atmospheric pressure decreases P6 Thus, partial pressure of O_2 becomes lower P7 Causes a drop in the oxygen level of blood P8 (The person will face) difficulty in breathing P9 So, the person will experience headache / nausea / dizziness [F3 + any 3 P]	 1 1 (2 m) 1 1 1 1 1 (4 m) 1 1 1 1 1 (4 m) [10 m]
			TOTAL	20
8	(a)		Able to explain the developing foetus is nourished and protected in the mother's uterus. **Sample answers** N1 Nutrients / oxygen / antibodies / hormones / (any 2 examples) N2 From maternal are transported to the foetus through umbilical vein N3 Carbon dioxide and nitrogenous waste products from the foetus are transported to the maternal (vein) through umbilical arteries N4 The numerous blood capillaries (in the chorionic villi) provide a large surface area for diffusion of materials	 1 1 1 1

			P1 The foetal circulatory system and the maternal circulatory system are separated P2 Prevents certain harmful bacteria and their toxins from entering the foetus P3 Prevents the action of maternal hormones / chemicals in mother's blood that could harm the developing foetus P4 Prevents the mixing of blood groups of mother and the foetus P5 Which cause Agglutination P6 Prevents the fine blood vessels of the foetus do not burst P7 Due to high blood pressure of the maternal circulation [4 N + any 6 P]	1 1 1 1 1 1 1 [10 m]
	(b)		Able to state and explain the technique of reproductive technology **Sample answers** F The couple can use the in-vitro fertilization (IVF) method P1 Mother undergoes hormonal treatment to produce more secondary oocyte P2 A fine laporoscope is used to remove the secondary oocyte from her ovary P3 The secondary oocyte are placed in a Petri dish of culture solution P4 Then, sperms from the husband are added to secondary oocyte P5 The sperm and ova fused and become zygote //fertilization is occurred to form zygote P6 The zygote undergoes mitosis to become embryo / eight-cell stage P7 The embryo formed is implanted in the wife's uterus P8 A baby born is called as a test-tube baby [F + any 7 P] Able to explain the moral issues related to the suggested technique of reproductive technology **Sample answers** M1 Freezing and destroying living embryos M2 Vitro fertilization morally acceptable	 1 1 1 1 1 1 1 1 (8 m) 1 1 (2 m) [10 m]
			TOTAL	20

9	(a)	(i)	Able to explain why his mother is not a compatible donor to Maria **Sample answers** P1 Maria who is blood group is B has antigen B on the surface of red blood cells P2 And antibody A in her blood serum P3 Mother who is blood group is AB has antigen A and antigen B P4 If the two blood is mixed together, agglutination will occur /clumping together of red blood cells.	1 1 1 1 [4 m]
		(ii)	Able to explain the meaning of codominance **Sample answers** Two different alleles for a genetic trait are both expressed in the phenotype of heterozygous Able to explain why their child's blood group is O **Sample answers** F These blood groups is determined by 3 alleles / I^A, I^B, I^O P1 The husband is heterozygous / I^AI^O while his wife is heterozygous / I^BI^O P2 He will produce sperms / male gametes with I^A <u>or</u> sperms / male gametes with I^O and she will produce ovum / female gametes with I^B <u>or</u> ovum / female gametes with I^O P3 Meiosis is occurred to produce (haploid) gametes P4 Diploid zygote is produced by fertilization P5 Possible genetic combinations / genotypes in offspring are I^AI^O or I^BI^O, I^AI^B and I^OI^O P6 Their son's blood group is O because the genotype is I^OI^O	1 1 1 1 1 1 1 1 [8 m]

	(b)		Able to describe how the process of DNA fingerprinting **Sample answers** P1 The process begins with a blood or cell sample from which the DNA is extracted. P2 The DNA is cut into fragments using a restriction enzyme P3 The DNA band pattern is transferred to a nylon membrane P4 A radioactive DNA probe is introduced. P5 The DNA probe binds to specific DNA sequences on the nylon membrane P6 The excess probe material is washed away leaving the unique DNA band pattern P7 The radioactive DNA pattern is transferred to X-ray film by direct exposure. P8 When developed, the resultant visible pattern is the DNA fingerprinting [Any 6 P] Able to evaluate the disadvantages of genetic engineering towards mankind **Sample answers** P1 Misused of knowledge to create new combination of genes which may be harmful P2 Could alter the natural evolution process P3 Mutation P4 Any acceptable answers [Any 2 P]	1 1 1 1 1 1 1 1 (6 m) 1 1 1 1 (2 m) [8 m]
			TOTAL	20

END OF MERKING SCHEME
PERATURAN PEMARKAHAN TAMAT

4551/3(PP)
Biology
Kertas 3
Sept 2011
Peraturan
Pemarkahan

MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA
CAWANGAN NEGERI PAHANG

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2011

BIOLOGY

Kertas 3

PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

Peraturan pemarkahan ini mengandungi 15 halaman bercetak

QUESTION 1

1 (a) KB0603 – Measuring Using Numbers

<table>
<tr><th>Marking Criteria</th><th>Score</th></tr>
<tr><td>Able to record all 4 readings for the number of garden snail in the second captured and the number of garden snail marked in the second capture

Sample Answer:

<table>
<tr><th>Area for garden snail captured</th><th>Number of garden snail marked in the second capture / unit</th><th>Number of garden snail marked in the second capture / unit</th></tr>
<tr><td>Vegetable farm</td><td>14</td><td>5</td></tr>
<tr><td>School field</td><td>13</td><td>9</td></tr>
</table>
</td><td>3</td></tr>
<tr><td>Able to list 3 readings correctly</td><td>2</td></tr>
<tr><td>Able to list 2 readings correctly</td><td>1</td></tr>
<tr><td>Able to list 1 reading correctly
OR
No response or incorrect response</td><td>0</td></tr>
</table>

1 (b) (i) [KB0601 – Observation]

Marking Criteria	Score
Able to state **two** different observations based on the following criteria : [Observation must have values / type for MV and RV from Table 1 or comparison between two readings.] Manipulated Variable: Area for garden snail capture Responding Variable: Number of garden snail in second captured / Number of garden snail in second captured Sample answer: 1. If the snail caught from vegetable farm, the number of garden snail marked in the second captured is 5 unit 2. If the snail caught from school field, the number of garden snail marked in the second captured is 9 unit 3. The number of garden snail in the second captured is 14 unit, from vegetable farm 4. The number of garden snail in the second captured is 13 unit, from school field	3
Able to state one observation correctly and one-two inaccurate observations. Sample answers: 1. If the snail caught from vegetable farm, the number of garden snail marked in the second captured higher // inversely. 2. The number of snail captured in the second capture influenced by the area for garden snail captured /catchment area	2
Able to state only one correct observation OR Able to state two different observations at idea level. Sample answers: 1. The number of snail captured in the second capture // marked in second captured is different 2. The number of snail captured in the second capture // marked in second captured is increasing / decreasing	1
No response or incorrect response	0

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

<table>
<tr><th>Marking Criteria</th><th>Score</th></tr>
<tr><td>Able to make two inferences correctly

Note: Inference must match observation
P1: Food source from catchment area
P2: Population size of garden snail

Sample answers:

1. More food source at vegetable farm, more population size of garden snail
2. Less food source at school field, less population size of garden snail</td><td>3</td></tr>
<tr><td>Able to make one correct inference and one-two inaccurate inference inaccurately

Sample answers:

1. More food source at vegetable farm / more population of garden snail at vegetable farm
2. Less food source at school field / less population of garden snail at school field</td><td>2</td></tr>
<tr><td>Able to state one correct inference and 1 – 2 inference at idea level

Sample answers:

1. Population of garden snail depends on catchment area
2. Different population of garden snail</td><td>1</td></tr>
<tr><td>No response or incorrect response</td><td>0</td></tr>
<tr><td>Scoring: Observation and inference

<table>
<tr><th>Score</th><th>Correct</th><th>Inaccurate</th><th>Idea</th><th>Wrong</th></tr>
<tr><td>3</td><td>2</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td rowspan="2">2</td><td>1</td><td>1</td><td>-</td><td>-</td></tr>
<tr><td>-</td><td>2</td><td>-</td><td>-</td></tr>
<tr><td rowspan="4">1</td><td>1</td><td>-</td><td>1</td><td>-</td></tr>
<tr><td>-</td><td>-</td><td>2</td><td>-</td></tr>
<tr><td>-</td><td>1</td><td>1</td><td>-</td></tr>
<tr><td>1</td><td>-</td><td>-</td><td>1</td></tr>
<tr><td rowspan="2">0</td><td>-</td><td>1</td><td>-</td><td>1</td></tr>
<tr><td>-</td><td>-</td><td>1</td><td>1</td></tr>
</table>
</td><td></td></tr>
</table>

1 (c) [KB0610 – Controlling Variables]

<table>
<tr><th>Marking Criteria</th><th>Score</th></tr>
<tr><td>Able to state all 3 variables and the methods to handle the variable correctly.

Sample Answer :

<table>
<tr><th>Variables</th><th>Method to handle the variable correctly</th></tr>
<tr><td><u>Manipulated variable</u>:

Capture area for garden snail // catchment area</td><td>Used different area to catch garden snail // Catch garden snail from different places // Catch garden snail from vegetable farm AND school field</td></tr>
<tr><td><u>Responding variable</u> :

Number of garden snail in second captured //

Number of marked garden snail in second captured // Population (size) of garden snail</td><td>Count and record the number of garden snail in second captured //number of marked garden snail in second captured

Calculate population of garden snail using formula
$\text{Population size} = \frac{\text{Number of garden snail in the first capture} \times \text{Number of garden snail in the second capture}}{\text{Number of marked garden snail in the second capture}}$</td></tr>
<tr><td><u>Constant variable</u>:

Number of garden snail in the first captured

Type of garden snail

Day for recaptured</td><td>

Same number of garden snail catch in the first captured is 15.

Catch the same type of garden snail

The garden snail is recaptured after three days released</td></tr>
</table>
6 ticks</td><td>3</td></tr>
<tr><td>4 – 5 ticks</td><td>2</td></tr>
<tr><td>2 – 3 ticks</td><td>1</td></tr>
<tr><td>0 – 1 tick</td><td>0</td></tr>
</table>

1 (d) [KB0611 – Making Hypothesis]

Marking Criteria	Score
Able to state hypothesis following all criteria P1 Manipulated variable (Catchment area) P2 Responding variable (Number of garden snail) H Relationship Sample answers: 1. The number of garden snail / marked in the second captured from vegetable farm is higher than from school field / vice versa. 2. The population size of garden snail in vegetable farm is higher than school field / vice versa.	3
Able to make a hypothesis relating the manipulated variable and the responding variable inaccurately Sample answers: 1. The number of garden snail / marked in the second captured from vegetable farm is higher. 2. Number of garden snails / marked in the second capture depends on the catchment area. [No H] 3. Decrease the number snails marked in second capture , increase population of garden snails. [No P1]	2
Able to make a hypothesis at idea level Sample answers: 1. Area affects / influence garden snails. [No P1 and H] 2. Different area cause different garden snails. [No P2 and H]	1
No response or incorrect response H is not given if there is no P1 or P2	0

1 (e) (i) [KB0606 – Communication]

<table>
<tr><th>Marking Criteria</th><th>Score</th></tr>
<tr><td>Able to construct a table correctly based on the following aspects:

T The 5 titles with units correctly.
D All the data – Number of garden snail in first , second and mark in the second captured
C Population of the garden snail

Sample answers :

<table>
<tr><th>Catchment area of the garden snail</th><th>Vegetable farm</th><th>School field</th></tr>
<tr><td>Number of garden snails in the first captured / unit</td><td>15</td><td>15</td></tr>
<tr><td>Number of garden snails in the second captured / unit</td><td>14</td><td>12</td></tr>
<tr><td>Number of marked garden snails in the second capture / unit</td><td>5</td><td>8</td></tr>
<tr><td>Population size of garden snail / unit</td><td>42</td><td>20</td></tr>
</table>
</td><td>3</td></tr>
<tr><td>Any two correct</td><td>2</td></tr>
<tr><td>Any one correct</td><td>1</td></tr>
<tr><td>No response or incorrect response</td><td>0</td></tr>
</table>

1 (e) (ii) [KB0612 – Relationship between space and time]

Marking Criteria	Score
Able to draw the bar chat correctly with the following criteria: P (paksi) Uniform scales on both axis, label bar T (titik) All 2 points transferred correctly B (bentuk) Same size for the bars and bars are separated	3
Any two criteria correct.	2
Any one criteria correct	1
No response or incorrect response	0

1 (f) [KB0608 – Interpreting Data]

Marking Criteria	Score
Able to explain the relationship between the catchment area and population size of garden snails based on the bar chart and the following aspects: R Able to state the relationship (Population size & area) E1 Amount of food sources E2 Humidity Sample answers: 1. The population size of garden snail at vegetable farm increase / higher than population size of garden snails at school field because more amount of food sources and more / high humidity / wet area. 2. The population size of garden snail at school field decreases / less than population size of garden snails at vegetable farm because less amount of food sources and less / decrease humidity / dry area.	3
Able to interpret the relationship incompletely [R + 1E] Sample answers: 1. The population of garden snail at vegetable farm increase / higher than population of garden snails at school field because more amount of food sources / more / high humidity / wet area. 2. The population of garden snail at school field decreases / less than population of garden snails at vegetable farm because less amount of food sources / less / decrease humidity / dry area. **Note:** Relationship at idea level is not accepted eg: The population of garden snail is influenced by the catchment area BUT explanation can be accepted.	2
Able to interpret the relationship at idea level [R only] Sample answer: The population of garden snail at vegetable farm increase / higher than population of garden snails at school field	1
No response or incorrect response or wrong relationship	0

1 (g) [KB0605 – Predicting]

Marking Criteria	Score
Able to predict and explain the outcome of the experiment correctly with the following aspects: P Correct Prediction – Population size of garden snails increase / any suitable value more than before E2 Increase humidity E3 More food sources Sample answer: The population size of garden snails will increase because more / increase of humidity and more food sources in vegetable farm. [P + 2E]	3
P + Any 1 E	2
P only	1
No response or incorrect response	0

1 (h) [KB0609 –Defining by Operation]

Marking Criteria	Score
Able to define operationally the population size of garden snail based on the result of this experiment P1 Estimating the population size of garden snail in vegetable farm and school field P2 Number of garden snails marked in second captured P3 The population of garden snails depends on the catchment area // hypothesis statement Sample answers: Population size of garden snails is estimating population size of garden snails in vegetable farm and school field, the number of garden snails marked in second captured depends on the catchment area, population size of garden snail in vegetable farm higher than population in school field.	3
Any two correct	2
Any one correct	1
No response or incorrect response // Theorytical explanation	0

1(i) [KB0602 – Classifying]

<table>
<tr><th>Marking Criteria</th><th>Score</th></tr>
<tr><td>Able to classify all factors into two groups correctly:

<table><tr><th>Biotic factor</th><th>Abiotic factor</th></tr><tr><td>Decomposer</td><td>pH
Humidity
Temperature
Topography
Soil Texture
Light intensity</td></tr></table>7 ticks</td><td>3</td></tr>
<tr><td>6 ticks</td><td>2</td></tr>
<tr><td>5 ticks</td><td>1</td></tr>
<tr><td>0 – 4 tick</td><td>0</td></tr>
</table>

QUESTION 2

PROBLEM STATEMENT [KB061201]

Marking Criteria	Score
Able to state a problem statement relating the manipulated variable (MV) with the responding variable (RV) correctly P1 MV (presence of oxygen) P2 RV (Quantity of heat released // Rise in temperature) H Question form and have question mark Sample Answer: 1. Why in the presence of oxygen the temperature rises but absence of oxygen the temperature does not rise? 2. Why the rise in temperature / quantity of heat produced during aerobe respiration / presence of oxygen is different from during anaerobe respiration / absence of oxygen? 3. Is the presence of oxygen influences the rise in temperature // production of heat compare to absence of oxygen by the yeast?	3
Able to state a problem statement inaccurately Sample answer: 1. Rise in temperature // quantity of heat produced is influenced by the presence or absence of oxygen by the yeast 2. Does the yeast causes the temperature to rise // production of heat? 3. Is the presence or absence of oxygen influences the activity of yeast?	2
Able to state a problem statement inaccurately Sample answer The rise in temperature // quantity of heat produced is influenced by oxygen In the presence of oxygen, yeast carry out anaerobe respiration	1
No response or wrong response *REJECT ONLY H*	0

HYPOTHESIS [KB061202]

Marking Criteria	Score
Able to state a hypothesis relating the manipulated variable to the responding variable correctly P1 MV- presence of oxygen P2 RV – rise / changes in temperature H Relationship Sample answer: 1. Rise in temperature / Quantity of heat produced by yeast / microorganism is higher in the presence of oxygen / aerobe and lower in the absence of oxygen / anaerobe. 2. When oxygen is present the rise in temperature is higher and lower when oxygen is absent.	3
Able to state a hypothesis inaccurately Sample answer: 1. Rise in temperature / Quantity of heat produced by yeast activity is influenced by presence of oxygen and the absence of oxygen. 2. Rise in temperature / Quantity of heat produced by yeast activity is higher in the presence of oxygen activity of yeast. 3. When oxygen is present the activity of yeast is faster and lower when no oxygen.	2
Able to state a hypothesis at idea level Sample answer: 1. Aerobic respiration / anaerobic respiration produced energy 2. Temperature rises when there is oxygen // no oxygen	1
No response or incorrect response	0

VARIABLES [KB061203]

Marking Criteria	Score
Able to state all three variables correctly Sample answer: Manipulated: Presence of oxygen Responding: Rise / Changes in temperature // quantity of heat produced Fixed: Type of microorganism // volume / concentration of yeast // temperature // pH // volume / concentration of substrate	3
Able to state any two variables correctly	2
Able to state any one variables correctly	1
No response or incorrect response	0

LIST OF APPARATUS AND MATERIALS [KB061205]

Marking Criteria	Score
Able to list 6 apparatus and 4 materials Apparatus: Test tube / boiling tube, water bath // cotton wool, thermometer, stopper with hole, retort stand, stopwatch Materials: Yeast, glucose solution, boiled glucose solution, paraffin oil [6A + 4M]	3
Able to list 4 apparatus and 3 materials	2
Able to list 3 apparatus and 2 materials	1
No response or incorrect response	0

Apparatus: Test tube / boiling tube, water bath // cotton wool, thermometer, stopper with hole, retort stand, stopwatch

Materials: Yeast, glucose solution, boiled glucose solution, paraffin oil

PROCEDURE [KB061204]

Marking Criteria	Score
Able to describe all the 5K, where K1: Preparation of materials and apparatus (any 4) K2: Operating the constant variable (any 1) K3: Operating the responding variable (any 1) K4: Operating the manipulated variable (any 1) K5: Steps to increase reliability of results accurately / precaution (any 1)	3
3 – 4K	2
Any 2K	1
No response or incorrect response / 1K	0

Sample answer for procedure:

Step	Description	K's
1	Glucose solution is heated to remove dissolved oxygen and left to cool.	K1+K5
2	Two boiling tubes are labelled P and Q.	K1
3	Boiling tube P is filled with 5 ml of yeast suspension and 15 ml of boiled glucose solution.	K1+K2
4	Boiling tube Q is filled with 5 ml of yeast suspension and 15 ml of glucose solution.	K4+K2
5	A thin layer of paraffin oil is added to cover the contents of the boiling tube.	K5
6	A thermometer is inserted in the hole of a stopper.	K1
7	The stopper is plugged to the boiling tubes.	K1
8	Boiling tubes P and Q is placed in a water bath at the temperature 37°C // wrapped with cotton wool.	K5
9	The initial temperature of the content of both boiling tubes is recorded.	K1
10	After 30 minutes, the final temperature is recorded.	K3
11	Step 1 to 10 is repeated three times to get accurate / average reading.	K5
12	All data is recorded / tabulated in a table	K1

PRESENTATION OF DATA [KB061203]

<table>
<tr><th>Marking Criteria</th><th>Score</th></tr>
<tr><td>Able to present all the data with units correctly

M1 Content in boiling tube - Yeast + glucose
- Yeast + boiled glucose + paraffin
M2 Change in temperature + correct unit

Sample answer:

<table>
<tr><th>Content in test tube</th><th>Initial temperature (^{0}C)</th><th>Final temperature (^{0}C)</th><th>Change in temperature (^{0}C)</th></tr>
<tr><td>Yeast + glucose</td><td></td><td></td><td></td></tr>
<tr><td>Yeast + boiled glucose + paraffin oil</td><td></td><td></td><td></td></tr>
</table>
</td><td>2</td></tr>
<tr><td>Able to present a table with at least two tittles correctly

Sample answer:

<table>
<tr><th>Content in test tube</th><th>Change in temperature (^{0}C)</th></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
</table>
</td><td>1</td></tr>
<tr><td>No response or incorrect response or 1K only</td><td>0</td></tr>
</table>

END OF MARK SCHEME
PERATURAN PEMARKAHAN TAMAT

