

Biologi
Kertas 1
September
2008
1¼ jam

LOGO SEKOLAH

**SEKOLAH-SEKOLAH MENENGAH
NEGERI PAHANG**

PEPERIKSAAN PERCUBAAN SPM TAHUN 2008

Kertas 1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

- 1 *Kertas soalan ini adalah dalam dwibahasa, iaitu bahasa Inggeris dan bahasa Melayu. Versi bahasa Melayu ditulis dengan huruf condong dan diletakkan dalam kurungan.*
- 2 *Kertas soalan ini mengandungi 50 soalan yang terdiri daripada tiga bahagian, iaitu Bahagian A, Bahagian B dan Bahagian C. Jawab semua soalan dalam tiap-tiap bahagian.*
- 3 *Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan yang disediakan. Bagi setiap soalan hitamkan satu ruangan sahaja.*
- 4 *Rajah yang mengiringi soalan dimaksudkan untuk memberi maklumat yang berguna bagi menjawab soalan. Rajah tidak dilukis mengikut skala kecuali dinyatakan sebaliknya.*
- 5 *Penggunaan kalkulator saintifik yang tidak boleh diprogramkan adalah dibenarkan.*

Kertas soalan ini mengandungi 32halaman bercetak

1. Which of the following structures is found in both animal and plant cells?
(Manakah antara berikut struktur yang terdapat pada sel haiwan dan sel tumbuhan?)

- | | |
|--|------------------------------|
| A Plasma membrane
(Membrane plasma) | C Chloroplast
(Kloroplas) |
| B Cell wall
(Dinding sel) | D Cell sap
(Sap sel) |

2. Diagram 1 shows one specialised cell.
(Rajah 1 menunjukkan satu sel yang khusus.)

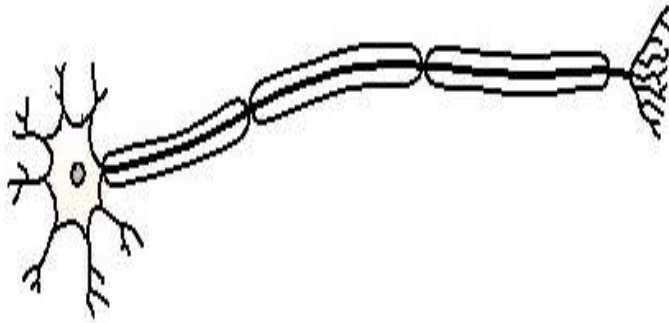


Diagram 1

What is the function of the cell in Diagram 1?
Apakah fungsi sel dalam Rajah 1?

- A. Produce energy during cellular respiration.
(Menghasilkan tenaga semasa respirasi sel)
- B. Brings impulse from spinal cord to the muscles
(Membawa impuls dari saraf tunjang ke otot)
- C. Produce electrical signal when stimuli detected
(Menghasilkan isyarat elektrik bila rangsangan dikesan)
- D. Change the electrical signal to the chemical signal
(Menukarkan isyarat elektrik kepada isyarat kimia)

3. Diagram 2 shows the structure of plasma membrane
(Rajah 2 menunjukkan struktur membran plasma)

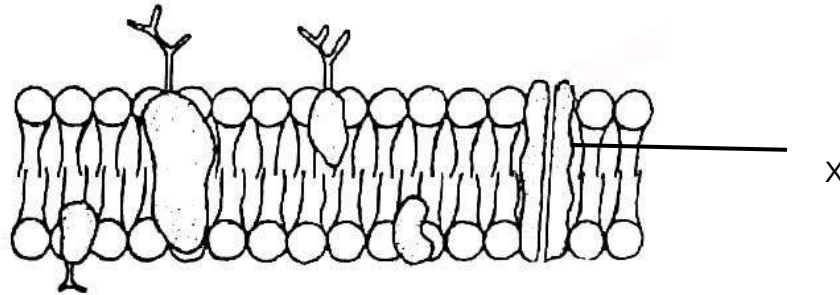


Diagram 2

What is the structure labelled X?
(Apakah struktur berlabel X ?)

- | | |
|-----------------------------------|-----------------------------------|
| A. Lipid
(Lipid) | B Tiny pore
(Liang seni) |
| C. Glycoprotein
(Glikoprotein) | D Pore protein
(Protein liang) |
4. Which of the following best describes a semi-permeable membrane?
(Yang manakah di antara berikut benar mengenai membran separa telap ?)
- A It allows only water molecules to pass through it
(Ia hanya membenarkan molekul air melaluinya)
 - B It allows water soluble molecules to pass through it
(Ia hanya membenarkan molekul yang telap air melaluinya)
 - C It allows only certain molecules to pass through it
(Ia hanya membenarkan molekul tertentu melaluinya)
 - D It allows only certain molecules to pass into the cell but not out of it
(Ia hanya membenarkan molekul tertentu masuk ke dalam sel tetapi tidak boleh keluar melaluinya).

5. Which of the following is the inorganic compound in the cell?
(Manakah antara berikut merupakan sebatian tak organik di dalam sel?)
- A. Proteins
(Protein)
- B. Lipids
(Lipid)
- C. Water
(Air)
- D. Nucleic acid
(Asid nukleik)
6. Which of the following elements is required by plants for the manufacturing amino acids?
(Manakah antara elemen berikut adalah diperlukan oleh tumbuhan bagi membina asid amino?)
- A Nitrogen
(Nitrogen)
- B Magnesium
(Magnesium)
- C Phosphorus
(Fosforus)
- D Manganese
(Manganese)
7. Diagram 3 shows the basic DNA structure
(Rajah 3 menunjukkan struktur asas DNA)

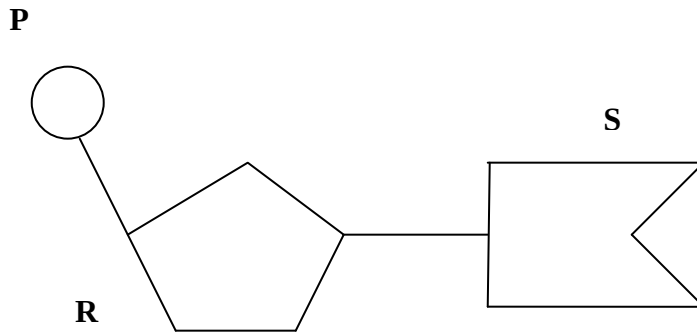


Diagram 3

What are P, R and S?
(Apakah P, R dan S?)

	P	R	S
A	Nucleotide (nukleotida)	Phosphate (fosfat)	Deoxyribose sugar (gula deoksiribosa)
B	Phosphate (fosfat)	Deoxyribose sugar (gula deoksiribosa)	Nitrogenous base (bes bernitrogen)
C	Phosphate (fosfat)	Nucleotide (nukleotida)	Nitrogenous base (bes bernitrogen)
D	Nitrogenous base (bes bernitrogen)	Phosphate (fosfat)	Nucleotide (nukleotida)

8. Diagram 4 shows a phase in cell division.
(Rajah 4 menunjukkan satu fasa pembahagian sel))

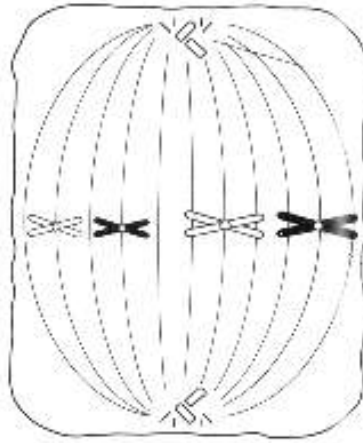


Diagram 4

Name the above stage.
(Namakan peringkat di atas.)

- | | |
|----------------------------|----------------------------|
| A. Prophase
(Profasa) | B. Anaphase
(Anafasa) |
| C. Metaphase
(Metafasa) | D. Telophase
(Telofasa) |
9. Vitamin K is essential for the
Vitamin K perlu untuk
- A formation of protrombin
(Pembentukan protrombin)
 - B release of thrombokinase
(Perembesan trombokinase)
 - C conversion of fibrinogen to fibrin
(Pertukaran dari fibrinogen kepada fibrin)
 - D conversion of prothrombin to the thrombin
(Pertukaran dari protrombin kepada trombin)

10. Diagram 5 shows part of a cow's digestion system
(*Rajah 5 menunjukkan sebahagian sistem pencernaan lembu*)

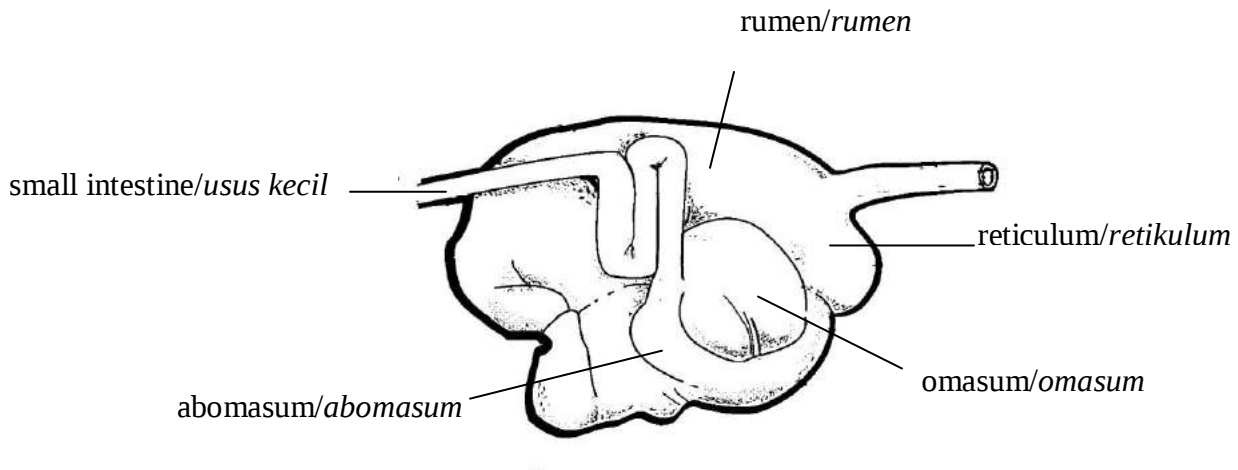


Diagram 5

Which one shows the correct sequence of food digestion in the cow's stomach?

Antara berikut yang manakah menunjukkan urutan yang betul untuk laluan makanan dalam proses pencernaan di perut lembu?

- A. Mouth → Rumen → Retikulum → Omasum →
Mouth → Abomasum → Small intestine
- B. Mouth → Rumen → Mouth →
Retikulum
Omasum → Abomasum → Small intestine
- C. Mouth → Retikulum → Rumen → Mouth →
Abomasum → Omasum → Small intestine
- D. Mouth/Mulut → Retikulum → Mouth/Mulut → Omasum →
Abomasum → Rumen → Small intestine/Usus kecil

13. The diagram 6 below shows the respiratory system of an insect
(Diagram 6 menunjukkan sistem respirasi serangga)

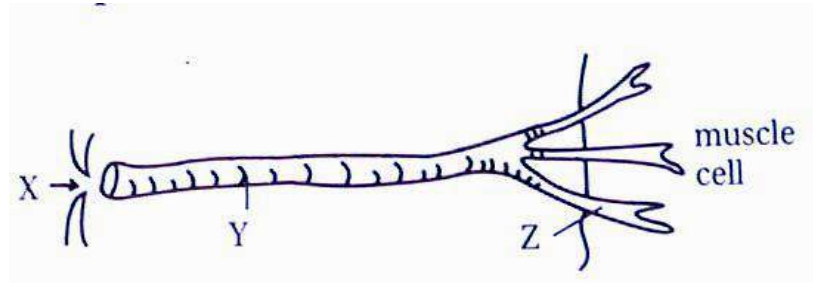


Diagram 6

Structure X, Y and Z are
(Struktur X, Y dan Z adalah)

- A valve, trachea, tracheole
(injal, trakea, trakeol)
- B spiracle, valve, tracheole
(spirakel, injap, trakeol)
- C spiracle, trachea, tracheole
(spirakel, trakea, trakeol)
- D spiracle, bronchus, bronchiole
(spirakel, bronkus, bronkiol)

14. Diagram 7 shows a pyramid number .

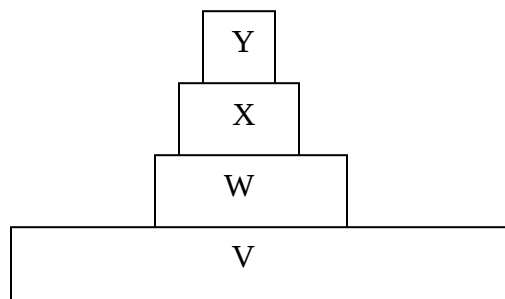


Diagram 7

Which of the following is **true** about the organisms in the pyramid in Diagram 7?
(Antara berikut yang manakah **benar** tentang organisma dalam piramid dalam rajah 7)

	V	W	X	Y
A	Decomposer Consumer (<i>Pengurai</i> <i>sekunder</i>)	Producer (<i>Pengeluar</i>)	Primary Consumer (<i>Pengguna Primer</i>)	Secondary (<i>Pengguna</i>)
B	Autotroph (<i>Autotrof</i>)	Autotroph (<i>Autotrof</i>)	Heterotroph (<i>Heterotrof</i>)	Heterotroph (<i>Heterotrof</i>)
C	Producer (<i>Pengeluar</i>)	Primary Consumer (<i>Pengguna Primer</i>)	Predator (<i>Pemangsa</i>)	Decomposer (<i>Pengurai</i>)
D	Producer Consumer (<i>Pengeluar</i> <i>tertier</i>)	Primary Consumer (<i>Pengguna Primer</i>)	Secondary Consumer (<i>Pengguna sekunder</i>)	Tertiary (<i>Pengguna tertier</i>)

15. What is the correct sequence of ecological change that occurs to a barren land over a long period of time?
(Apakah urutan perubahan ekologi yang berlaku pada sebidang tanah gundul dalam satu tempoh masa yang agak panjang?)

- A. Colonization, climax community, succession
(*Pengkolonian, komuniti klimaks, sesaran*)
- B. Succession, colonization, climax community
(*Sesaran, pengkolonian, komuniti klimaks*)
- C. Colonization, succession, climax community
(*Pengkolonian, sesaran, komuniti klimaks*)
- D. Succession, climax community, colonization
(*Sesaran, komuniti klimaks, pengkolonian*)

16. Which activity does **not** cause water pollution?
(Aktiviti manakah tidak menyebabkan pencemaran air?)

- A. Dumping of rubbish into rivers
(*Membuang sampah ke dalam sungai*)
- B. Release of nitrogen oxide by cars
(*Pembebasan gas nitrogen oksida oleh kereta*)
- C. Release of untreated industrial waste
(*Pembebasan sisa buangan industri yang tidak dirawat sebelum buang*)
- D. Excessive usage of herbicides in farms
(*Penggunaan racun serangga yang berlebihan di ladang*)

17. Diagram 8 shows a section through a human heart.
(Rajah 8 menunjukkan keratan melalui jantung manusia.)

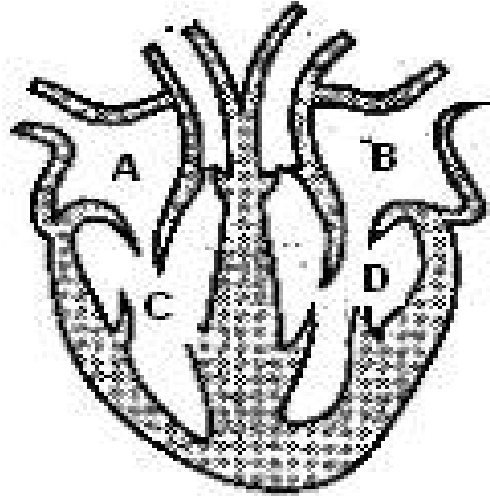


Diagram 8

Which chamber of the heart pumps blood to the lungs?
(Ruangan jantung manakah mengepam darah ke peparu?)

18. Diagram 9 shows the concentration of antibody in the blood after two antiserum injections.
(Rajah 9 menunjukkan kepekatan antibodi dalam darah selepas dua suntikan Antiserum))

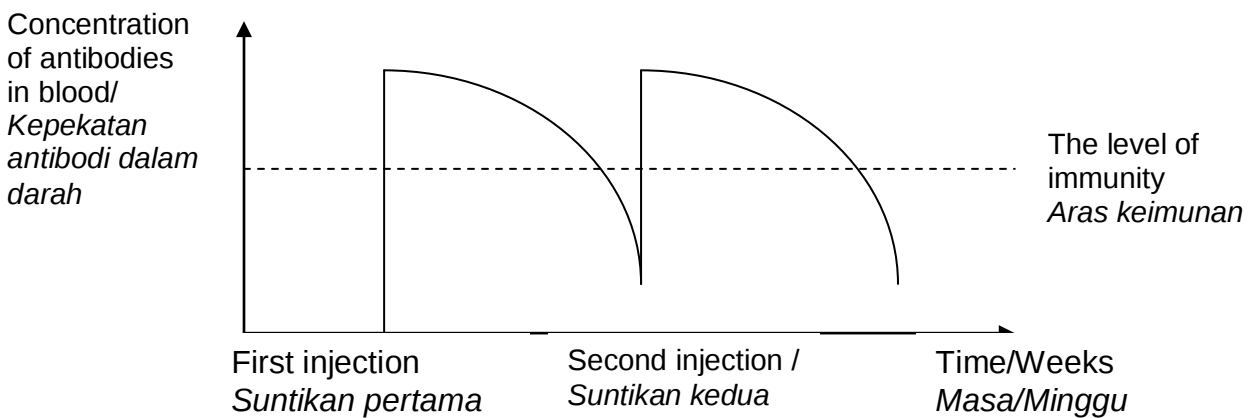


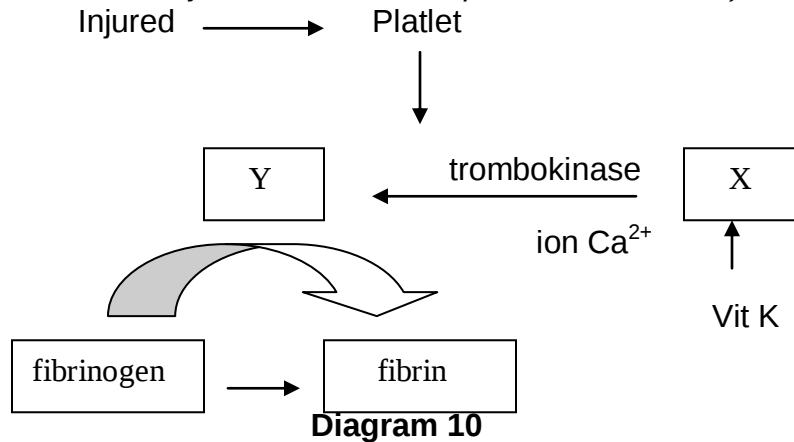
Diagram 9

What type of immunity shown in the diagram above?
(Apakah jenis keimunan yang ditunjukkan dalam rajah di atas?)

- A. Artificial acquired active immunity
(Keimunan aktif buatan)
- B. Artificial acquired passive immunity
(Keimunan pasif buatan)
- C. Natural acquired active immunity
(Keimunan aktif semulajadi)
- D. Natural acquired passive immunity
(Keimunan pasif semulajadi)

19. Diagram 10 shows a schematic diagram to illustrate the mechanism of blood clotting.

(Rajah 10 menunjukkan mekanisma pembekuan darah.)



What is represented by X and Y?
(Apakah yang diwakili oleh X dan Y?)

	X	Y
A	Globulin	Trombin
B	Trombin	Globulin
C	Trombin	Protrombin
D	Protrombin	Trombin

20. Diagram 11 shows a type of vertebra.
Rajah 11 menunjukkan sejenis vertebra.

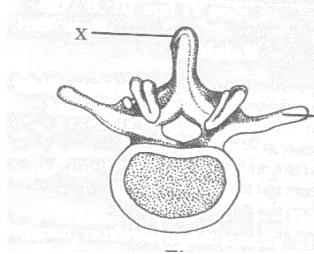


Diagram 11

The vertebra shown is
(Vertebra yang ditunjukkan adalah)

- | | |
|------------------------|-----------------------|
| A. Lumbar
(Lumbar) | B. Thorax
(Toraks) |
| C. Cervix
(Serviks) | D. Sacrum
(Sakrum) |
21. Diagram 12 shows four types of human bones
(Rajah 12 menunjukkan empat jenis tulang manusia)

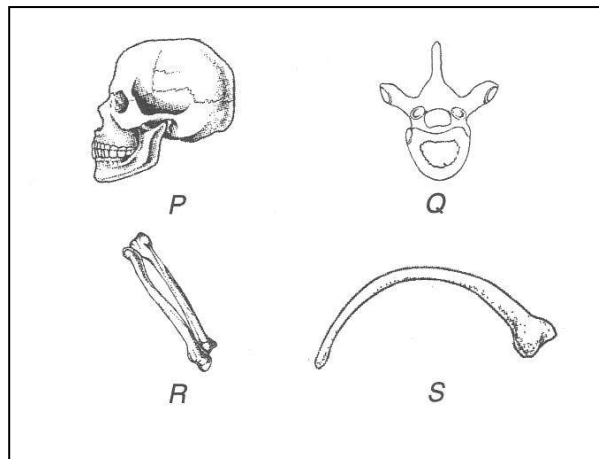


Diagram 12

Which bones are parts of the axial skeleton?
(Tulang yang manakah adalah sebahagian tulang axial)

- A. P and Q only
 B. R and S only
 C. P, Q and S only
 D. Q, R and S only

22. Diagram 13 shows the human reproductive system.
(Rajah 13 menunjukkan sistem pembiakan manusia)

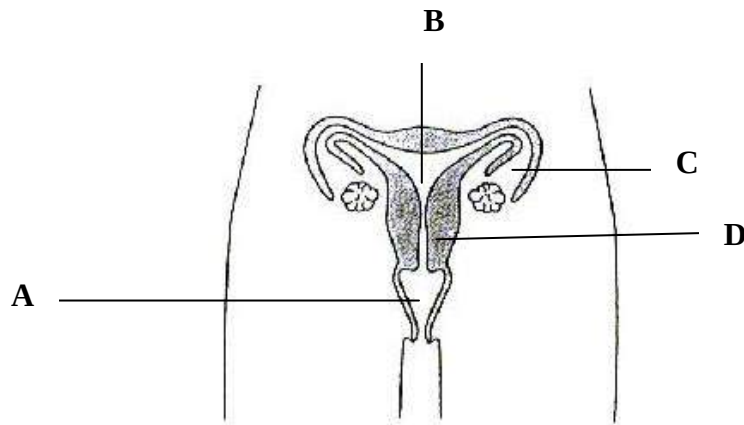


Diagram 13

The above diagram is labelled A, B, C and D. Where implantation does occurs?

(Rajah di atas berlabel A, B, C dan D. Di manakah berlakunya proses implantasi ?)

23. Which of the following sequence is the development of the human zygote?
(Antara turutan berikut, yang manakah peringkat perkembangan zigot?)

- | | | | | |
|---|-------------------|-------------------------------|-------------------------------|-------------------------------|
| A | Zygote
(Zigot) | → morula
(morula) | → blastocyst
(blastosista) | → embryo
(embrio) |
| B | Zygote
(Zigot) | → blastocyst
(blastosista) | → morula
(morula) | → embryo
(embrio) |
| C | Zygote
(Zigot) | → morula
(morula) | → foetus
(fetus) | → embryo
(embrio) |
| D | Zygote
(Zigot) | → embryo
(embrio) | → foetus
(fetus) | → blastocyst
(blastosista) |

24. During secondary growth in plants, what gives rise to secondary phloem and xylem?

(Semasa peringkat pertumbuhan sekunder bagi tumbuhan, apakah yang menambahkan tisu floem sekunder dan xylem sekunder?)

- | | |
|---------------------------------|--|
| A Cork
Gabus | C Apical meristem
Meristem apeks |
| B Cork cambium
Kambium gabus | D Vascular cambium
Kambium vaskular |

25. A girl with blood group of A has ..

Seorang budak perempuan dengan darah kumpulan A mengandungi

- A. antigen A and antibody B
antigen A dan antibodi B
- B. antigen B and antibody A
antigen B dan antibodi A
- C. antigen B and antibody B
antigen B dan antibodi B
- D. antigen B and antibody A and B
antigen B dan antibodi A dan B

Section B

26.

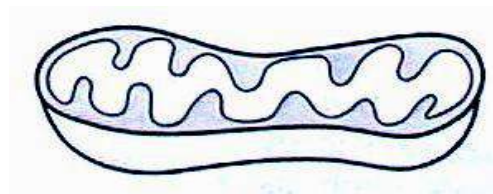


Diagram 14

The organelle shown in Diagram 14 above diagram is found in abundance in.....
(Organel yang ditunjukkan di Rajah 14 di atas terdapat dengan banyaknya di)

- I sperm cells
(sel sperma)
 - II cells in the meristems
(Sel di dalam meristem)
 - III epidermal cells of the skin
(sel epidermal pada kulit)
 - IV flight muscle cells of birds
(Sel otot terbang burung)
- A. I and II
 - B. I and III
 - C. I, II and III
 - D. I, II and IV



I	to remove metabolic wastes (untuk menyingkirkan hasil buangan metabolik)
II	to defend the body against diseases (untuk pertahanan badan melawan penyakit)
III	to transport oxygen to the body cells (untuk mengangkut oksigen ke sel-sel badan)
IV	to help regulate the volume and composition of blood (untuk membantu mengawalatur jumlah dan komposisi darah)
A	I and II
B	I and IV
C	II and IV
D	III and IV

Diagram illustrating the Na⁺ pump mechanism. The pump is shown in three states: 1. Open to the inside of the cell, binding Na⁺ ions. 2. Bound to ATP, which provides energy for the pump to change shape. 3. Open to the outside of the cell, releasing Na⁺ ions. The diagram shows the pump moving Na⁺ from the inside to the outside of the cell.

Which of the following is **not** true?
Antara berikut manakah yang tidak benar?

- A. Sodium ions are transported by the carrier protein
(Ion sodium diangkut oleh protein pembawa)
- B. The outside of a cell has a higher concentration of sodium ions than the inside of the cell.
(Bahagian luar sel mengandungi kepekatan ion sodium yang lebih tinggi dari bahagian dalam sel)
- C. The sodium ions move from a region of higher concentration to a region of lower concentration
(Ion sodium berpindah dari kawasan berkepekatan tinggi ke kawasan berkepekatan rendah.)
- D. Energy from the ATP (Adenosine triphosphate) molecule causes the shape of the carrier protein to change.
(Tenaga dari molekul ATP (Adenosina trifosfat) menyebabkan bentuk protein pembawa berubah.)

29. Diagram 17 shows the percentage of red blood cells undergoing haemolysis in various concentrations of salt solution.
(Rajah 17 menunjukkan peratus sel darah merah yang menjalani hemolisis dalam pelbagai kepekatan larutan garam yang berlainan.)

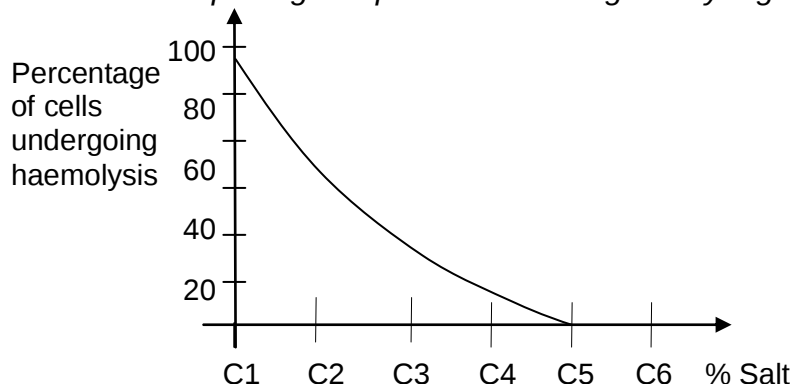


Diagram 17

Which of the following statements is **true**?
(Antara pernyataan berikut yang manakah benar?)

- A C1 is isotonic to the red blood cells
(C1 adalah isotonic kepada sel darah merah)
- B C3 is hypertonic to the red blood cells
(C3 adalah hipertonik kepada sel darah merah)
- C At C5, same number of water molecules moving in and out of the red blood cells
(pada C5, bilangan molekul air yang sama bergerak keluar dan masuk dalam sel darah merah)
- D At C6, more water molecules moving in than those moving out of the red blood cells
(Pada C6 lebih banyak molekul air bergerak masuk kedalam sel darah dari bergerak keluar dari sel darah merah)

30. Table 2 shows changes in a cell during mitosis
(Jadual 2 menunjukkan perubahan sel semasa mitosis.)

Stages (Peringkat)	P	Q	R	S
Structure in cell (Struktur dalam sel)				
Cytoplasm (Sitoplasma)	Does not divides (Tidak membahagi)	Does not divides (Tidak membahagi)	Does not divides (Tidak membahagi)	Divides (Membahagi)
Chromosomes (Kromosom)	Randomly distributed in Cell (Tersebar rawak dalam sel)	Move towards cell poles (Bergerak ke kutub sel)	At the equator off the cel (Di khatulistiwa sel)	At all poles (Di kutub Sel)
Spindles fibre (Gentian Gelendung)	Present (Ada)	Present (Ada)	Present (Ada)	Nil (Tiada)
Nucleus membrane (Membran Nukleus)	Nil (Tiada)	Nil (Tiada)	Nil (Tiada)	Present (Ada)

Table 2

What are P,Q,R and S?
(Apakah peringkat P,Q,R dan S?)

	P	Q	R	S
A	Telophase (Telofasa)	Metaphase (Metafasa)	Prophase (Profasa)	Anaphase (Anafasa)
B	Anaphase (Anafasa)	Prophase (Profasa)	Telophase (Telofasa)	Metaphase (Metafasa)
C	Prophase (Profasa)	Anaphase (Anafasa)	Metaphase (Metafasa)	Telophase Telofasa
D	Metaphase (Metafasa)	Telophase Telofasa	Anaphase (Anafasa)	Prophase (Profasa)

- 31 Diagram 18 shows a process during meiosis.
(Rajah 18 menunjukkan satu proses semasa meiosis.)

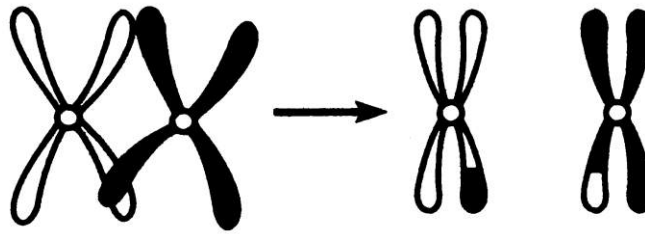


Diagram 18

Which of the following statements **do not** describe the process?
(Antara berikut, kenyataan manakah yang tidak menggambarkan proses tersebut?)

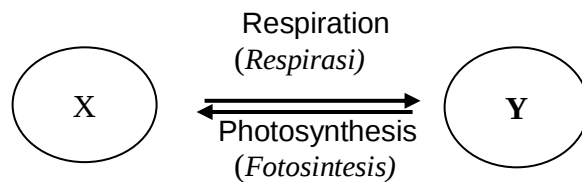
- A Crossing over occurs
(Berlaku pindah silang)
 - B It happens in prophase I
(Berlaku semasa profasa I)
 - C Change of genetic material occurs
(Berlaku pertukaran bahan genetik)
 - D Chromosome replication takes place
(Berlaku replikasi kromosom)
- 32 Which are the differences between mitosis and meiosis?
(Manakah antara berikut merupakan perbezaan antara mitosis dan meiosis?)

	Mitosis	Meiosis
I	One division (Satu pembahagian)	Two division (Dua pembahagian)
II	Chromosomes separate and move to poles (Kromosom berpisah dan bergerak menuju ke kutub- kutub)	Chromatids separate and move to opposite poles (Kromatid berpisah dan bergerak menuju kepada kutub yang bertentangan)
III	Daughter cells are $2n$ (Sel anak adalah $2n$)	Daughter cells are n (Sel anak adalah n)
IV	Parent cell is $2n$ (Sel induk adalah $2n$)	Parent cell is n (Sel induk adalah n)

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

33. The following information shows the relationship between the processes of photosynthesis and cell respiration.

(Maklumat berikut menunjukkan hubungan antara proses fotosintesis dan respirasi sel.)



Which of the following is represented by X and Y?

(Manakah antara berikut yang menunjukkan X dan Y?)

	X	Y
A	Glucose, oxygen (Glukosa, oksigen)	Water, carbon dioxide (Air, Karbon Dioksida)
B	Glucose, oxygen (Glukosa, oksigen)	Water, carbon dioxide, energy (Air, Karbon Dioksida, tenaga)
C	Glucose, carbon dioxide (Glukosa, Karbon Dioksida)	Glucose, oxygen, energy (Glukosa, Oksigen, Tenaga)
D	Starch, energy (Kanji, Tenaga)	Carbon dioxide, energy (Karbon Dioksida, Tenaga)

34. The graph in Figure 19 shows the concentration of lactic acid in the blood of an athlete.

(Graf pada Rajah 19 menunjukkan kepekatan asid laktik di dalam darah seorang atlit.)

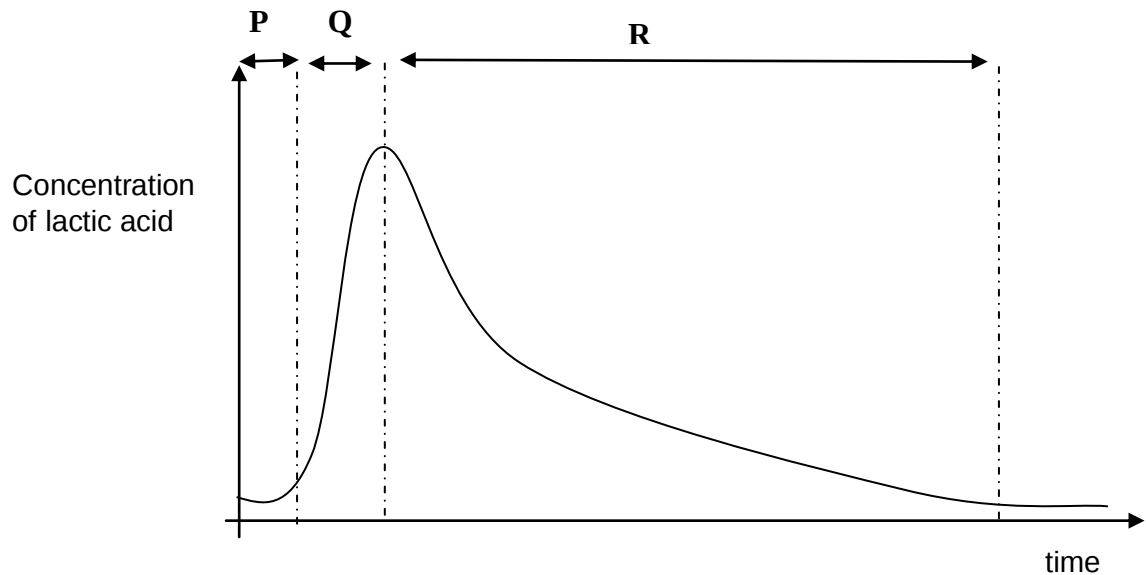


Figure 19

During which period of time was the athlete exercising?

(Pada tempoh masa manakah atlit itu melakukan latihan)

- | | | | |
|---|----------------------------|---|------------------------------------|
| A | Period P
(Tempohmasa P) | B | Period Q
(Tempohmasa Q) |
| C | Period R
(Tempohmasa R) | D | Period P + Q
(Tempohmasa P + Q) |
35. Which is the correct hierarchy from the smallest to the largest unit?
(Manakah merupakan hierarki dari unit paling kecil sehingga unit paling besar yang betul.)
- A Genus → species → order → family → class → phylum → kingdom
- B Species → genus → family → order → class → phylum → kingdom
- C Species → genus → order → family → class → phylum → kingdom
- D Species → genus → order → class → family → phylum → kingdom

36. Diagram 20 shows a blood circulatory system in human.
(Diagram 20 menunjukkan sistem peredaran darah dalam manusia)

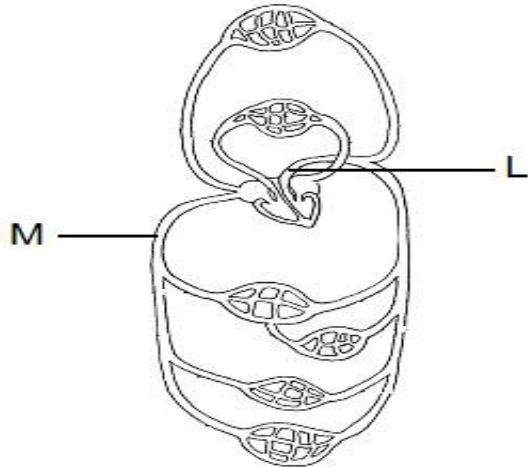


Diagram 20

Which of the following is **TRUE** about blood flow and blood pressure at L and M?
Antara berikut manakah yang **benar** tentang peredaran darah dan tekanan darah pada L dan M

	L		M	
	Blood flow (Pengaliran darah)	Blood pressure (Tekanan darah)	Blood flow (Pengaliran darah)	Blood pressure (Tekanan darah)
A	Fast (Cepat)	High (Tinggi)	Slow (Perlahan)	Low (Rendah)
B	Fast (Cepat)	Low (Rendah)	Slow (Perlahan)	Low (Rendah)
C	Slow (Perlahan)	High (Tinggi)	High (Tinggi)	High (Tinggi)
D	Slow (Perlahan)	Low (Rendah)	High (Tinggi)	High (Tinggi)

37. Diagram 21 shows muscles in the hind leg of a grasshopper.
(Rajah 21 menunjukkan otot pada kaki lompat seekor belalang.)

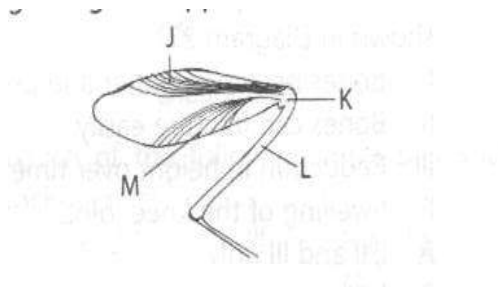


Diagram 21

Which of the following statements are true about the diagram?
(Manakah antara pernyataan berikut benar tentang rajah di atas?)

I	M contracts and propels the grasshopper into the air (<i>M mengecut dan mendorong belalang terbang</i>)
II	P contracts and propels the grasshopper into the air (<i>P mengecut dan mendorong belalang terbang</i>)
III	When P contracts, the hind leg is folded into a Z (<i>Bila P mengecut, kaki lompat dilipat berbentuk Z</i>)
IV	When M contracts, the legs jerks backwards (<i>Bila M mengecut, menolak kaki belakang dengan pantas</i>)

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

- 38 Diagram 22 shows a human brain
Rajah 22 menunjukkan otak manusia.



Diagram 22

What is being controlled by X?

Apakah yang dikawal oleh X?

- A. Making judgment
(*Membuat penilaian*)
- B. Breathing
(*Pernafasan*)
- C. Control balance
(*Mengawal keseimbangan*)
- D. Involuntary actions
(*Tindakan luarkawal*)

— X

- 39 Which of the following is **not** the difference between the endocrine system and the nervous system?

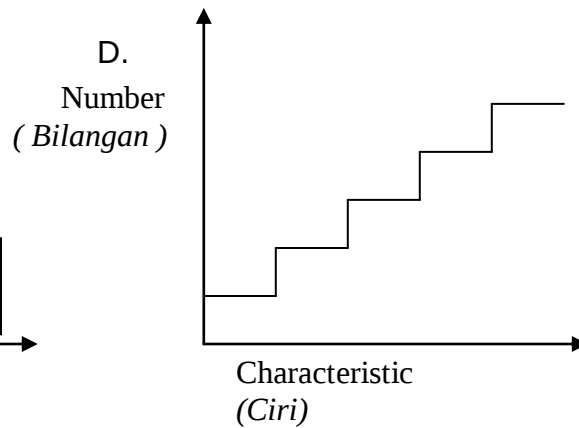
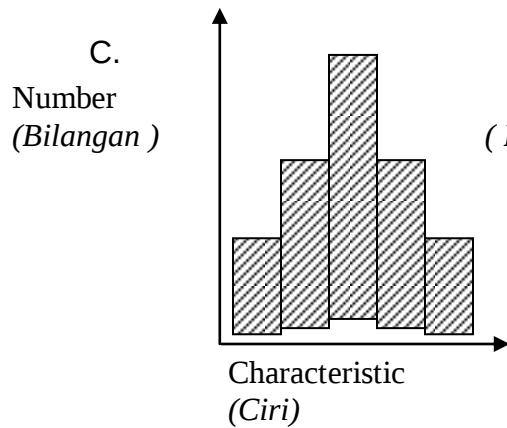
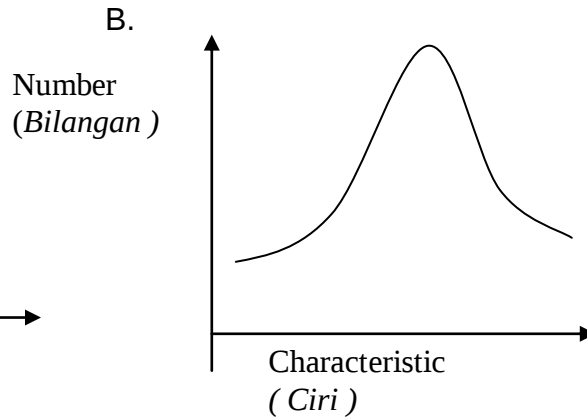
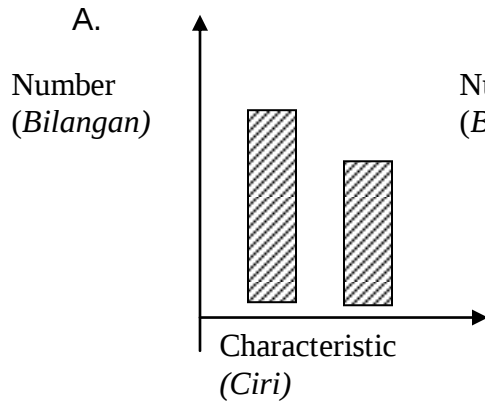
(*Antara berikut , yang manakah **bukan** perbezaan antara sistem endokrin dan sistem saraf?*)

Endocrine system
 (*Sistem Endokrin*)

Nervous system
 (*Sistem saraf*)

- | | | |
|---|--|--|
| A | Consist of endocrine glands
(<i>Terdiri daripada kelenjar endokrin</i>) | Consist of neurons
(<i>Terdiri daripada neuron</i>) |
| B | Information is passed as hormones
(<i>Utusan terhasil dalam bentuk hormon</i>) | Information is passed as electrical signals
(<i>Utusan terhasil dalam bentuk impuls elektrik</i>) |
| C | The responses is initiated rapidly slowly
(<i>Masa yang diambil untuk gerak balas gerak balas adalah singkat</i>) | The responses is initiated
(<i>Masa yang diambil untuk gerak balas adalah panjang</i>) |
| D | The response may carry on for a long time
(<i>Gerak balas berkesan untuk jangka masa yang panjang</i>) | The response is short lived
(<i>Gerak balas berkesan untuk jangka masa yang pendek</i>) |

40. Which of the following shows a variation caused by genetic factor only?
 (Antara berikut yang manakah menunjukkan variasi yang disebabkan oleh faktor genetik sahaja ?)



SECTION C

41. Diagram 23 shows the process of synthesis and secretion of enzyme in a cell.

(Diagram 23 menunjukkan proses sintesis dan rembesan enzim di dalam sel.)

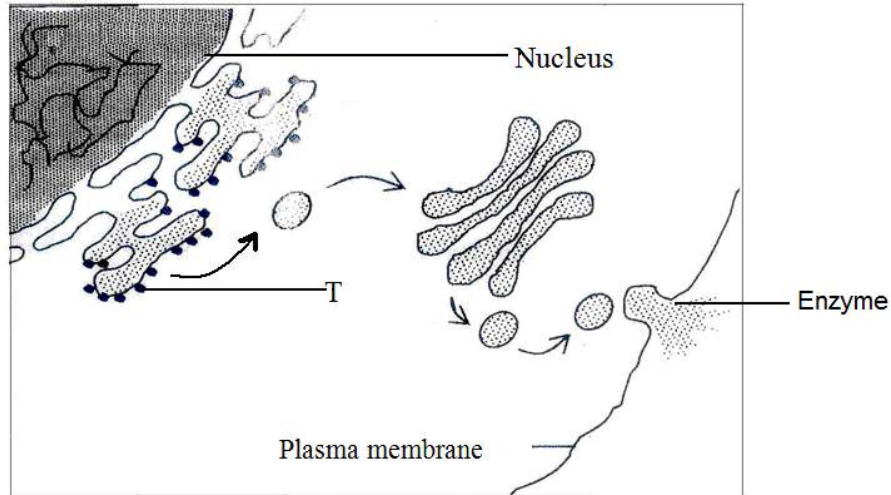


Diagram 23

What will happen if organelle T is not present?

(Apa akan berlaku jika organel T tidak hadir?)

- A. Energy cannot be generated
(Tenaga tidak boleh dihasilkan)
 - B. Enzyme cannot be synthesized
(Enzim tidak boleh disintesis).
 - C. Protein synthesized cannot be modified
(Sintesis protein tidak boleh diubahsuaikan)
 - D. Protein synthesized cannot be transported
(Hasilan sintesis protein tidak boleh diangkut)
42. The following information shows the results of an experiment to determine The energy value of cashew nuts.
- (Maklumat berikut menunjukkan keputusan eksperimen untuk menentukan nilai tenaga bagi kacang)

Volume of water used (Isipadu air yang digunakan)	= 20.0 cm ³
Mass of cashew nuts (Jisim kacang gajus)	= 0.4 g

Initial temperature of water (Suhu awal air)	= 30°C
Final temperature of water (Suhu akhir air)	= 70°C

[Specific heat of water = 4.2J/g/°C]

The energy value of the cashew nuts is

(Nilai tenaga kacang ialah)

- A 0.1 kJ / g C 2.0 kJ / g
B 8.4 kJ / g D 13.4 kJ / g

- 43 Diagram 24 shows the arrangement of apparatus to measure the percentage of certain gas in the air.
(Rajah 24 menunjukkan radas untuk pengukuran peratus gas tertentu di dalam udara.)

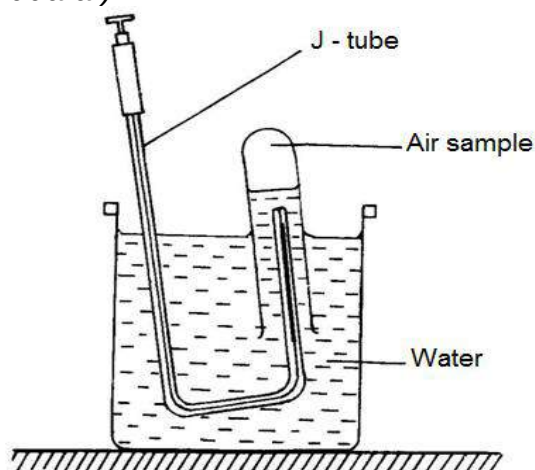


Diagram 24

Initial length of the air column10.00cm

(Panjang awal kolum udara..... 10.00cm)

Length of air column after using potassium hydroxide solution.....9.80cm

(Panjang kolum udara setelah larutan kalium hidroksida digunakan...9.80cm)

Length of air column after using alkaline potassium pyrogallate.....7.80cm

(Panjang kolum udara setelah alkali kalium pirogalol digunakan.....7.80cm)

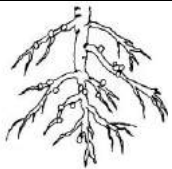
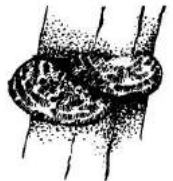
- A. 12 %
- B. 16 %
- C. 18 %
- D. 20 %

44. The following characteristic enables the organisms to survive in its habitat.
(Ciri-ciri penyesuaian berikut membolehkan organisma hidup di habitatnya)

- I Has a modified part to store water
(Mempunyai bahagian yang diubahsuai untuk menyimpan air)
- II Produce spore
(Menghasilkan spora)
- III Has hyphae to absorb nutrients
(mempunyai hifa untuk menyerap nutrient)
- IV Has nodule
(Mempunyai nodul)

Which of the suitable characteristic enables organisms to survive in their habitat

(Antara berikut yang manakah ciri penyesuaian yang sesuai untuk membolehkan organisma hidup di habitatnya.)

	ORGANISMS ORGANISMA	CHARACTERISTICS CIRI-CIRI
A		I, II and III
B		II, III and IV
C		III and IV
D		II and III

45. The CFCs in the air condition of refrigerator have been replaced by HCFC.
(Kandungan CFC di dalam peti sejuk telah digantikan penggunaannya dengan HCFC.)

Which of the following statement explains the reason for the replacement?
(Di antara pernyataan berikut yang manakah menerangkan sebab penggantian bahan tersebut?)

- A. HCFC reduce emission of chlorine that cause thinning of ozone layer
(HCFC mengurangkan pelepasan klorin yang boleh menyebabkan penipisan lapisan ozon)
- B. HCFC is not easily broken by the UV and help maintain the ozone layer
(HCFC tidak dapat diuraikan dengan mudah oleh sinaran UV dan mengekalkan lapisan ozon)
- C. HCFC is a lot cooler gas compared to CFC
(HCFC lebih menyejukkan berbanding CFC)
- D. HCFC is heavy gas so it does not rise to ozone
(HCFC tidak sampai ke lapisan ozon kerana HCFC adalah gas yang berat)

46. Diagram 25 shows a blood circulatory system of an animal.
(Rajah 25 menunjukkan system peredaran darah bagi suatu sistem haiwan.)

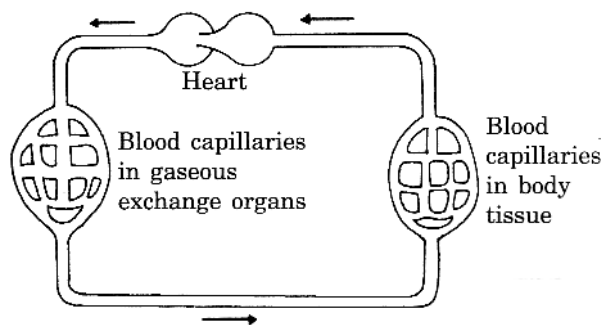


Diagram 25

Which of the characteristics is true about the blood circulatory system both in man and the animal in Diagram 25?

(Antara ciri-ciri berikut yang manakah benar tentang sistem peredaran darah manusia dan haiwan dalam Rajah 25?)

- A Heart pumps out a mixture of oxygenated and deoxygenated blood
(Jantung mengepam campuran darah beroksigen dan terdeoksigen)
- B Blood enters the gaseous exchange organ at low pressure
(Darah yang memasuki organ pertukaran gas bertekanan rendah)
- C It is a double blood circulatory system
(Merupakan sistem peredaran darah ganda dua)
- D It is a closed blood circulatory system
(Merupakan sistem peredaran darah tertutup)

47. Diagram 26 shows the movement of a frog.
Rajah 26 menunjukkan pergerakan katak

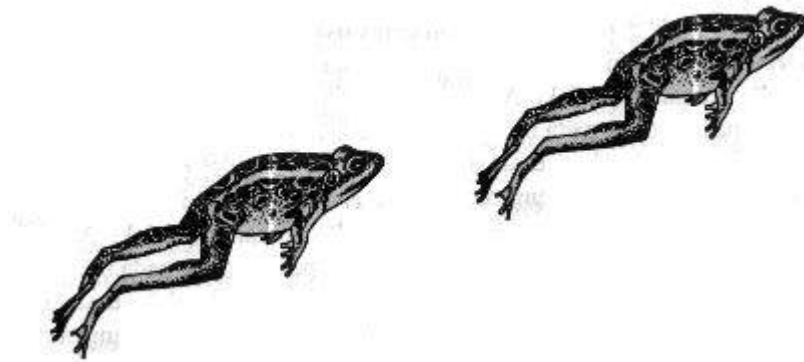


Diagram 26

Which of the following enables the above movement?

(Antara berikut yang manakah membolehkan berlakunya pergerakan di atas ?)

- I Compact foot bone
(Tulang kaki yang padat)
 - II The hind leg folded into a "Z" shape
(Kaki belakang dilipat berbentuk Z)
 - III The muscle of front leg is small
(Otot kaki hadapan yang kecil)
 - IV The hind leg has well developed muscle
(Kaki belakang mempunyai otot yang berkembang maju)
- A. I and II
 B. II and III
 C. II and IV
 D. I, III and IV
48. Diagram 27 shows the structure of a nephron
(Rajah 27 menunjukkan struktur satu nefron.)

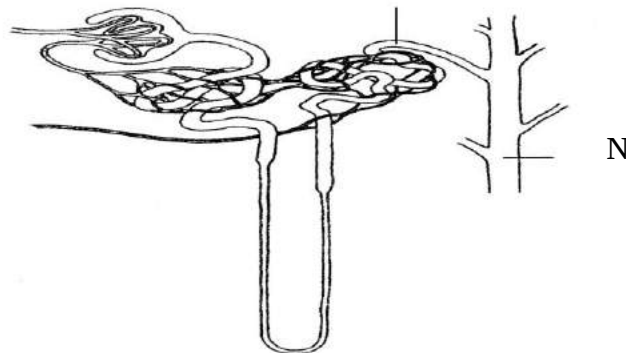


Diagram 27

Which off the following activities cause N to be more permeable to the water?

(Antara aktiviti berikut, yang manakah akan menyebabkan X lebih telap kepada air?)

- P – Drinking a lot of water
(Minum air dengan banyak)
Q – Eating salty foods
(Makan makanan yang masin)
R – Not exercising
(Tidak melakukan senaman)
S – Playing sports
(Bersukan)

- A P and R
B P and S
C Q and R
D Q and S

49. Diagram 28 shows the inheritance of dimpled trait.
(Rajah 28 menunjukkan pewarisan trait berlesung pipit)

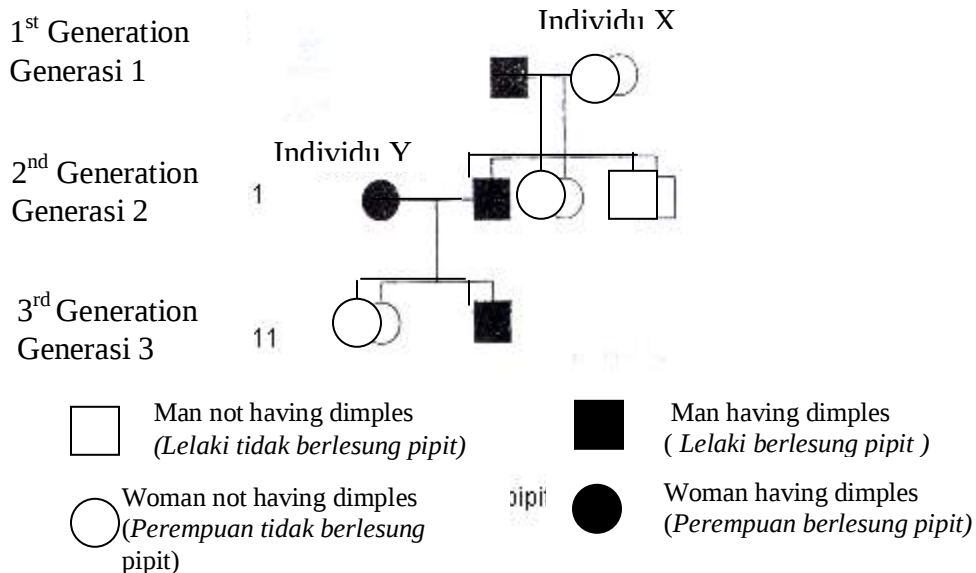
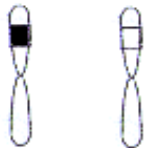
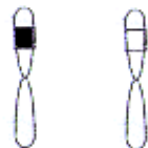
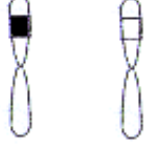
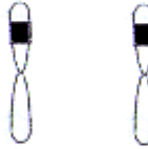
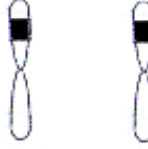
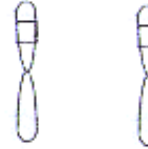
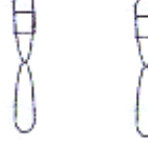
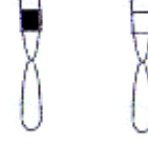


Diagram 28

Having dimples is dominant and is represented by H whereas not having dimples is represented by h. Which below is genotype for person X and Y?

(Berlesung pipit adalah dominan dan diwakili H manakala tidak berlesung pipit diwakili h. Antara berikut yang manakah genotip individu X dan Y?)

	Individu X	Individu Y
A		
B		
C		
D		

- 50 Diagram 29 shows part of a family tree showing the distribution of blood groups. R, S, T, U, V, W, X, Y and Z are members of the family.
(Diagram 29 menunjukkan salasilah kumpulan darah satu keluarga. R, S, T, U, V, W, X, Y dan Z adalah ahli sebuah keluarga ?)

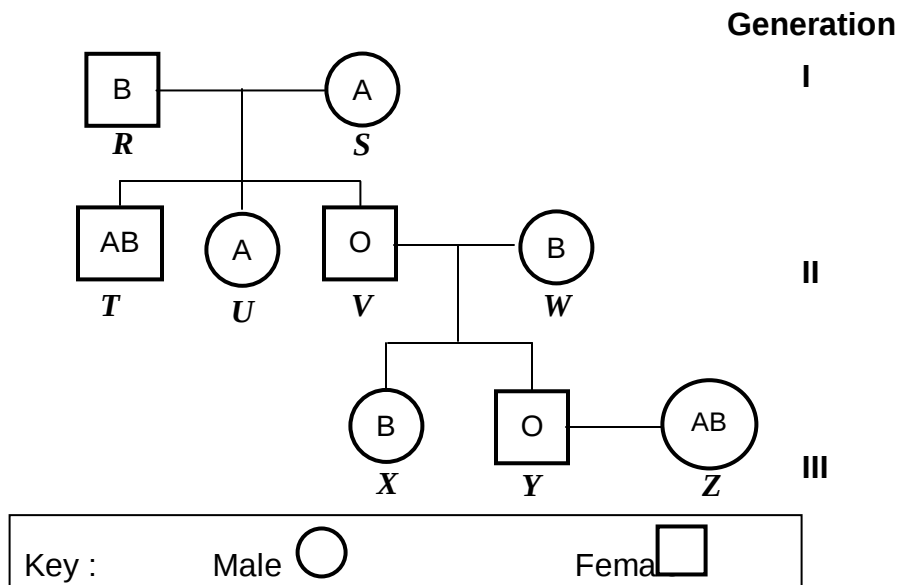


Diagram 29

What is the genotype of S and W?
(Apakah genotip bagi S dan W?)

	Individual S	Individual W
A	AA	BB
B	AO	BO
C	AA	BO
D	AO	BB

END OF QUESTION PAPER

SULIT

Name:.....

4551/2

Form :.....

Biology

Paper 2

September

2008

2 $\frac{1}{2}$ hours

Logo Sekolah

PEPERIKSAAN PERCUBAAN TAHUN 2008
TINGKATAN 5

BIOLOGY

PAPER 2

Two hours thirty minutes

DO NOT OPEN THE TEST PAPER UNTIL YOU ARE TOLD TO DO SO

1. This paper consists of two sections. **Section A and Section B.** Answer all the questions in Section A, two question in Section B.
2. Write your answers in the spaces provided for Section A. Important steps in calculations must be shown.
3. Write your answers on the separate answer sheets provided for Section B.
4. Answer Section B in detail. You may use equation, diagram, table, graph and other suitable methods to explain your answers.
5. Show your working, it may help you to get marks.
6. If you wish to change your answer, neatly cross out the answer that you have done. Then write down the new answer
7. The diagram in the questions are not drawn to scale unless stated.
8. Marks allocated for each question or part of the question are shown in brackets.
9. The time suggested to answer Section A is 90 minutes, Section B is 60 minutes.
10. The use of a non programmable calculator is permitted.

<i>For Examiner's Use</i>			
Section	Question	Full Marks	Marks Obtained
A	1	13	
	2	12	
	3	12	
	4	12	
	5	11	
B	6	20	
	7	20	
	8	20	
	9	20	
Total		100	

This Question Paper Consists of 20 Printed Pages

4551/2

[Lihat sebelah
SULIT

INFORMATION FOR CANDIDATES
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.*

Bahagian A

[60 marks]

For
examiners
use

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

- 1 Diagram 1 shows a cell from an organism.
Rajah 1 menunjukkan sejenis sel.

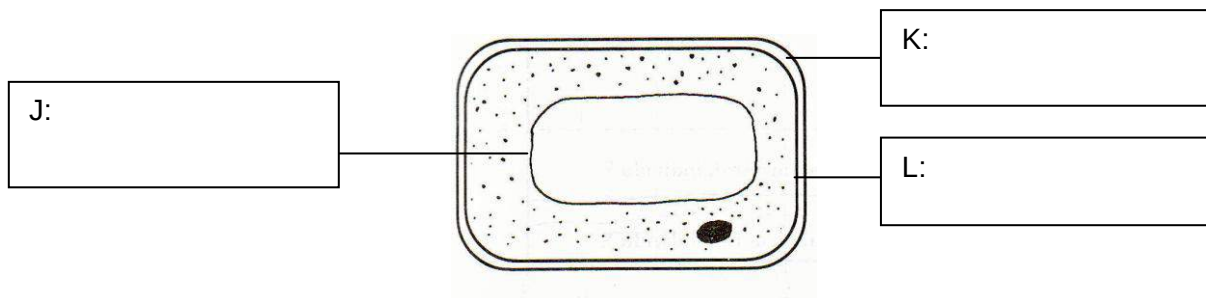


Diagram 1
Rajah 1

- (a) (i) Label J, K and L in Diagram 1.
Labelkan J, K dan L pada Rajah 1

[3 marks]

1(a)(i)

- (ii) Name the type of cell in Diagram 1.
Namakan jenis sel dalam Rajah 1.

[1 mark]

1(a)(ii)

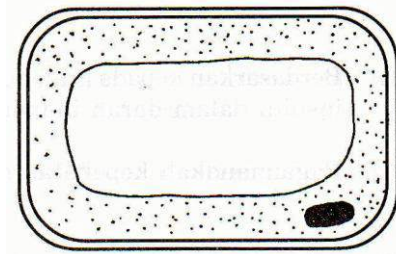
- (iii) State **two** reasons for the answer in (a)(ii).
Nyatakan **dua** alasan kepada pilihan di (a)(ii).

1 _____

2 _____

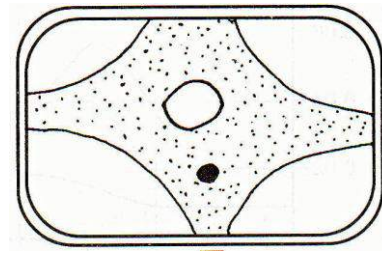
[2 marks]

1(a)(iii)



Cell in Solution A for 30 minutes
Sel dalam Larutan A selama 30 minit

Diagram 1.1
Rajah 1.1



Cell in Solution B for 60 minutes
Sel dalam Larutan B selama 60 minit

Diagram 1.2
Rajah 1.2

- (b) Diagram 1.1 shows the cell in a(ii) after it had been immersed in solution A for 30 minutes. The cell was then transferred to solution B for another 30 minutes. Diagram 1.2 shows the condition of the cell after been immersed in solution B.

Rajah 1.1 menunjukkan sel di a(ii) setelah direndam dalam larutan A selama 30 minit. Sel tersebut kemudiannya dipindahkan ke dalam larutan B selama 30 minit lagi.

Rajah 1.2 menunjukkan keadaan sel tersebut setelah direndam dalam larutan B.

- (i) Name the process of the movement of substances across the plasma membrane as shown in Diagram 1.1 and Diagram 1.2

Namakan proses pergerakan bahan merentasi membrane plasma yang ditunjukkan pada Rajah 1.1 dan 1.2.

Process : _____ [1 mark]

1 (b)(i)

- (ii) What type of solution is A and B compared to the sap of the plant?
Apakah jenis larutan A dan B berbanding sap sel tumbuhan tersebut?

Solution A / Larutan A : _____

Solution B / Larutan B : _____ [2 marks]

1 (b)(ii)

- (c) Explain what happens to the cell in Solution A as shown in Diagram 1.1.
Terangkan apa yang berlaku pada sel di dalam larutan A seperti yang ditunjukkan dalam Rajah 1.1.

[2 marks]

- (d) Explain **one** method by which mango can be preserved for a long period of time.
*Terangkan **satu** kaedah pengawetan supaya mangga boleh dapat disimpan bagi tempoh masa yang lama.*

[3 marks]

*For
examiners
use***1 (c)****1 (d)****TOTAL**

- 2 Diagram 2 shows several parts of the human digestive system P, Q, R, S, T and U.

Rajah 2 menunjukkan bahagian-bahagian dalam sistem pencernaan manusia P, Q, R, S, T dan U.

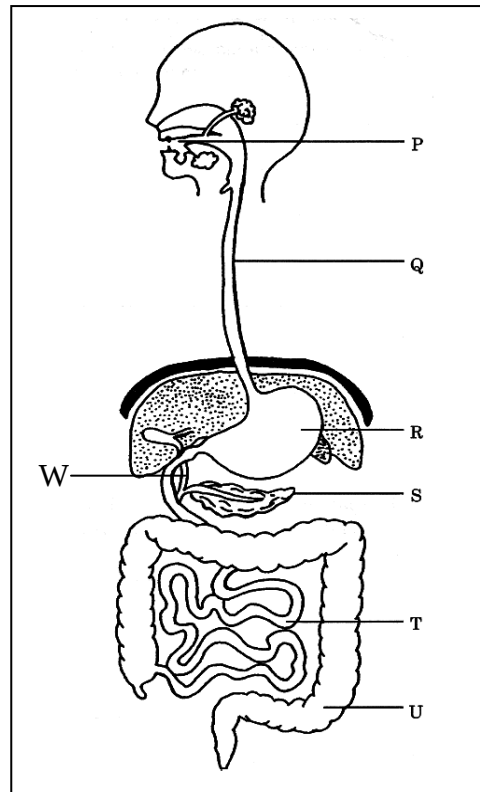


Diagram 2

Rajah 2

- (a) Name the secretion which passes down tube W and state its function.
Namakan rembesan yang dibawa oleh salur W dan nyatakan fungsinya.

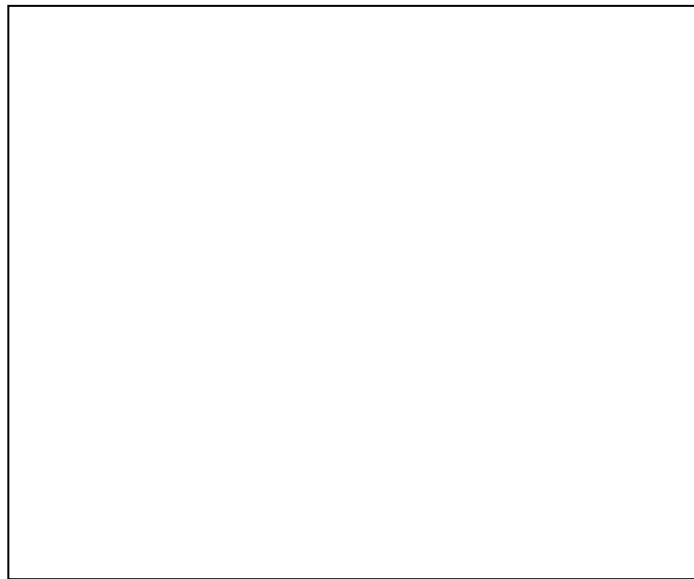
Secretion : _____

Function : _____

[2 marks]

2 (a)

- b) The structure T in Diagram 2 has numerous projections. Draw and label a longitudinal section of one of these projections in the space below.
Bahagian T pada Rajah 2 terdiri daripada banyak unjuran. Lukis dan labelkan keratan menegak satu unjuran itu di ruang kosong di bawah.



[2 marks]

2 (b)

- (c) (i) State the process that occurs in the projection drawn in (b).
Nyatakan proses yang berlaku pada unjuran yang dilukis di (b).

[1 mark]

2 (c)(i)

- (ii) State **one** characteristic of the structure T that will help the process in (c)(i) to function efficiently.
*Nyatakan **satu** ciri pada bahagian T yang membolehkan proses di (c)(i) berlaku dengan cekap.*

[1 mark]

2 (c)(ii)

- (d) As a doctor you have confirmed that a patient is suffering from a disease. Organ S of the patient has to be removed.
Anda adalah seorang doctor yang telah mengesahkan bahawa seorang pesakit mengalami sejenis penyakit. Organ S pada pesakit itu perlu dibuang.

- (i) What explanation would you give to the patient?
Apakah penerangan yang perlu anda berikan kepada pesakit itu?

In your explanation, state the effects of the removal of organ S on enzymes and hormones, and how these affect the digestion and the level of glucose in the blood.

Penerangan anda perlu menyatakan kesan pembuangan organ S terhadap enzim dan hormon, dan akibatnya kepada pencernaan serta aras glukosa dalam darah.

[4 marks]

2 (d)(i)

- (ii) What advice can you give to the patient to help him handle his health problem that may arise from the removal of organ S?

Apakah nasihat yang boleh diberikan kepada pesakit itu untuk membantunya menghadapi masalah kesihatan yang disebabkan oleh pembuangan organ S?

[2 marks]

2 (d)(ii)

- 3 Diagram 3.1 shows an importance structure in a living cell.
Rajah 3.1 menunjukkan struktur-struktur penting dalam satu sel hidup.

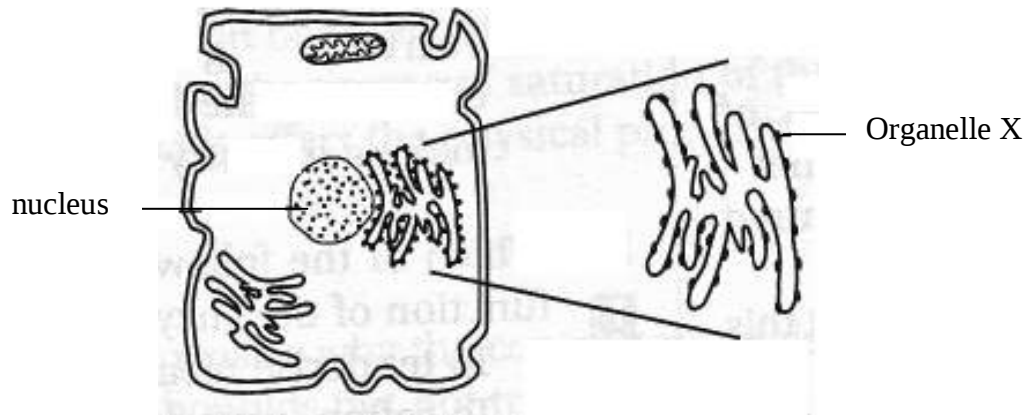


Diagram 3.1
Rajah 3.1

- (a) Name the organelles labelled J and K and state its functions.
Namakan organel yang berlabel J dan K dan nyatakan fungsinya.

J : _____

Function : _____

K : _____

Function _____

[4 marks]

3(a)

- (b) Diagram 3.2 represents the action of an enzyme. The pin represents the enzyme.
Rajah 3.2 mewakili tindakan enzim. Pin tersebut mewakili enzim.

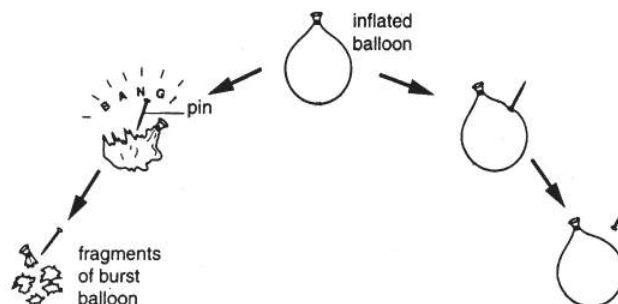


Diagram 3.2
Rajah 3.2

What is represented by
Apakah yang diwakili oleh

- (i) the inflated balloons;
Belon yang kembang;

- (ii) the fragments of burst balloon?
Cebisan belon yang pecah

[2 marks]

- (c) State **two** characteristics of enzyme.
*Nyatakan **dua** ciri enzim.*

1

2

[2 marks]

Enzymes are widely used in our daily life and industries.
Enzim banyak digunakan dalam kehidupan seharian dan dalam

- (d) Explain how enzymes act in :
Terangkan bagaimana enzim bertindak dalam :

- (i) getting rid of stains on cloth
menanggalkan kotoran pada pakaian

[2 marks]

- (ii) helping to tenderise meat during cooking .
membantu melembutkan daging yang dimasak.

[2 marks]

*For
examiners
use*

3(b)

3(c)

3(d)(i)

3(d)(ii)

TOTAL

- 4 Diagram 4 shows two different animal cells from the same animal in the process of nuclear division.

Rajah 4 menunjukkan dua sel haiwan yang berlainan dari haiwan yang sama di dalam proses pembahagian nukleus.

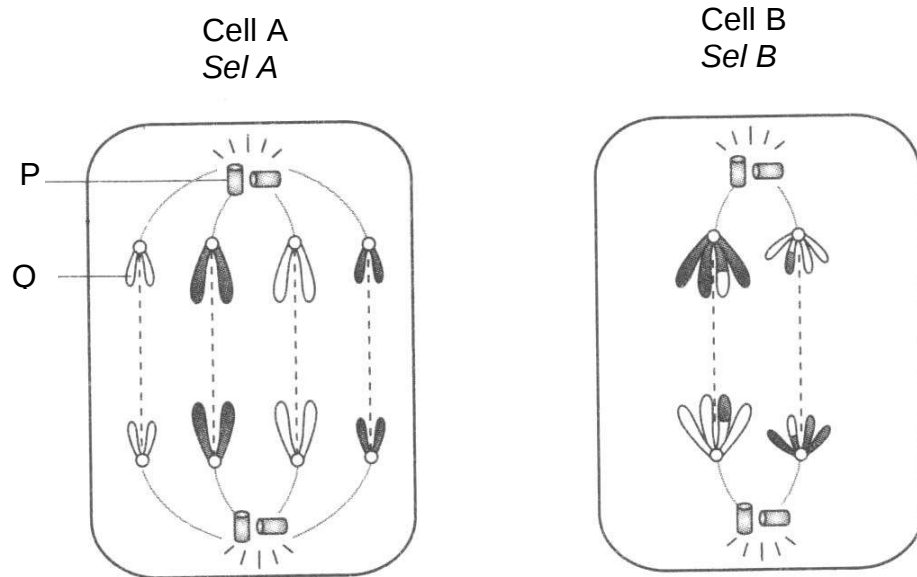


Diagram 4
Rajah 4

- (a) Name the structure labelled P and Q.
Namakan struktur yang berlabel P dan Q.

P : _____

Q : _____

[2 marks]

- (b) What type of nuclear division is shown in
Apakah jenis pembahagian sel yang ditunjukkan dalam

(i) Cell A/ Sel A?

(ii) Cell B/ Sel B?

[2 marks]

For
examiners
use

4(a)

4(b)

- (c) What stage of nuclear division is shown in
Apakah peringkat pembahagian nukleus yang ditunjukkan dalam
(i) Cell A/*Sel A*?

- (ii) Cell B/*Sel B*?

[2 marks]

4(c)

- (d) Describe the differences shown in Cell A and Cell B.
Terangkan perbezaan yang terdapat pada Sel A dan Sel B.

[2 marks]

4(d)

- (e) State **one** significance of the movement of the chromosomes in Cell B.
Nyatakan satu kepentingan pergerakan kromosom dalam Sel B.

[1 marks]

4(e)

- (f) For a plant cell where $2n=4$, draw three separate diagram to show
Untuk sel tumbuhan dimana $2n=4$, lukis tiga rajah berasingan untuk Menunjukkan
- (i) Metaphase, mitosis
Metafasa, mitosis
- (ii) Metaphase I, meiosis, and
Metafasa, meiosis, dan
- (iii) Metaphase, meiosis in three different cells of the same plant.
Metafasa, meiosis dalam tiga sel berbeza dalam tumbuhan yang sama.

For
examiners
use

(i)	(ii)	(iii)
-----	------	-------

[3 marks]

4(f)

TOTAL

- 5 Diagram 5 shows the arch reflex involved when we accidentally touch a hot kettle.
Rajah 5 menunjukkan laluan arka refleks apabila kita menyentuh cerek panas secara tidak sengaja.

For
examiners
use

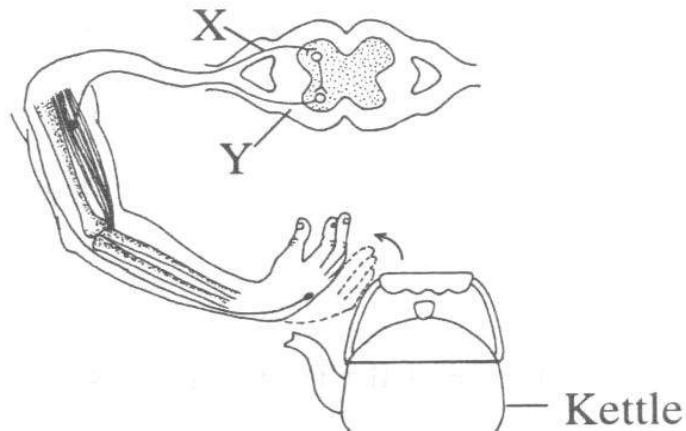


Diagram 5
Rajah 5

- (a) State the stimulated receptor in this event.
Nyatakan reseptor rangsangan dalam kejadian ini.

5(a)

[1 marks]

- (b) Explain how the arm will react in that situation.
Terangkan bagaimana lengan bertindak balas terhadap situasi tersebut.

5(b)

[5 marks]

- (c) State **two** reflex actions that are controlled by the brain.
Nyatakan dua tindak balas refleks yang mana dikawal oleh otak.

[2 marks]

- (d) Explain the possible effects if the parts of X in the spinal cord is damaged.
Terangkan kemungkinan yang berlaku apabila bahagian X saraf tunjang tercedera.

[1 marks]

- (e) Explain why the brain is not involved in controlling this reflex action.
Terangkan mengapa otak tidak terlibat dalam mengawal tindakbalas refleks ini.

[2 marks]

For
examiners
use

5(d)

5(e)

TOTAL

Section B
Bahagian B

[40 marks]

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

- 6 The following organisms are found in a paddy field community.
Organisma-organisma berikut terdapat dalam satu komuniti sawah padi.

Grasshopper, Paddy plant, Caterpillar, Frog, Owl, Snake, Rat
Belalang, Pokok padi, Beluncas, Katak, Burung hantu, Ular, Tikus

These organisms interact with each other in the community.
Organisma-organisma ini saling berinteraksi antara satu sama lain dalam komuniti tersebut.

- (a) (i) Based on the above organisms, construct :
Berdasarkan organisma-organisma di atas, bina :
- A food web showing the interaction between all the organisms
Satu jaringan makanan yang menunjukkan interaksi diantara semua organisma tersebut.
 - A pyramid of numbers consisting of four trophic levels
Satu piramid nombor yang mengandungi empat aras trof
- [4 marks]

- (ii) Grasshoppers and caterpillars are pests for paddy plants. How can the population of the grasshoppers and caterpillars be controlled? Explain the impact of the control methods on the paddy field community.

Belalang dan beluncas merupakan perosak bagi pokok padi. Bagaimanakah populasi belalang dan beluncas dapat dikawal? Terangkan impak kaedah pengawalan itu ke atas komuniti sawah padi.

[6 marks]

- (b) A paddy field area is developed into an industrial area as shown in Diagram 8.

Kawasan sawah padi dibangunkan menjadi kawasan perindustrian seperti yang ditunjukkan pada Rajah 8.

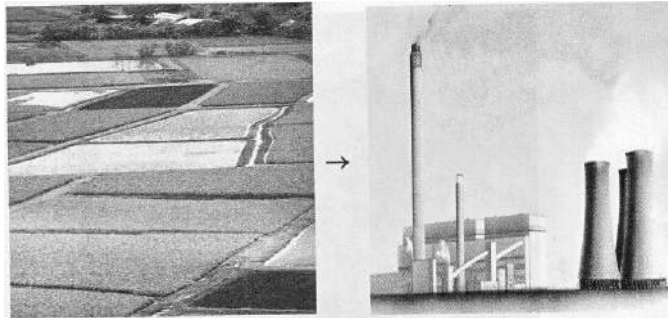


Diagram 8
Rajah 8

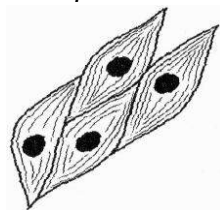
Discuss the good and the bad social, economic and environmental effects of this development.

Bincangkan kesan baik dan kesan buruk sosial, ekonomi dan persekitaran akibat pembangunan ini.

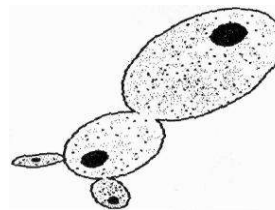
[10 marks]

- 7 (a) Diagram 7.1 shows tissue M and cell N. M is found in a multicellular organism. N is found in a unicellular organism.

Rajah 7.1 menunjukkan tisu M dan sel N. M terdapat dalam organisma multisel. N terdapat dalam organisma unisel



Tissue M



Cell N

Diagram 7.1
Rajah 7.1

- (i) Based on Diagram 7.1, explain the cellular respiration process that occurs in the following conditions:

- Respiration occurs in M during writing
- Respiration occurs in N during fermentation

Berdasarkan Rajah 7.1, terangkan perbezaan proses respirasi sel yang berlaku dalam keadaan berikut:

- *Respirasi yang berlaku dalam M semasa menulis*
- *Respirasi yang berlaku dalam N semasa penapaian*

[4 marks]

- (ii) Explain the importance of increased pulse rate during vigorous activity and why it takes several minutes for the pulse rate to return to normal after the activity.

Terangkan kepentingan untuk meningkatkan kadar denyutan nadi semasa menjalankan aktiviti cergas, dan mengapa ia memerlukan beberapa minit untuk kadar denyutan nadi kembali ke normal selepas aktiviti tersebut

[6 marks]

- (b) Diagram 7.2 shows the respiratory organs of a fish and a human.
Rajah 7.2 menunjukkan organ respirasi ikan dan manusia.

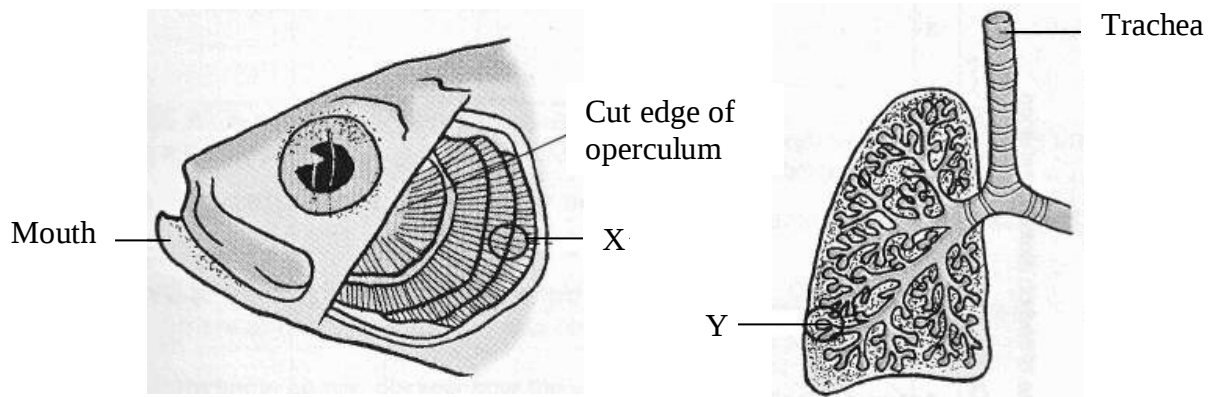


Diagram 7.2
Rajah 1

X and Y are structures which are adapted to function in their respective habitats. Compare and explain the adaptations.

X dan Y adalah struktur yang telah disesuaikan untuk berfungsi dalam habitat masing-masing. Bandingkan dan terangkan penyesuaian tersebut.

[10 marks]

- 8 (a) Menstrual cycle is regulated by hormone which is secreted by pituitary gland and ovary. Married woman usually plans their families by taking contraceptive pill.
Kitar haid dikawal oleh hormone-hormon yang dihasilkan oleh kelenjar pituitary dan ovari. Wanita berkahwin yang ingin merancang keluarga boleh menggunakan pil pencegah kehamilan.

Based on your knowledge in biology, explain how this pills react as with negative feedback to prevent pregnancy.
Berdasarkan pengetahuan anda dalam biologi, jelaskan bagaimana pil itu bertindak secara suap balik negatif untuk mencegah kehamilan

[10 marks]

- (b) (i) Describe briefly the method of *in vitro* fertilization (IVF) in human.
Terangkan secara ringkas kaedah persenyawaan in vitro pada manusia.
- (ii) Based on your knowledge in biology, what are the moral issues related to this method?
Berdasarkan pengetahuan anda dalam biologi, apakah isu-isu moral yang perlu diambil kira dalam menjalankan kaedah ini?

[10 marks]

- 9 (a) Explain why
Terangkan mengapa
- (i) the chances of having either a baby boy or girl are equal.
peluang untuk mendapatkan anak lelaki atau perempuan adalah sama banyak
- (ii) in some families, all children are of the same sex.
dalam sesetengah keluarga, kesemua anak terdiri daripada jantina yang sama.

[5 marks]

- (b) A species of a mammal has either curly hair or straight hair. The allele for curly hair (H) is dominant. Using a complete schematic genetic diagram, show how a curly-haired and straight-haired offspring is produced in the ratio of 1:1.

Sejenis spesies mamalia mempunyai kemungkinan samada rambut kerinting atau rambut lurus. Alel bagi rambut kerinting (H) adalah dominan.

Dengan menggunakan rajah skema genetik yang lengkap, tunjukkan bagaimana untuk mendapatkan anak yang berambut kerinting dan berambut lurus dalam nisbah 1:1.

[5 marks]

- (c) Diagram 8 shows the results of breeding on mice. *Rajah 8 menunjukkan hasil kacukan ke atas tikus.*

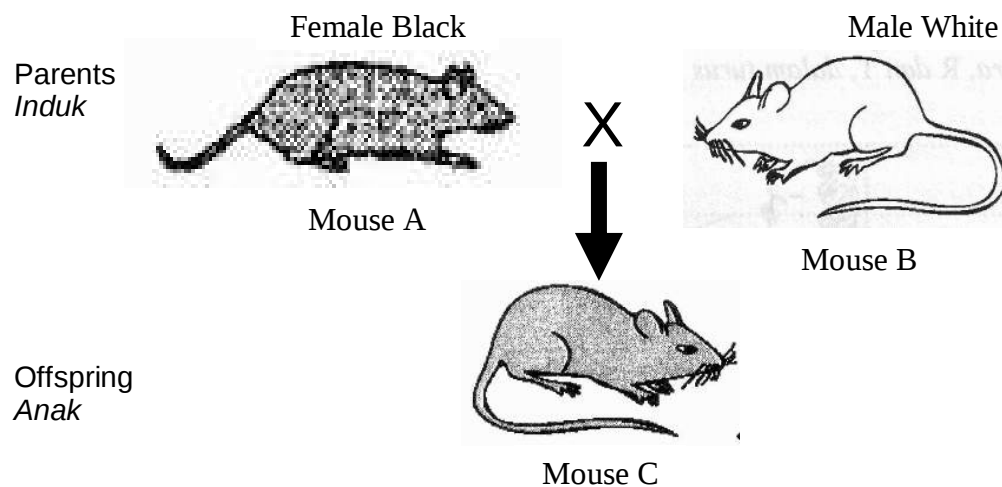


Diagram 8
Rajah 8

Based on Diagram 8 identify the different characteristics among the mouse family members. Discuss how the difference in characteristics is inherited. *Berdasarkan Rajah 8, kenalpasti ciri-ciri perbezaan di kalangan ahli keluarga tikus itu. Bincangkan bagaimana perbezaan ciri-ciri diwarisi.*

[10 marks]

END OF QUESTION PAPER

KERTAS SOALAN TAMAT

SULIT
4551/3
Biology
September
2008
1 ½ jam

NAMA :
TINGKATAN :

NAMA DAN LOGO SEKOLAH

PEPERIKSAAN PERCUBAAN 2008

TINGKATAN 5

BIOLOGY

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 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 Camouflage is an example of variation that helps organisms to ensure the survival of the species.
Penyamaran bagi organisma tertentu merupakan satu contoh variasi yang dapat menjamin kemandirian organisma tersebut.

Students X and Y carried out an experiment to study the effects of camouflage on a predator-prey relationship. The following steps were taken by the students.
Pelajar X dan pelajar Y telah menjalankan satu eksperimen untuk mengkaji kesan penyamaran ke atas hubungan antara mangsa-pemangsa. Pelajar-pelajar itu menjalankan langkah-langkah berikut:

Step 1/ Langkah 1:

Student Y scattered randomly the following coloured buttons on a piece of white cloth measuring 50 cm x 50 cm :

Pelajar Y menabur secara rawak butang-butang berwarna berikut ke atas kain putih berukuran 50 cm x 50 cm:

- 20 red buttons/ 20 butang berwarna merah
- 20 black buttons/ 20 butang berwarna hitam
- 20 white buttons/ 20 butang berwarna putih
- 20 yellow buttons/ 20 butang berwarna kuning
- 20 green buttons/ 20 butang berwarna hijau

Step 2/ Langkah 2:

Student X did not observe what student Y did. Student X then quickly took a button from the white cloth and placed it on a tile.

Pelajar X tidak melihat pelajar Y menabur butang. Kemudian pelajar X mengambil satu butang dengan cepat daripada kain putih dan kemudian meletakkannya ke atas jubin.

Step 3/ Langkah 3:

Step 2 was repeated 9 times.

Langkah 2 diulangi sebanyak 9 kali.

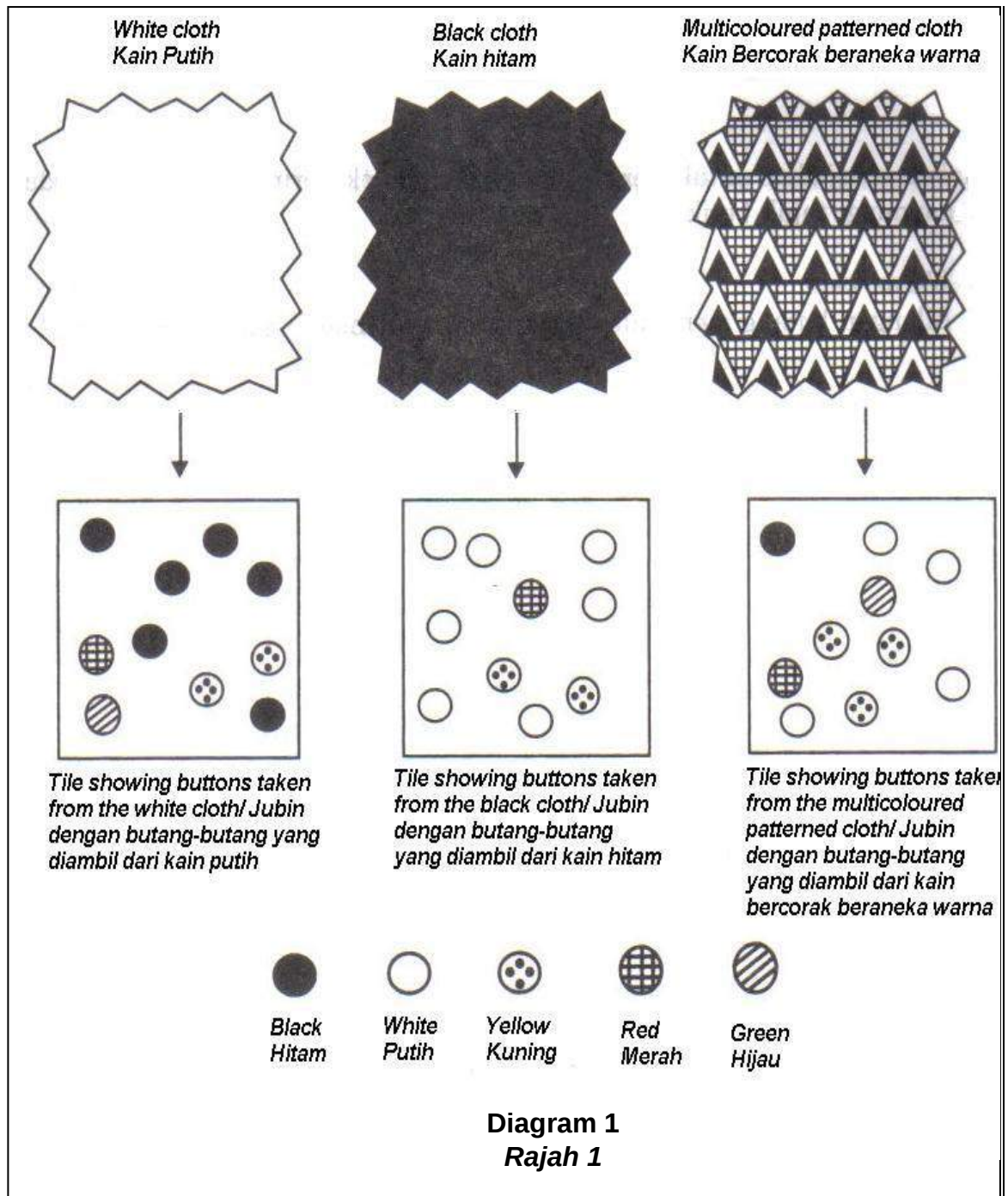
Step 4/ Langkah 4:

Steps 1 to 3 were repeated using a black cloth followed by a multicoloured patterned cloth.

Langkah 1 sehingga langkah 3 diulang untuk kain hitam dan kain bercorak beraneka warna.

Step 1 to step 4 are shown in Diagram 1.

Langkah 1 hingga langkah 4 ditunjukkan dalam Rajah 1.



(a)

Colour of cloth / Warna Kain	White cloth / Kain putih	Black cloth / Kain hitam	Multicoloured patterned cloth / Kain berwarna beraneka corak
Buttons/ Butang			
Most Number of buttons / Bilangan butang yang paling banyak			
Colour / Warna			

Table 1
Jadual 1

1 (a)

Record the most number of buttons taken from each different cloth and their colour in the boxes provided in Table1.

Rekod bilangan butang yang paling banyak diambil dari setiap kain yang berbeza dan warnanya dalam Jadual1.

[3 marks]

- (b) (i) State two observations from this experiment regarding the number of buttons of each color taken from the different cloth.

Nyatakan dua pemerhatian yang dapat dibuat berkenaan dengan bilangan butang mengikut warna yang diambil daripada kain-kain tersebut.

1.....

.....

2.....

.....

[3 marks]

- (ii) State one inference from each observation in (b)(i).

Nyatakan satu inferens bagi setiap pemerhatian di (b)(i).

Observation 1:

Pemerhatian1:

.....

.....

1(b)(i)

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Observation 2:
Pemerhatian 2:

.....

.....

[3 marks]

1(b)(ii)

☐

- (c) Construct a table to record the results of this experiment. Your table must have the following titles:

Binakan satu jadual untuk merekodkan keputusan eksperimen itu. Jadual anda hendaklah mengandungi tajuk berikut:

- Colour of cloth/ *warna kain*
- Number of buttons of each colour on the tile/ *Bilangan butang mengikut warna di atas jubin.*
- Total number of buttons taken / *Jumlah butang yang diambil*

1(c)

☐

[3 marks]

- (d) Complete Table 2 based on this experiment.

Lengkapkan Jadual 2 berdasarkan eksperimen ini.

Variable <i>Pembolehubah</i>	Method to handle the variable <i>Cara mengendali pembolehubah</i>
Manipulated variable <i>Pembolehubah dimanipulasi</i>	
Responding variable <i>Pembolehubah bergerak balas</i>	
Constant variable <i>Pembolehubah dimalarkan</i>	

Table 2
Jadual 2

[3 marks]

For
Examiner's
Use

1(d)

For
Examiner's
Use

- (e) State the hypothesis for this experiment.

Nyatakan hipotesis bagi eksperimen ini.

.....

.....

.....

[3 marks]

1(e)

- (f) State the relationship between the colour of the buttons taken and the colour of the cloth used.

Nyatakan hubungan antara pengambilan warna butang dengan warna kain.

.....

.....

.....

[3 marks]

1(f)

- (g) If the white cloth is replaced by a yellow cloth, predict which colour of the buttons would be taken by the student.
Explain your prediction.

Jika kain putih digantikan dengan kain kuning , ramalkan warna butang yang akan diambil dengan banyak.

Terangkan ramalan anda.

.....

.....

[3 marks]

1(g)

For
Examiner's
Use

- (h) This experiment illustrates a situation in a natural habitat. The white cloth represents an unpolluted tree. The black cloth represents a tree polluted with smog. The coloured buttons represent moths of various colours.

Eksperimen ini menggambarkan suatu keadaan di habitat semulajadi. Kain putih mewakili pokok yang tidak tercemar. Kain hitam mewakili pokok yang tercemar dengan asap kilang. Butang-butang berwarna mewakili kupu-kupu pelbagai warna.

State the change in number of brightly coloured moths on the smog-polluted tree with time. Explain your answer.

Nyatakan perubahan bilangan kupu-kupu berwarna cerah di pokok tercemar itu dengan masa. Terangkan jawapan anda.

.....

.....

.....

.....

[3 marks]

1(h)

- (i) Based on the results of the experiment, state the meaning of camouflage and its effects in a predator-prey relationship.

Berdasarkan keputusan eksperimen, nyatakan maksud penyamaran dan kesannya dalam hubungan mangsa-pemangsa.

.....

.....

.....

[3 marks]

1(i)

- (j) Another student investigates the use of camouflage in a predator-prey relationship by using the following specimens:
Seorang pelajar lain menjalankan kajian penyamaran mangsa-pemangsa dengan menggunakan specimen berikut:

Variegated leaf, red leaf, green leaf, green caterpillars and grey caterpillars.
Daun bervariegasi, daun berwarna merah, daun berwarna hijau, beluncas berwarna hijau dan beluncas berwarna kelabu.

Classify the above specimens based on their roles to camouflage in a natural environment.

Kelaskan spesimen di atas mengikut peranannya dalam penyamaran di persekitaran semulajadi.

For
Examiner's
Use

[3 marks]

1(j)

- 2 Enzyme is an organic compound found in the cells. It speeds up biochemical reactions in the cells. Some of the enzymes used in the school laboratory are amylase, pepsin and lipase.
Enzim adalah sebatian organik yang terdapat dalam sel. Ia mempercepatkan tindaklas biokimia di dalam sel. Antara enzim yang digunakan dalam makmel adalah amilase, pepsin dan lipase.

Enzyme's activity is influenced by temperature, pH, substrate concentration and enzyme concentration.
Aktiviti enzim dipengaruhi oleh suhu, pH, kepekatan substrat dan kepekatan enzim.

Based on the above information, design a laboratory experiment to investigate the effect of substrate concentration on the enzyme activity.
Berdasarkan maklumat di atas, reka bentuk satu eksperimen di makmal untuk mengkaji kesan kepekatan substrat ke atas aktiviti enzim.

The planning of your experiment must include the following aspects:
Perancangan eksperimen anda mesti mempunyai aspek-aspek berikut :

- Problem statement
Pernyataan masalah
- Aim of investigation
Objektif kajian
- Hypothesis
Hipotesis
- Variables
Pembolehubah
- List of apparatus and materials
Senarai radas dan bahan
- Technique used
Teknik yang digunakan
- Experimental procedure or method
Kaedah atau prosedur eksperimen
- Presentation of data
Cara data dipersembahkan
- Conclusion
Kesimpulan

[17 marks]

**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.
Marks awarded :

**END OF QUESTION PAPER
KERTAS SOALAN TAMAT**

KERTAS 1: BIOLOGI 1 (4551/1)
PEPERIKSAAN PERCUBAAN TAHUN 2008
[JABATAN PELAJARAN PAHANG]

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

Logo sekolah

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2008**

BIOLOGI

PERATURAN PERMARKAHAN

KERTAS 2

UNTUK KEGUNAAN PEMERIKSA SAHAJA

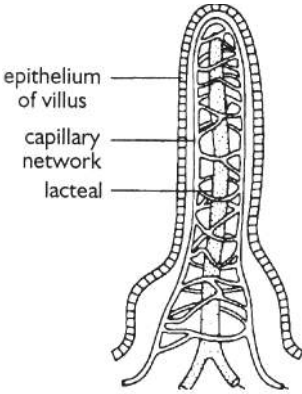
BIOLOGI

PERATURAN PERMARKAHAN

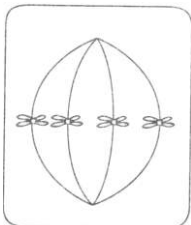
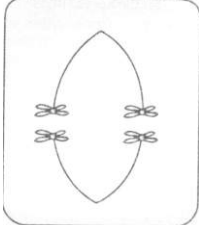
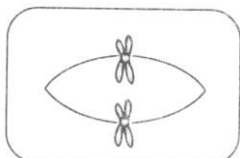
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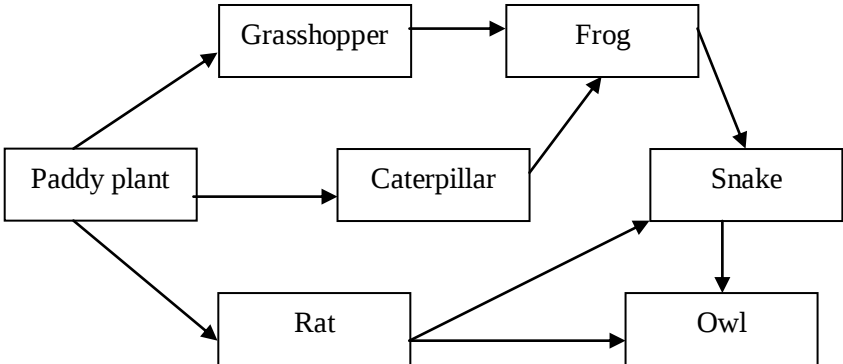
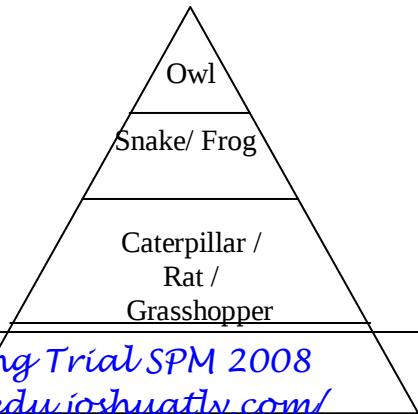
**TRIAL EXAM 2008
MARKING SCHEME**

No.	Marking Criteria	Mark	
1(a)(i)	Able to label the structures J, K and L correctly J – Vacuole K – cell wall L – cell membrane	1 1 1	3
(ii)	Able to state In which type of living organism are cells similar to the one shown in Diagram 1 normally found. Answer : Plants	1	1
(iii)	Able to state two reasons for choice of living organism in (ii). Sample answer R1 : Presence of cell wall R1 : Presence of large vacuole	1 1	2
(b)(i)	Able to name the process of the movement of substances across the plasma membrane as shown in Diagram 1(a) and Diagram 1(b) Answer : Osmosis	1	1
(ii)	Able to state type of solution A and B compared to the sap of the plant. Solution A : Hypotonic Solution B : Hypertonic	1 1	2
(c)	Able to explain what happens to the cell in Solution A as shown in Diagram 1(a). - State the presence of concentration gradient - State the direction of water movement - State the effect of water movement Sample answer : 1. Solution A is hypotonic to the cell sap // cell sap is hypertonic to Solution A 2. Water molecules move into the cell / plasma membrane through osmosis 3. The cell is turgid	1 1 1 max 2	2
(d)	Able to explain one method by which mango can be preserved for a		

	long period of time Sample answer : Method : Pickling Explanation : 1. Mango is immersed into the vinegar/ salt/ (concentrated) sugar solution 2. The concentrated sugar / salt solution is hypertonic to the mango/ cell sap // cell sap is hypotonic to the concentrated sugar/ salt 3. water will be drawn out of the mango through osmosis 4. this result in slower growth of the microorganisms / even death	1 1 1 1 1 max 2	Method and any two explanation 3
		TOTAL	13 marks
2(a)	Able to name the secretion which passes down tube W and state its function. Sampel answer : Secretion : Bile Function : Lipids / fats emulsifier / breaking lipids into tiny droplets	1 1	2
(b)	Able to draw and label the structure of vilus correctly :  epithelium of villus capillary network lacteal D – Able to draw the following parts • Blood capillary, epithelium, lacteal, finger-like projection L – Able to label any two parts • Blood capillary • Epithelium • lacteal	1 1	2
(c)(i)	Able to state the correct process Answer : Absorption / Diffusion / Active transport / Facilitated Diffusion	1	1
(c)(ii)	Able to state one characteristic correctly		

3(a)	Able to name the organelles labelled J and K and state its function correctly Answer : J : Mitochondria Function : to generate energy / sites of cellular respiration K : Ribosome Function : Site of enzyme / protein synthesis	1 1 1 1	4
(b)	Able to state what is represented by (i) the inflated balloons Answer : Substrate (ii) the fragments of burst balloon Answer : Products (of enzyme hydrolysis)	1 1	2
(c)	Able to state two characteristics of enzyme. 1. Enzyme reaction is specific 2. Enzyme does not change at the end of reaction Sample answer : Enzyme is not destroyed // does not change its shape 3. enzyme is protein 4. Enzyme is denatured at high temperatures 5. Enzyme is needed in small quantity 6. Reaction is reversible 7. Enzyme's rate of reaction is maximum at an optimum temperature	2	Any two
(d)(i)	Able to explain how enzymes are used in daily / industrial activities based on the following criteria : F – Enzyme and its substrate E – Its action Sample answer : To get rid of stains on cloth: F1- biological detergents contain proteases, amylases and lipases P1- proteases acts on stains containing proteins / blood / saliva P2- amylases acts on stains containing starch / sauces / ice cream/ gravy P3- lipases are effective in removing oil and grease Helping to cook meat: F2 – Protease acts on protein in meat P4 – tenderize / softens meat	1 1 2 1 1 2	F1 and any one P1/P2/P3 4
		TOTAL	12 marks
4(a)	Able to name P and Q correctly Answer : P : Centriole	1 1	2

4(b) 4(c) 4(d) 4(e) 4(f)	Q : Chromatid Able to state the type of nuclear division Answer : Cell A : Mitosis Cell B : Meiosis Able to state the stage of nuclear division Answer : Cell A : Anaphase Cell B : Anaphase II Able to describe the differences shown by Cell A and Cell B. F1 : In Cell A, sister chromatids separate and move to opposite poles of the cell. F2 : In Cell B, homologous chromosomes separate and move to opposite poles of the cell. Able to state significance When homologous chromosomes separate and move to opposites poles of Cell B, the chromosome number is halved. Able to draw three separate diagram    (i) (ii) (iii)	1 1 1 1 1 1 3 TOTAL	2 2 2 1 3 12 marks
5(a) 5(b)	Able to state the stimulated receptor Answer : Pain receptors Able to explain the arm react Answer : 1. The receptor receives nerve impluse 2. The nerve travels along the afferent	1 1 1	1

5(c)	3. And is transferred to the efferent neurone 4. At the axon terminal of the efferent neurone, the nerve impulse is transferred to muscle cell causing them to contract. 5. The arm bends and moves away from the hot object.	1 1 1	5
	Able to state the action controlled by the brain 1. Accommodation of the eye 2. Production of saliva	1 1	2
	5(d) Able to explain effects when X experience damage Loss of some touch sensations	1	1
	5(e) Able to explain why the brain not involved in controlling reflex action. F1 : The reflex arc is short F2 : Which allows effectors to respond fast to dangerous situations.	1 1	2
	TOTAL		11 marks
6(a)(i)	Able to construct a food web correctly <u>Criteria:</u> C1 Producer C2 Correct arrows C3 At least two food chains which are related C4 Must have all seven organisms Sample answer:  Able to construct a pyramid of numbers correctly <u>Criteria:</u> C1 4 trophic levels C2 Sequence and position of organisms in pyramid is correct Trophic level 1 Trophic level 2 Trophic level 3 	C4 + 3C = 2 C4 + 2C /1C = 1	2

	Trophic level 4 Paddy plant												
	<u>Note</u> : Staircase also accepted												
6(a)(ii)	Able to explain the control method correctly Sample answer: F1: Use insecticide/ pesticide P1: Kill/ destroy the pests/ grasshopper and caterpillar P2: Accumulation of chemical substances in the other organisms of the food chain causes mutation/ death of organisms// accumulation of chemical substances in the surroundings cause water/ air pollution/ effect of pollution. (Ex: ozone depletion) P3: The mutant pests develop resistance to the pesticide/ insecticide F2: Biological control method P4: Predator kills only the specific pests/ grasshopper and Caterpillar P5: Causing imbalanced population of other organisms in the community/ disruption of food change P6: Pests population decreases, producer/ paddy plants population Increases	1 1 1 1 1 1 1	F1 and any two P1, P2, P3 F2 and any two P4, P5, P6 6										
6(b)	Able to explain the good and bad effects correctly <table><tr><th>Good Effect (G)</th><th>Explanation (P)</th></tr><tr><td>G1: Provides job opportunity</td><td>P1: Improve economic status</td></tr><tr><td>G2: Provides infrastructure basic needs</td><td>P2: Build up schools/ clinics to upgrade quality/ better opportunity in education</td></tr><tr><td>G3: Provides better living condition/ convenient place for settlement</td><td>P3: Have good sanitation system/ hygienic water supply/ better electric supply</td></tr><tr><td>G4: Convenient transport system</td><td>P4: Faster transportation/ save time to move from one place to another</td></tr></table> - Independent G and P (Any 5)	Good Effect (G)	Explanation (P)	G1: Provides job opportunity	P1: Improve economic status	G2: Provides infrastructure basic needs	P2: Build up schools/ clinics to upgrade quality/ better opportunity in education	G3: Provides better living condition/ convenient place for settlement	P3: Have good sanitation system/ hygienic water supply/ better electric supply	G4: Convenient transport system	P4: Faster transportation/ save time to move from one place to another		max 5
Good Effect (G)	Explanation (P)												
G1: Provides job opportunity	P1: Improve economic status												
G2: Provides infrastructure basic needs	P2: Build up schools/ clinics to upgrade quality/ better opportunity in education												
G3: Provides better living condition/ convenient place for settlement	P3: Have good sanitation system/ hygienic water supply/ better electric supply												
G4: Convenient transport system	P4: Faster transportation/ save time to move from one place to another												

	Bad Effect (B)	Explanation (P)		max 5
	B1: Area/ paddy field exposed to land reclamation	P5: During heavy rain, soil particles are washed away to the river/ water source leads to muddy flood/ leaching		
	B2: Habitat for flora/ fauna/ paddy field are destroyed	P6: Extinction of flora/ fauna in the area// less agricultural productivity in the area		
	B3: Air/ water/ thermal/ sound pollution	P7: Due to the release of pollutants into the environments// causes diseases/ bronchitis/ asthmatic/ stress// leads to decrease in health quality		
	B4: Increase population in the area	P8: Leads to social problems		
Independent B and P <				

[illegible]

	E8 : Surface for gaseous exchange is outside the body since fish lives in water Surface for gaseous exchange is inside the body to avoid dehydration	max 10	10
		TOTAL	20 marks
8(a)	Able to explain how contraceptive pills react with negative feedback mechanism to prevent pregnancy. P1 – Contraceptive pills contain (a combination of low) oestrogen and (high) progesterone hormone P2 – the pills should be taken between any day from the 1st -5th day of the menstrual cycle, for a duration of 21 days P3 – Oestrogen promotes/causes repair / growth of the endometrium (in preparation for implantation) P4- Progesterone maintain the thickness of uterus lining P5 – High level of progesterone inhibit the pituitary's production P6- no secretion of FSH / follicle-stimulating hormone P7 – no follicle develops in the ovary P8 – no Graafian follicle P9 – less / no secretion of LH by the pituitary gland P10 – Ovulation is low / does not occur P11 – no fertilisation occur	1 1 1 1 1 1 1 1 1 1 1	max 10
(b)(i)	Able to describe briefly what <i>in vitro</i> fertilization (IVF) is. P1 - Woman is injected with FSH hormone P2 - stimulates growth / developments of follicle in the ovary P3 – (A laparoscope is inserted at the navel to) collect immature ova /ovum from the ovaries // the immature ova/ovum are harvested from the ovaries P4 - then, the ova are placed in (glassware with) culture solution to mature P5 – Sperms are collected and placed in the culture solution . Fertilisation occurs. // the ova then, fertilised with the sperm P6 – leave it within 2 days (48 hours) to enable the zygote to develops/ divide themselves into eight cells P7 – the zygote / embryos are placed into the woman/mother uterus (by using a catheter) P8 – the embryos/zygotes are allowed to develop in her uterus until birth	1 1 1 1 1 1 1 1 1	8

(b)(ii)	Able to explain some moral issues related to IVF. M1 – Storage techniques used in IVF produces more than one zygote. What will happen to this zygote M2 – If the uterus of the mother is not strong/ healthy, who is going to accept the zygote? What is the relationship between zygote/child with the surrogate mother M3 – If the husband is infertile, who is going to donate the sperm? What is the relationship between zygote/child with the father M4 – Unmarried women can have their <u>own</u> children / can get pregnant M5 – Tendency of choosing the children gender M6 – There were cases where the surrogate mother develop emotional ties and refuse to be separated from their babies REJECT – RELIGIOUS ORDERS	1 1 1 1 1 1 TOTAL	max 2 20 marks
9(a)	Able to explain why (i) there should be an equal chance of a baby being either a boy or a girl F1 –Sex chromosomes of a female is XX and male sex chromosomes is XY F2 – (During the production of gametes), the male produces sperms containing either the X or the Y chromosome (in equal quantities) F3 - (During the production of gametes), the female produces ovum with X chromosome F4 – During fertilization, the female gamete can either fuse with an X-chromosome / Y-chromosome sperm (ii) in some families, all children are of the same sex F5 – In every pregnancy, there is a 50% chance of having either a boy or a girl F6 – the children of the family are all of the females because at each event of fertilization, the X-chromosome sperm fuse with the X-chromosome ovum // all males because at each event of fertilization, the Y-chromosome sperm fuse with the X-chromosome ovum	1 1 1 1 1 1	F1 and any two F2, F3, F4 5 m
(b)	Able to state the following points P1 – Genotypes of parents P2 – Formation of gametes by having one of the genes from the parent cell P3 – Separation of genes during meiosis P4 – Random fertilization between gametes P5– genotypes of offspring's P6 – phenotypes of offspring Sample answer : Parent Curly-haired Heterozygous Genotype Meiosis Gamete Fertilization Hz √P3 H h Straight-haired homozygous Genotype Meiosis Gamete Fertilization he √P3 h h Diagram showing the formation of gametes and fertilization: Parent 1 (Curly-haired, Heterozygous, Hz) produces gametes H and h (√P3). Parent 2 (Straight-haired, homozygous, he) produces gametes h and h (√P3). Fertilization (√P4) results in offspring genotypes: Hh, Hh, Hh, Hh.	1 1 1 1 1 1 max 5	5 m

(c)	Offspring				
	Genotype	Hh	Hh	√P5	hh
	Phenotype	curly hair			straight hair
	Phenotype ratio	1	:		1
	Genotype ratio	1	:		1
	Keys :	H – dominant			
		h - recessive			
	Able to identify the physical characteristics in each family member				
	1. Type of tail				1X3 =3
	2. (Coat) colour				1X3 =3
	3. Type of whiskers				1X3 =3
					max 6
	State the cause of genetic variation				
	C1- Phenotypes are displayed based on dominant alleles				1
	C2- During gamete formation in sexual reproduction				1
	C3- Crossing over occurs during meiosis 1 between pairs of homologous chromosomes.				1
	C4- fertilization between gametes occur				1
	C5- Recombinations of chromosomes to produce offspring				1
					max 4
	Sample answer :				
	1. Female mouse /A has short tail				
	Male mouse / B has long tail				
	Mouse C has long tail				
	2. Female mouse / A has grey/black (coat) colour				
	Male mouse / B has white (coat) colour				
	Mouse C has grey/black (coat) colour				
	3. Female mouse / A has short whiskers				
	Male mouse / B has long whiskers				
	Mouse C has long whiskers				
	Able to explain each cause of variation correctly.				
	<u>Explanation 1 :</u>				
	-Offspring display phenotypes based on dominant alleles				
	<u>Explanation 2 :</u>				
	-Gametogenesis is the production of gametes in sexual reproduction				
	<u>Explanation 3:</u>				
	-Crossing-over during meiosis 1 between pairs of homologous chromosomes.				
	-Arrangement of homologous chromosomes during metaphase 1 occurs randomly				
	-Total number of haploid chromosomes / n= 23 causes vast number of recombinations of chromosomes in gametes.				
	<u>Explanation 4:</u>				
	-Fertilisation between gametes occurs randomly				
	-The number of combinations between the ovum and any one sperm is				

	very great <u>Explanation 5:</u> - Recombinations of chromosomes resulting in the production of an offspring with various characteristics	TOTAL	
			20 marks

Peperiksaan Percubaan Tingkatan 5
Jawapan Kertas 3
Biologi 4551/3

Question 1

1 (a) KB0603 – Measuring Using Numbers

Score	Criteria																
3	Able to record all 3 number of buttons and 3 colours correctly.																
	<table><tr><td>Colour of cloth / Warna Kain</td><td>White cloth / Kain putih</td><td>Black cloth / Kain hitam</td><td>Multicoloured patterned cloth / Kain berwarna beraneka corak</td></tr><tr><td>Buttons/ Butang</td><td></td><td></td><td></td></tr><tr><td>Most Number of buttons / Bilangan butang yang paling banyak</td><td>6</td><td>7</td><td>4</td></tr><tr><td>Colour / Warna</td><td>Black</td><td>White</td><td>White</td></tr></table>	Colour of cloth / Warna Kain	White cloth / Kain putih	Black cloth / Kain hitam	Multicoloured patterned cloth / Kain berwarna beraneka corak	Buttons/ Butang				Most Number of buttons / Bilangan butang yang paling banyak	6	7	4	Colour / Warna	Black	White	White
	Colour of cloth / Warna Kain	White cloth / Kain putih	Black cloth / Kain hitam	Multicoloured patterned cloth / Kain berwarna beraneka corak													
	Buttons/ Butang																
Most Number of buttons / Bilangan butang yang paling banyak	6	7	4														
Colour / Warna	Black	White	White														
2	Able to record any 2 number of buttons and 2 colours correctly.																
1	Able to record any 1 number of buttons and 1 colour correctly																
0	No response or one reading only																

1 (b) (i) [KB0601 - Observation]

Score	Criteria
3	Able to state any two observations correctly according to the criteria: - o Type/ colour of cloth - o Number of buttons - o The colour of buttons Sample answers: 1. For the white cloth, 6 black buttons, 2 yellow, 1 green, 1 red are taken . 2. The most // least number of buttons taken from black cloth are white buttons // red buttons. 3. The number of buttons taken from multicoloured patterned cloth are 4 white, 3 yellow, 1 black, 1 green and 1 red.
2	Able to state any one observation correctly. or Able to state any two incomplete observations (any 2 criteria)

	Sample answers: 1. Buttons taken from white cloth are black,yellow,green,red in colour. 2. Buttons taken from multicoloured patterned cloth are white, black,yellow,green,red in colour.
1	Able to state any one idea of observation.(any 1criteria) Sample answers: 1. The number of buttons taken depends on the type of cloth used. 2. The number of buttons taken from white cloth shows different colours.
0	No response <i>or</i> wrong response.

1 (b) (ii) [KB0604 - Making inferences]

Score	Criteria
3	Able to make one inference for each observation based on the criteria o Type of cloth o Colour of buttons Sample answers: 1. Difference in colour between white cloth and black buttons are very distinct / clear 2. Difference in colour between black cloth and white buttons are very distinct / clear 3. Difference in colour between multicoloured patterned cloth and all the buttons are not distinct / clear.
2	Able to make one inference for any one observation. <i>or</i> Able to make one and incomplete inference Sample answer: for each observation. Sample answer: 1. Because the colour of buttons more visible on white /black / multicoloured patterned cloth .
1	Able to make an idea of inference with one criterion. Sample answers 1. Different type of cloth affect the number of buttons taken
0	No response <i>or</i> wrong response.

1(c) [KB0606 – Communicating]

Score	Criteria																																			
3	Able to construct a table by using the criteria given T : State all the three aspects correctly D : State all data for number of buttons K : State the total number of buttons taken Sample answers <table><tr><th> Colour of buttons Colour of cloth </th><th colspan="5">Number of button taken</th><th>Total number of buttons taken</th></tr><tr><th></th><th>Black</th><th>White</th><th>Yellow</th><th>Red</th><th>Green</th><th></th></tr><tr><td>White</td><td>6</td><td>0</td><td>2</td><td>1</td><td>1</td><td>10</td></tr><tr><td>Black</td><td>0</td><td>7</td><td>2</td><td>1</td><td>0</td><td>10</td></tr><tr><td>Multicoloured patterned</td><td>1</td><td>4</td><td>3</td><td>1</td><td>1</td><td>10</td></tr></table>	Colour of buttons Colour of cloth	Number of button taken					Total number of buttons taken		Black	White	Yellow	Red	Green		White	6	0	2	1	1	10	Black	0	7	2	1	0	10	Multicoloured patterned	1	4	3	1	1	10
Colour of buttons Colour of cloth	Number of button taken					Total number of buttons taken																														
	Black	White	Yellow	Red	Green																															
White	6	0	2	1	1	10																														
Black	0	7	2	1	0	10																														
Multicoloured patterned	1	4	3	1	1	10																														
2	Able to record two criterias correctly																																			
1	Able to record one criteria correctly																																			
0	No response or wrong response.																																			

1(d) [KB0610–Variables]

3	Able to state all 3 variables and the 3 methods to handle the variable correctly. Sample Answer : <table border="1"> <tr> <th>Variables</th><th>Method to handle the variable correctly</th></tr> <tr> <td> <u>Manipulated variable</u> The colour of cloth </td><td>By using different colour of cloth</td></tr> <tr> <td> <u>Responding variable</u> Number of buttons taken according to the colour </td><td>Count and record the number of buttons for each colour taken // count the number of coloured buttons (if data is correct)</td></tr> <tr> <td> <u>Constant variable</u> The size of cloth </td><td>Used 50cm x 50cm cloth</td></tr> </table> 6 ticks	Variables	Method to handle the variable correctly	<u>Manipulated variable</u> The colour of cloth	By using different colour of cloth	<u>Responding variable</u> Number of buttons taken according to the colour	Count and record the number of buttons for each colour taken // count the number of coloured buttons (if data is correct)	<u>Constant variable</u> The size of cloth	Used 50cm x 50cm cloth
Variables	Method to handle the variable correctly								
<u>Manipulated variable</u> The colour of cloth	By using different colour of cloth								
<u>Responding variable</u> Number of buttons taken according to the colour	Count and record the number of buttons for each colour taken // count the number of coloured buttons (if data is correct)								
<u>Constant variable</u> The size of cloth	Used 50cm x 50cm cloth								
2	4 - 5 ticks correctly. ▪ Reject way how to handle variable if variable is wrong.								
1	Able to state 2-3 ticks correctly								

0	No response or only one aspect correct.

1(e) [KB0611- Making Hypothesis]

Score	Criteria
3	Able to state a hypothesis to show a relationship between the manipulated variable and responding variable and the hypothesis can be validated, base on 3 criteria: • manipulated variable • responding variable • relationship Sample answer : 1. If the colour of cloth and the colour of buttons are obviously different, so more buttons are taken // identified
2	Able to state a hypothesis relating the manipulated variable and responding variable inaccurately with two criteria correctly Sample answer: 1. When there are difference between colour of cloth and colour of buttons the number of coloured buttons taken is different.
1	Able to state a hypothesis relating the manipulated variable at idea level, with one criteria correctly Sample answer: 1. Different colour of cloth influenced the number of buttons taken.
0	Not able to response or wrong response.

1(f) [KB0608 – Interpreting Data]

Score	Criteria
3	Able to state clearly and accurately the relationship between the colour of buttons taken and the colour of cloth used base on three criterias : K1 : showing relationship between colour of buttons taken and the colour of cloth used. K2 : correct relationship for different / contrast colour of cloth and colour of buttons K3 : correct relation for the same colour of cloth and colour of buttons Sample answer: 1. White cloth-more black buttons and no white buttons are taken
2	Able to state clearly but less accurate the relationship between the colour of buttons taken and the colour of cloth used base on two criterias K1 and K2 or K3 Sample answer :

	White cloth -more black buttons are taken // less / no white button taken.
1	Able to state the idea of the relationship buttons taken and the colour of cloth used base on one criteria Sample answer : More buttons for white cloth.
0	Not able to response <i>or</i> wrong response.

1(g) [KB0605 – Predicting]

Score	Criteria
3	Able to predict the result accurately. Relationship : P1 = Able to state the <u>buttons taken more</u> P2 = Able to <u>compare</u> P3 = Able to state <u>the reason</u> Sample answer: 1. The black buttons / black and green / black and red /black,green and red are taken more compare to yellow / white because these buttons are seen clearer on the yellow cloth.
2	Able to predict the result less accurate base on two criterias: Sample answer : 1. Red buttons/green buttons taken because they are seen clearer.
1	Able to give idea of the result base on one criterion Sample answer : 1. All coloured buttons are taken.
0	Not able to response <i>or</i> wrong response.

1(h) [KB06012 – Space and Time Relationship]

Score	Criteria
3	Able to explain correctly the relation between brightly coloured moths on the smog-polluted tree with time. Relationship : P1 = Able to state the <u>relationship between brightly coloured moths on the smog-polluted tree with time.</u> Explanation P2 = Able to state <u>colour of the bark</u> P3 = Able to state <u>the effect on the brightly coloured moths</u> Sample answer: 1. The number of moths will decrease with time.The colour of bark will become darker so the moths with brightly coloured will be seen clearly to its predator.

2	Able to explain incorrectly the relation between brightly coloured moths on the smog-polluted tree with time base on two criteria. P1 and P2 or P3 Sample answer: 1. The number of moths will decrease with time. The colour of bark will become darker // the moths with brightly coloured will be seen clearly to its predator.
1	Able to state the relation between brightly coloured moths on the smog-polluted tree with time base at idea level base one criteria. Sample answer : 1. The number of moths will decrease with time
0	Not able to response or wrong response.

1(i) [KB0609 –Defining by Operation]

Score	Criteria
3	Able to state correctly the meaning of camouflage and its effects in a predator-prey relationship base on three criterias : C1 : Ways of adaptation C2 : Effect of adaptation / camouflage C3 : Reason Sample answer: -Ability of the animal to change its body colour as the environment -not easily seen (by predators) - to avoid being victimised.
2	Able to state the meaning of camouflage teoritically or as a concept base on two criterias : C1 and C2 // C1 and C3 // C2 and C3
1	Able to state the idea base on one criteria Sample answer: Ability of the animal to camouflage to avoid being victimised.
0	Not able to response or wrong response.

1(j) [KB0602 – Classifying]

Score	Criteria
3	Able to classify corectly the specimens based on their roles to camouflage in a natural environment.

	Sample answer: <table border="1"> <tr> <th>Environment</th><th>Prey</th></tr> <tr> <td>Variegated leaf</td><td>Green caterpillars</td></tr> <tr> <td>Red leaf</td><td>Grey caterpillars</td></tr> <tr> <td>Green leaf</td><td></td></tr> </table>	Environment	Prey	Variegated leaf	Green caterpillars	Red leaf	Grey caterpillars	Green leaf	
Environment	Prey								
Variegated leaf	Green caterpillars								
Red leaf	Grey caterpillars								
Green leaf									
2	Able to classify the specimens based on their roles to camouflage in a natural environment. Sample answer: <table border="1"> <tr> <th>Environment</th><th>Organism</th></tr> <tr> <td>Variegated leaf</td><td>Green caterpillars</td></tr> <tr> <td>Red leaf</td><td>Grey caterpillars</td></tr> <tr> <td>Green leaf</td><td></td></tr> </table>	Environment	Organism	Variegated leaf	Green caterpillars	Red leaf	Grey caterpillars	Green leaf	
Environment	Organism								
Variegated leaf	Green caterpillars								
Red leaf	Grey caterpillars								
Green leaf									
1	Able to collect information without classes Sample answer: <table border="1"> <tr> <td>Variegated leaf</td><td>Green caterpillars</td></tr> <tr> <td>Red leaf</td><td>Grey caterpillars</td></tr> <tr> <td>Green leaf</td><td></td></tr> </table>	Variegated leaf	Green caterpillars	Red leaf	Grey caterpillars	Green leaf			
Variegated leaf	Green caterpillars								
Red leaf	Grey caterpillars								
Green leaf									
0	Not able to response or wrong response.								

Question 2

KB061201 – (Problem statement)

Score	Criteria
3	Able to state the problem statement correctly : C1 : Manipulated Variable C2 : Responding variable R : Question form and have relationship Sample Answer : 1. What is the effect of starch / substrate concentration on the rate of amylase reaction / activity ? 2. How starch / substrate concentration affects the rate of amylase reaction / activity ? # Without question mark (?) – score 2
2	Able to give a statement of identified problem but incomplete. Sample Answer: 1. What is the effect of starch / substrate concentration on amylase? 2. How does starch affect the rate of reaction / activity of amylase?
1	Able to give idea of a statement of identified problem. Sample Answer: 1. What is the starch / substrate concentration? 2. Starch / substrate concentration affects amylase.
0	No response or wrong response

KB061202(Making Hypothesis)

Score	Criteria
3	Able to state the hypothesis correctly by relating two variables. Criteria set: C1 : State the manipulated variable C2 : State the responding variable R : Show the specific relationship and direction between the manipulated variable and the responding variable. Answer must have C1, C2 and R Sample Answer : 1. The rate of amylase / enzyme reaction /activity increases with the increase in starch / substrate concentration (until it reaches a

	maximum rate). 2. As the concentration of amylase / enzyme increases the time taken for the hydrolysis of starch to be completed increases.
2	Able to make a statement of hypothesis which relates the manipulated variable to the responding variable. Answer must have C1 and C2 but without correct relationship Sample Answer : 1. Starch / Substrate concentration increases the rate of amylase / enzyme reaction / activity. 2. Starch / Substrate concentration affects the rate of amylase / enzyme reaction / activity.
1	Able to state an idea of a statement of hypothesis. Sample Answer: 1. The rate of amylase / enzyme reaction / activity increases.
0	No response or wrong response

KB061203 - Planning (Planning for investigation)

Score	Criteria
3	Scoring Criteria: Able to state 7-9 planning investigation of experiment following: • Problem statement (PS) – idea • Aim of investigation / Objective (Ob) – Relation between C1 and C2 Sample answer 1. To investigate the effect of starch / substrate concentration on the rate of amylase / enzyme reaction / activity. • Statement of hypothesis (Hp) – idea • States variables – (Vr) All three variables must be correct : Manipulated variable : Concentration of starch suspension / substrate Responding Variable : Time taken for the hydrolysis of starch to be completed / the mixture stops turning blue black in colour when tested with iodine solution // rate of salivary amylase / enzyme reaction / activity Constant Variable : Amylase / Enzyme concentration // temperature

	List of materials and apparatus (AM) • Technique (Tq) – Correctly and accurately (Bonus 1) = 1 mark Sample Answer: Record the time taken for the hydrolysis of starch to be completed / the mixture stops turning blue black in colour when tested with iodine solution by using a stop clock.// Calculate and record the rate of enzyme activity using formula : $\frac{1}{\text{Time}} \text{ minute}^{-1}$ • Procedure / Method of investigation (K)– must have at least one criteria either K1 @ K2 @ K3 @ K4 @ K5 • Data presentation // presentation of result (RD) – Have table with 3 titles with correct units and no data is required • Sample Answer : <table><tr><th>Concentration of starch (%)</th><th>Time taken the hydrolysis of starch to be completed (min)</th><th>Rate of enzyme reaction = $\frac{1}{\text{Time}}$ (minute⁻¹)</th></tr><tr><td>0.1</td><td></td><td></td></tr><tr><td>0.2</td><td></td><td></td></tr><tr><td>0.3</td><td></td><td></td></tr><tr><td>0.4</td><td></td><td></td></tr><tr><td>0.5</td><td></td><td></td></tr><tr><td>0.6</td><td></td><td></td></tr></table> Second Bonus : 1 mark • Conclusion (Cn) – Must be the same with hypothesis. If hypothesis is wrong, <i>reject</i> conclusion. Sample answer : The rate of amylase / enzyme reaction / activity increases with the increase in starch / substrate concentration (until it reaches a maximum rate). (Hypothesis is accepted) *** If students only write hypothesis accepted in conclusion , reject conclusion.	Concentration of starch (%)	Time taken the hydrolysis of starch to be completed (min)	Rate of enzyme reaction = $\frac{1}{\text{Time}}$ (minute ⁻¹)	0.1			0.2			0.3			0.4			0.5			0.6		
Concentration of starch (%)	Time taken the hydrolysis of starch to be completed (min)	Rate of enzyme reaction = $\frac{1}{\text{Time}}$ (minute ⁻¹)																				
0.1																						
0.2																						
0.3																						
0.4																						
0.5																						
0.6																						
2	Scoring Criteria : State 4 - 6 items																					
1	Scoring Criteria: State 1 - 3 items																					

0	No response or wrong response

KB061204 (Method / procedure of investigation)

Score	Criteria
3	Able to state all five criteria P1, P2, P3, P4 and P5 : Criteria : K1 : Preparation of materials & apparatus (any 4) - Six test tubes are labelled A to F - Drops of iodine solution are added separately onto the grooves of a white tile using a syringe - Stopwatch is activated immediately (0 minute). - The contents are stirred with a glass rod. - A drop of mixture is tested with iodine solution on the white tile - Steps 4-9 are repeated with test tubes B,C,D,E and F. - Plot a graph K2 : Operating Fixed variable (any 1) - volume of amylase solution - volume of starch suspension - temperature for experiment at 37°C K3 : Operating responding variable Record the time taken for the hydrolysis of starch to be completed / the mixture stops turning blue black in colour when tested with iodine solution . K4 : Operating manipulated variable - Repeat experiment in different concentrations of starch suspension such as 0.1% , 0.2% ,0.3% , 0.4% , 0.5% , 0.6% K5 : Precaution / Accuracy of experiment (Any 1) - Using different syringes - At every sampling the dropper must be rinsed with clean distilled water. - The step is repeated at 30 second intervals until the mixture stops turning blue black in colour when tested with iodine solution. Sample Answer: : 1. Six test tubes are labelled A to F 2. 5 ml of starch suspensions of different concentrations are poured into the following test tubes using different syringes. A : 0.1% of starch suspension B : 0.2% of starch suspension

Skor	Perkara												
3	Able to state all the materials and apparatus: Sample Answer: Materials : <table border="0"> <tr> <td>Amylase solution*</td><td>Iodine solution*</td></tr> <tr> <td>Starch suspensions at different concentrations</td><td>Distilled water</td></tr> <tr> <td>0.1%,0.2%,0.3%,0.4%,0.5%,0.6%*</td><td>//</td></tr> </table> Apparatus : <table border="0"> <tr> <td>Test tubes /beakers*</td><td>Glass rods</td></tr> <tr> <td>Stop clock*</td><td>White tile (with groove)</td></tr> <tr> <td>Syringes</td><td>Droppers</td></tr> </table> Remarks:	Amylase solution*	Iodine solution*	Starch suspensions at different concentrations	Distilled water	0.1%,0.2%,0.3%,0.4%,0.5%,0.6%*	//	Test tubes /beakers*	Glass rods	Stop clock*	White tile (with groove)	Syringes	Droppers
Amylase solution*	Iodine solution*												
Starch suspensions at different concentrations	Distilled water												
0.1%,0.2%,0.3%,0.4%,0.5%,0.6%*	//												
Test tubes /beakers*	Glass rods												
Stop clock*	White tile (with groove)												
Syringes	Droppers												
2	Able to state three of the * materials and three * apparatus including												

	syringes
1	Able to state three of the * materials and two *apparatus including
0	No response or wrong response

Mark:

3 X 5 = 15 marks

B1 = 1 mark(technique)

B2 = 1 mark(Data presentation)

TOTAL = 17 marks

END OF MARKNG SCHEME