SULIT
4551/1
Biologi
Kertas 1
Ogos/Sept 2013
1 1/4 jam

PENTAKSIRAN SUMATIF 3
SIJIL PELAJARAN MALAYSIA 2013

BIOLOGI
Kertas 1
Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini mengandungi 50 soalan.*
2. *Kertas soalan ini disediakan dalam dwibahasa.*
3. *Jawab semua soalan.*
4. *Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan yang disediakan.*
5. *Sekiranya anda hendak menukarkan jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*
6. *Rajah yang mengiringi soalan dimaksudkan untuk memberi maklumat yang berguna bagi menjawab soalan. Rajah tidak dilukis mengikut skala kecuali dinyatakan.*
7. *Anda dibenarkan menggunakan kalkulatur saintifik yang tidak boleh diprogram.*

Kertas soalan ini mengandungi 24 halaman bercetak.

TERENGGANU NEGERI ANJUNG ILMU

Dibiayai oleh:
Kerajaan Negeri Terengganu

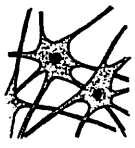
Dicetak Oleh:
Percetakan Yayasan Islam Terengganu Sdn. Bhd.
Tel: 609-666 8611/6652/8601 Faks: 609-666 0611/0063

1. Which of the following tissues is not a connective tissue?
Antara sel berikut, yang manakah bukan tisu penghubung?

A Epithelial / *epitelium*
B Ligament / *ligamen*
C Tendon / *tendon*
D Blood / *darah*

2. Which of the following cells involved in human immunity system?
Antara sel berikut yang manakah terlibat dalam sistem keimunan dalam manusia?

A



B

C

D

3. Diagram 1 shows the cell organisation in multicellular organism.
Rajah 1 menunjukkan organisasi sel dalam organisma multisel.

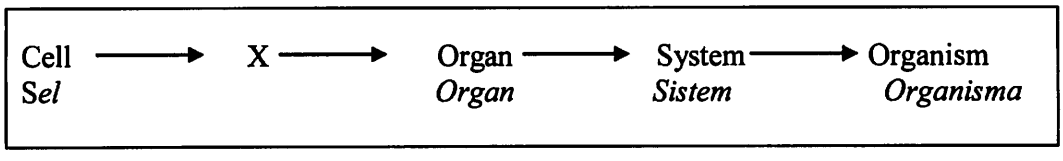


Diagram 1

Which part of the body can be represented by X?
Apakah bahagian badan yang boleh diwakili oleh R?

A Ligament / *ligament*
B Heart / *jantung*
C Epithelium / *Epitelium*
D Skin / *kulit*

4. Diagram 2 shows a cell which has been put into a particular solution.
Rajah 2 menunjukkan sel yang telah dimasukkan ke dalam larutan tertentu.

Diagram 2

Which is experienced by the cell?
Apakah yang dialami oleh sel itu?

A Crenation / *krenasi*
B Plasmolysis / *plasmolisis*
C Deplasmolysis / *deplasmolisis*
D Haemolysis / *hemolisis*

5 Diagram 3 shows the shape of a stalk of mustard green when put in certain type of solution
Rajah 3 menunjukkan bentuk batang sawi yang diletakkan dalam jenis larutan tertentu.

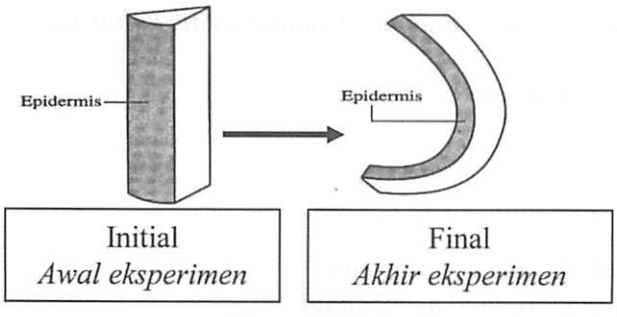


Diagram 3

Which of the following is the correct type of solution?
Antara berikut yang manakah merupakan jenis larutan yang betul?

A Hypertonic / *hypertonik*
B Isotonic / *isotonik*
C Hypotonic / *hipotonik*
D Supertonic / *Supertonik*

6. Which of the following carbohydrates is a polysaccharide?
Antara karbohidrat berikut, yang manakah merupakan polisakarida?

A Maltose / *Maltosa*
B Fructose / *Fruktosa*
C Glucose / *Glukosa*
D Glycogen /*Glikogen*

7 Diagram 4 shows the action of an enzyme maltase .
Rajah menunjukkan tindakan enzim maltase.

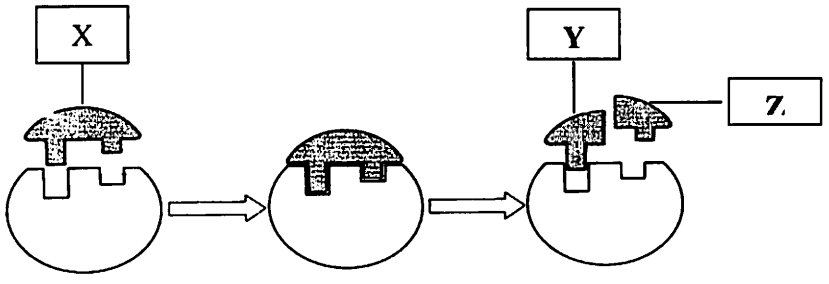


Diagram 4

X, Y and Z represent
X, Y dan Z mewakili

	X	Y	Z
A	Maltose /*maltosa*	Glucose /*glukosa*	Fructose / *fruktosa*
B	Maltose / *maltosa*	Glucose / *glukosa*	Glucose / *glukosa*
C	Maltose / *maltosa*	Glucose / *glukosa*	Galakt*ose / galaktosa*
D	Maltose / *maltosa*	Galaktose / *galaktosa*	Fructose / *fruktosa*

8. Which process is used in tissue culture technique?
Antara proses berikut yang manakah digunakan dalam teknik kultur tisu?

A. Fertilisation / *Persenyawaan*
B. Synthesis / *Sintesis*
C. Meiosis / *Meiosis*
D. Mitosis / *Mitosis*

9. Diagram 5 shows a cell undergoing cell division.
Rajah 5 menunjukkan sel yang sedang membahagi.

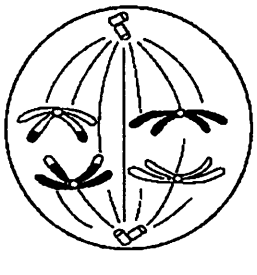


Diagram 5

Which of the following is the product of cell division shown in diagram 5.
Yang manakah antara berikut merupakan hasil pembahagian sel yang ditunjukkan dalam rajah 5.

A. Testis / *Testis*
B. Spermatogonium / *Spermatogonium*
C. Ovary / *Ovari*
D. Secondary oocyte / Oosit sekunder

10. Table 1 shows the result of food test on food sample X and Y.
Jadual 1 menunjukkan keputusan ujian makanan ke atas sampel makanan X dan Y

Food sample/ Sampel makanan	Observation/Pemerhatian
X	Brick red precipitate formed after being heated with Benedict solution. *Mendakan merah bata terbentuk selepas dipanaskan dengan larutan Benedict.*
	Brown solution occur when being mixed with iodine solution *Larutan berwarna perang wujud selepas ditambah larutan iodin.*
Y	Red precipitate formed after being heated with Millon reagent *Mendakan merah terbentuk selepas dipanaskan dengan bahanuji Millon.*
	Bleached the blue colour of DCPIP *Melunturkan warna biru DCPIP*

Table 1

Which of the following is the correct food contents in X and Y?
Yang manakah antara berikut merupakan kandungan makanan yang betul dalam X and Y?

	X	**Y**
A	Sugar and starch/*gula dan kanji*	Protein and starch/*protein dan kanji*
B	Sugar and starch/*gula dan kanji*	Protein and lipid/*protein dan lipid*
C	Sugar/*gula*	Protein and vitamin C/*protein dan vitamin C*
D	Sugar/*gula*	Protein and vitamin D/*protein dan vitamin D*

11. Diagram 6 shows the digestive system in human.
Rajah 6 menunjukkan sistem pencernaan manusia.

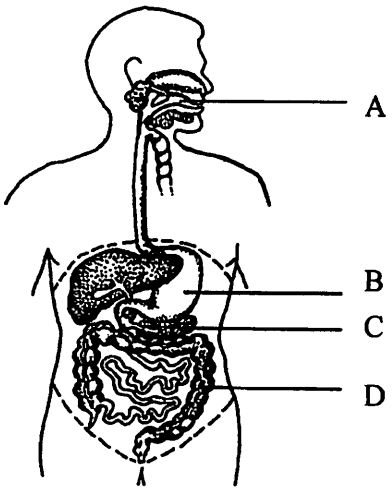


Diagram 6

Which of the label parts A, B, C and D is the first part where protein is digested.
Bahagian berlabel yang manakah merupakan tempat pertama berlakunya pencernaan ke atas protein.

12. Which of the following is an effect of vitamin deficiency?
Antara yang berikut, yang manakah kesan kekurangan vitamin?

A Anemia / *anemia*
B Muscular dystrophy / *distrofi otot*
C Colour blindness / *buta warna*
D Ricket /*riket*

13. Which of the following is the function of bile in digestive system?
Antara yang berikut, yang manakah fungsi hempedu dalam sistem pencernaan?

A Breakdown protein into small droplet/*memecahkan protein kepada titisan kecil*
B Breakdown lipid into small droplet/*memecahkan lipid kepada titisan kecil*
C Breakdown starch into small droplet/*memecahkan kanji kepada titisan kecil*
D Breakdown minerals into small droplet/*memecahkan mineral kepada titisan kecil*

14. Diagram 7 shows longitudinal section of villus.
Rajah 7 menunjukkan keratan memanjang vilus.

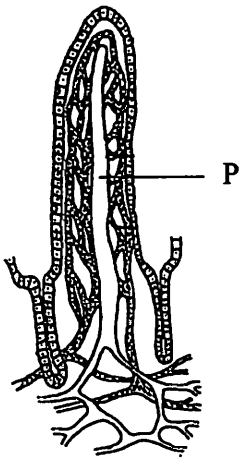


Diagram 7

Which substances is absorbed into structure P.
Bahan manakah diserap ke dalam struktur P.

A Glucose and amino acid / *glukos dan asid amino*
B Amino acid and fatty acid / *asid amino dan asid lemak*
C Glycerol and vitamin D / *gliserol dan vitamin D*
D Fatty acid and vitamin C / *asid lemak dan vitamin C*

15. Which is the process involved in changing glucose into maltose?
Antara proses berikut yang manakah terlibat dalam penukaran glukosa kepada maltosa?

A Condensation / *kondensasi*
B Photolysis / *fotolisis*
C Hydrolysis / *hidrolisis*
D Assimilation / *asimilasi*

16. Which of the following is produced during the light reaction of photosynthesis?
Antara berikut yang manakah dihasilkan semasa tindakbalas cahaya dalam fotosintesis?

A ATP / *ATP*
B Carbon dioxide / *karbon dioksida*
C Oxygen / *oksigen*
D Glucose / *glukosa*

17. Diagram 8 shows the structure of respiration system of certain organism.
Diagram 8 menunjukkan struktur bagi sistem respirasi suatu organisma.

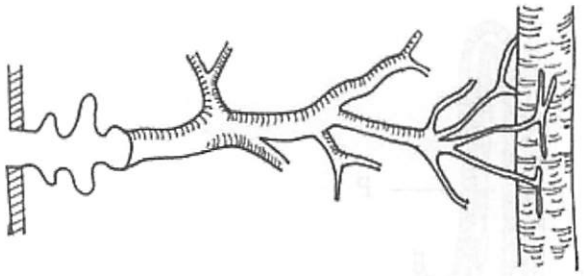


Diagram 8

Which organism has this structure?
Organisma yang manakah mempunyai struktur itu?

A Amphibia / *Amfibia*
B Insect / *Serangga*
C Fish / *Ikan*
D Reptile / *Reptilia*

18. Diagram 9 shows human respiratory system.
Gambarajah 9 menunjukkan sistem respirasi manusia.

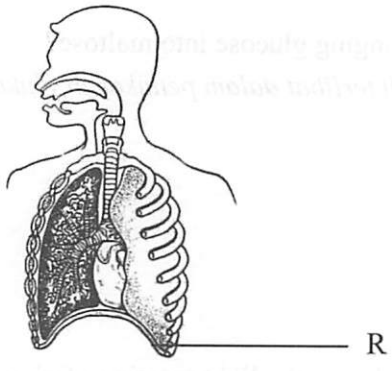


Diagram 9

What happen to structure R during exhalation?
Apakah yang berlaku ke atas struktur R semasa hembus nafas?

A Contract and become flatten / *Mengecut dan mendatar*
B Contract and become doom shape / *Mengecut dan melengkung*
C Relax and become flatten / *Mengendur dan mendatar*
D Relax and become doom shape / *Mengendur dan melengkung*

19. Diagram 10 shows the structure of alveoli.
Rajah 10 mennjukkan struktur alveolus.

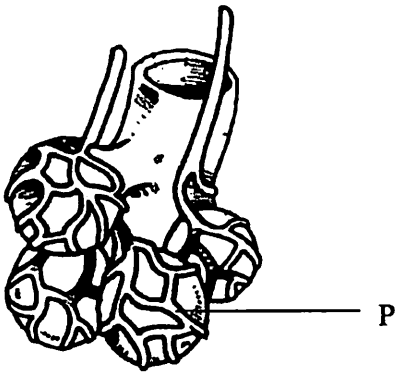


Diagram 10

What process occurs between alveolus and structure P during gaseous exchange?
Apakah proses yang berlaku di antara alveolus dengan struktur P semasa pertukaran gas?

A Osmosis / *Osmosis*
B Diffusion / *Resapan*
C Facilitated diffusion / *Resapan berbantu*
D Active transport / *Pengangkutan aktif*

20. Which structure is involved in the gaseous exchange in *Amoeba sp?*
Struktur yang manakah yang terlibat dalam pertukaran gas dalam Amoeba sp?

A Cell wall / *Dinding sel*
B Nucleus / *Nukleus*
C Cell membrane / *Membran sel*
D Vacuole / *Vakuol*

21 The following equation shows the process that take place in yeast.
Persamaan berikut menunjukkan proses yang berlaku dalam yis.

Glucose/Glukosa ⟶ S + Energy/Tenaga

What is S?.
Apakah S?.

A Water / *Air*
B Ethanol / *Etanol*
C Lactic acid / *Asid laktik*
D Carbon dioxide / *Karbon dioksida*

22. Diagram 11 shows an interaction between two organisms.
Rajah 11 menunjukkan satu interaksi antara dua organisma.

Diagram 11

What type of interaction is this?.
Apakah jenis interaksi ini?

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

23. Which of the following is the correct sequence in the process of plant succession in a a mangrove swamp?
Antara berikut yang manakah betul bagi proses sesaran tumbuhan di kawasan paya bakau?

A *Avicennia sp.* → *Soneratia sp.* → *Rhizophora sp.*
B *Avicennia sp.* → *Rhizophora sp.* → *Bruguiera sp.*
C *Soneratia sp.* → *Bruguiera sp.* → *Rhizophora sp.*
D *Bruguiera sp.* → *Rhizophora sp.* → *Avicennia sp.*

24. Which of the following describes a niche?
Antara berikut, yang manakah menerangkan tentang nich?

A The function of an organism in an ecosystem.
Peranan suatu organisma dalam suatu ekosistem.

B The natural surroundings where organisms live.
Persekitaran semulajadi di mana organisma hidup.

C Different species which live together in an ecosystem.
Spesies berlainan yang tinggal bersama dalam ekosistem

D Several species of organism which live together in the same place.
Beberapa spesies organisma yang tinggal bersama di tempat yang sama

25. Diagram 12 shows structure N on legume plant.
Rajah 12 menunjukkan struktur N pada tumbuhan legum.

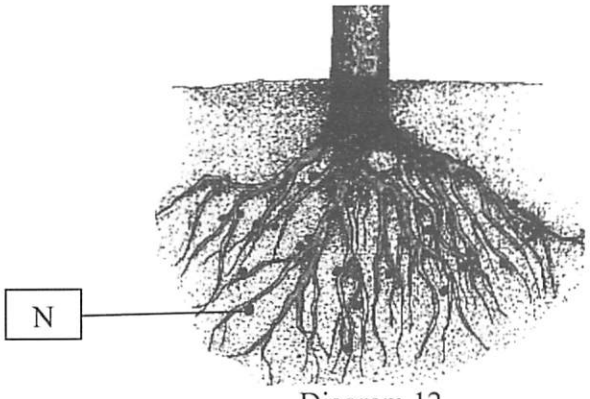


Diagram 12

Which of the following is the function of bacteria which live in N in Nitrogen cycle?
Antara yang berikut, yang manakah peranan bakteria yang hidup dalam N dalam kitar nitrogen?

A Fix nitrite to ammonium compound /*Mengikat nitrit kepada sebatian ammonia*
B Fix atmospheric nitrogen to nitrate /*Mengikat nitrogen di udara kepada nitrat*
C Fix ammonium compound to nitrite /*Mengikat sebatian ammonia kepada nitrit*
D Fix nitrite to nitrate /*Mengikat nitrit kepada nitrat*

26. Which of the following are the effects of destruction of ozone layer?
Antara yang berikut, yang manakah merupakan kesan penipisan lapisan ozon?

I. Melted of ice at polar area
Pencarian ais di kawasan kutub
II. Increase of sea level
Peningkatan aras laut
III. Increase the rate of photosynthesis of aquatic plant
Peningkatan kadar fotosintesis tumbuhan akuatik
IV. Extremely changes of climate
Perubahan cuaca yang melampau

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

27. Diagram 13 shows an experiment to determine the level of pollution in rivers P and Q.
Rajah 13 menunjukkan eksperimen untuk menentukan tahap pencemaran sungai P dan Q.

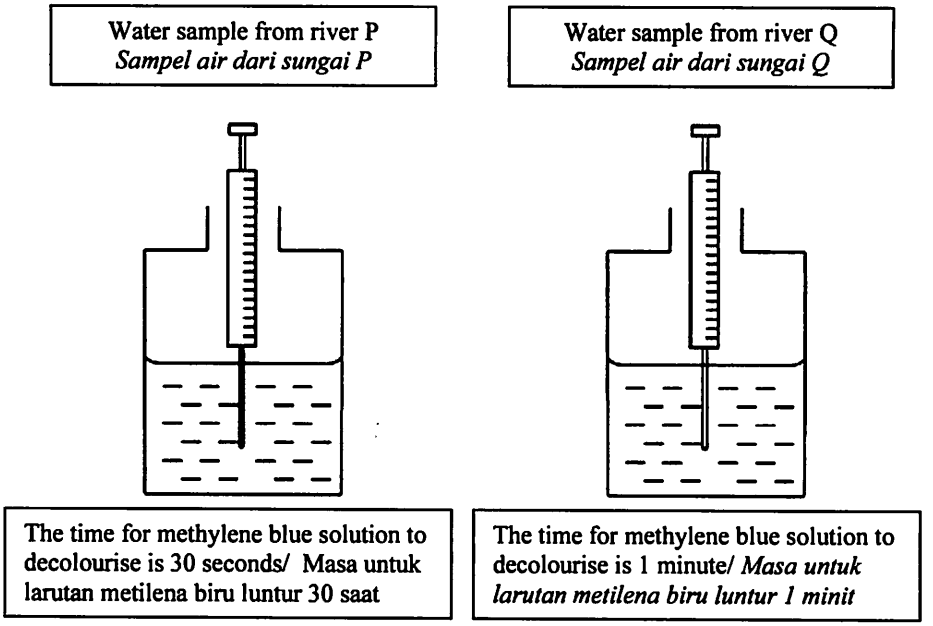


Diagram 13

Which is a correct conclusion from this experiment?
Yang manakah kesimpulan yang betul dari eksperimen ini?

A River Q contain more dissolved oxygen compare to river P
Sungai Q mengandungi kandungan oksigen terlarut lebih banyak dari sungai P
B River P is less polluted than river Q
Sungai P kurang tercemar berbanding Q
C BOD value of river Q is higher than river P
Nilai BOD sungai Q lebih tinggi berbanding P
D River Q contain more microorganism than river P
Sungai Q mengandungi lebih banyak mikroorganisma berbanding sungai P

28. Which of these blood vessels carry oxygenated blood to the heart?
Salur darah yang manakah membawa darah beroksigen ke jantung?

A Aorta / *Aorta*
B Vena cava / *Vena kava*
C Pulmonary artery / *Arteri pulmonari*
D Pulmonary Vein / *Vena pulmonary*

29. Diagram 14 shows a longitudinal section of the human heart.
Rajah 14 menunjukkan suatu keratan membujur jantung manusia.

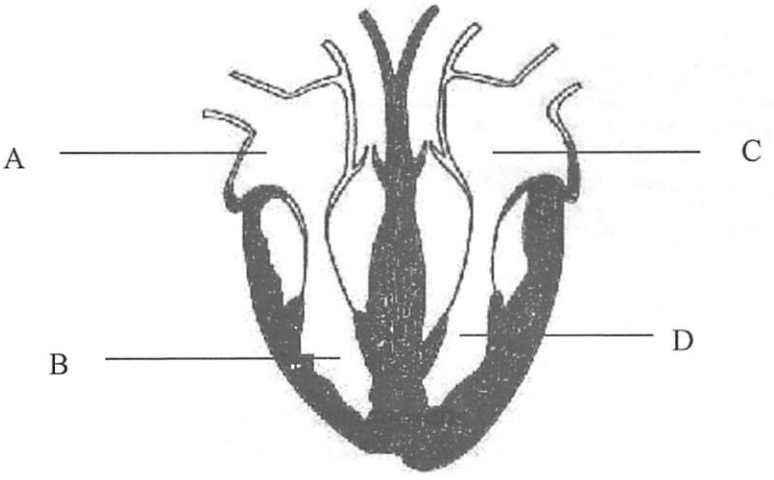


Diagram 14

Which of the labeled parts, A, B, C or D, pumps blood to all part of the body.
Antara bahagian berlabel A, B, C atau D yang manakah mengepam darah ke seluruh badan.

30. Diagram 15 shows the structure involved in body's deffence mechanism in human.
Rajah 15 menunjukkan struktur yang terlibat dalam mekanisma pertahanan badan dalam manusia.

Diagram 15

Which is the function of the structure shown.
Yang manakah fungsi struktur yang ditunjukkan.

A. Produces sebum that contain chemical to attack pathogen
Menghasilkan sebum yang mengandungi bahan kimia untuk menyerang patogen
B. Produces antibody to kill pathogen
Menghasilkan antibodi untuk membunuh pathogen
C. Produces phagocyte cells to engulf pathogen
Menghasilkan sel-sel fagosit untuk menelan pathogen
D. Secretes acid that can destroy pathogen
Merembeskan asid yang boleh memusnahkan pathogen

31. Diagram16 shows a cross section through the stem of a plant.
Rajah 16 menunjukkan keratan rentas melalui batang satu tumbuhan

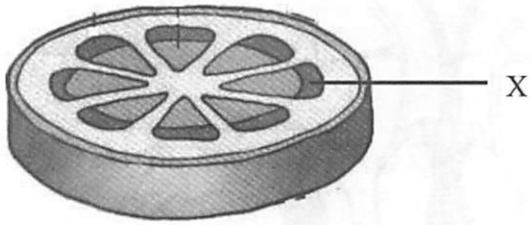
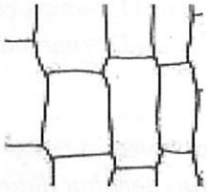


Diagram 16

Which of the following tissues A,B,C or D are commonly found in X?
Antara tisu-tisu A, B, C dan D, yang mana biasa terdapat di X?

A	B	C	D
			

32 Table 2 shows the result of an experiment to study the size population of garden snails.
Jadual 2 menunjukkan keputusan kajian ke atas populasi siput babi.

Capture *Tangkapan*	Number of garden snails *Bilangan siput*	
First *Kali pertama*	120 were marked *120 bertanda*	
Second *Kali kedua*	50 marked *50 bertanda*	80 unmarked *80 tidak bertanda*

Table 2

What is the approximate population of the garden snails?
Apakah anggaran saiz populasi siput babi?

A 195
B 200
C 250
D 312

33. Less production of antidiuretic hormone from pituitary gland will effect the production of urine in human.
Pengeluaran hormon anti diuresis yang sedikit dari kelenjar pituitari akan memberi kesan ke atas penghasilan air kencing dalam manusia.

What is the effect of the production of urine?
Apakah kesannya ke atas penghasilan air kencing?

A Little and concentrated / *Sedikit dan pekat*
B Little and diluted / *Sedikit dan cair*
C Much and concentrated / *Banyak dan pekat*
D Much and diluted / *Banyak dan cair*

34. The following statements are about eutrophication.
Pernyataan berikut adalah tentang eutrofikasi.

P – The pond is covered with algae
Kolam ditutupi oleh alga
Q – The rate of bacterial reproduction increase
Kadar pembiakan bacteria bertambah
R – The flow of excess organic fertiliser into the pond
Aliran lebihan baja organic ke dalam kolam
S – The number of organism in the pond decrease
Bilangan organisma dalam kolam berkurang
T – The BOD value increase
Nilai BOD meningkat

Which of the following sequences is correct about the eutrophication?
Antara berikut, yng manakah merupakan turutan yang betul tentang eutrofikasi?

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

35. Which of the following plant hormones stimulates parthenocarpy?
Antara yang berikut, hormon tumbuhan yang manakah merangsang partenokarpi?

A Ethylene / *Etilena*
B Cytokinine / *Sitokinin*
C Auxins/ *Auksin*
D Gibberellin / *Giberelin*

36. Diagram 17 shows a schematic diagram of human blood clotting mechanism.
Rajah 17 menunjukkan rajah skema untuk mekanisma pembekuan darah manusia

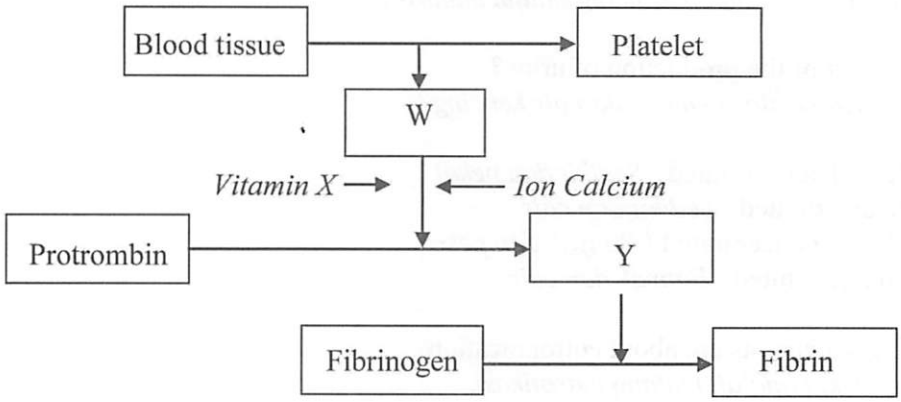


Diagram 17

What is W, vitamin X , and Y?
Apakah W, vitamin X and Y?

	W	Vitamin X	Y
A	Trombokinase	K	Trombin
B	Trombokinase	D	Trombin
C	Eryhtrocyte	K	Trombin
D	Haemoglobin	D	Trombin

37. Diagram 18 shows one type of twin.
Rajah 18 menunjukkan sejenis kembar.

Diagram 18

Which of the following statement is **correct** about the twin?
*Yang manakah antara berikut **benar** tentang kejadian kembar itu?*

A Fertilization between one sperm and one ovum developed a zygote and the zygote will divide into two
Persenyawaan satu sperma dengan satu ovum hingga membentuk satu zigot dan zigot membahagi kepada dua

B Fertilization between two sperms and one ovum developed a zygote and the zygote is divided into two
Persenyawaan dua sperma dengan satu ovum hingga membentuk zigot dan zigot membahagi dua

C Fertilization between two sperms and one ovum developed into two zygotes
Persenyawaan dua sperma dengan satu ovum hingga membentuk dua zigot

D Fertilization between two sperms and two ovum developed into two zygotes
Persenyawaan dua sperma dengan dua ovum hingga membentuk dua zigot

38. Diagram 19 shows longitudinal section of root tip.
Rajah 19 menunjukkan keratan hujung akar.

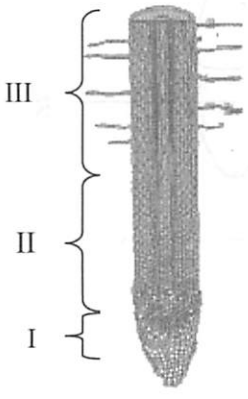
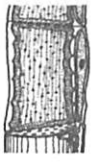
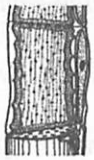
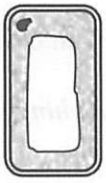
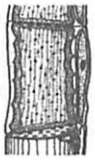
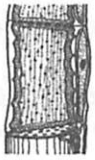


Diagram 19

Which of the following cells corresponds to the zones as shown above?
Manakah antara sel berikut bersesuaian dengan zon- zon yang ditunjukkan di atas?

A

Zone I	Zone II	Zone III
		

B			
C			
D			

39. Diagram 20 shows human forearm limb.
Rajah 20 menunjukkan anggota hadapan manusia

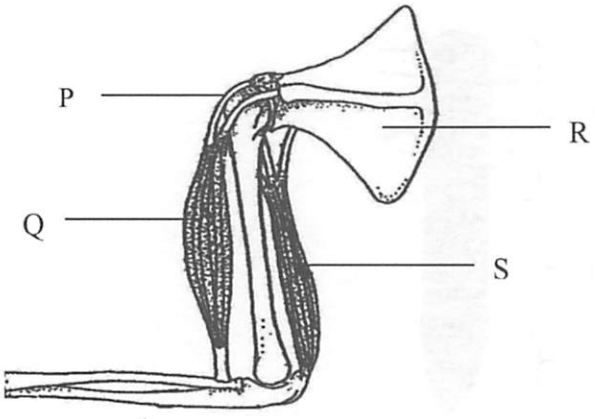


Diagram 20

Which of the following represent P, Q, R and S?
Antara berikut yang manakah mewakili P, Q, R dan S?

	P	Q	R	S
A	Ligament	Biceps muscle	Scapula	Triceps muscle
B	Ligament	Triceps muscle	Scapula	Biceps muscle
C	Tendon	Triceps muscle	Scapula	Biceps muscle
D	Tendon	Biceps muscle	Scapula	Triceps muscle

40. The following measurements were made during an experiment to determine the calorific value of rice.
Bacaan berikut diperolehi semasa menjalankan satu eksperimen untuk menentukan nilai kalori nasi.

Mass of rice/Jisim nasi	= 2g
Mass of water/Jisim air	= 10 g
Initial water temperature/Suhu awal air	= 28 ^{0}C
Final water temperature/Suhu akhir air	= 56 ^{0}C

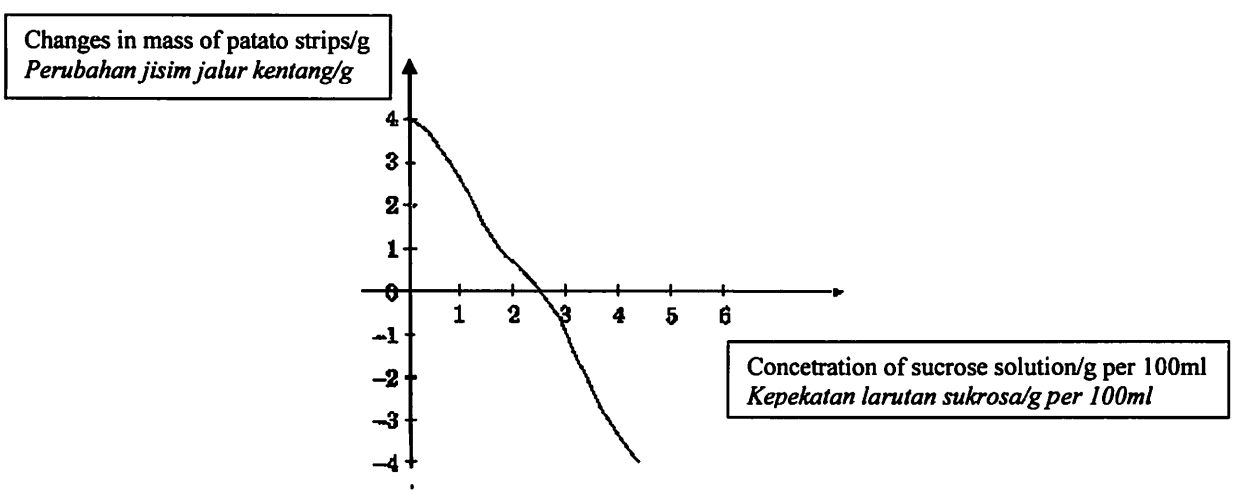
What is the calorific value of rice?
Berapakah nilai kalori nasi itu?

A 140 J g^{-1}
B 280 J g^{-1}
C 588 J g^{-1}
D 1176 J g^{-1}

41. The most suitable immunity to be given to children to avoid tuberculosis is
Jenis keimunan yang paling sesuai diberikan kepada kanak-kanak untuk mengelakkan penyakit batuk kering ialah

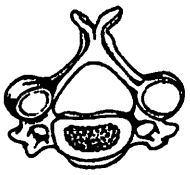
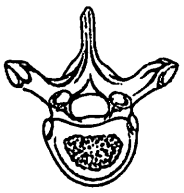
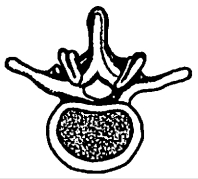
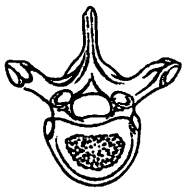
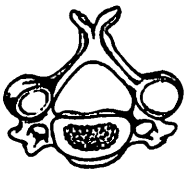
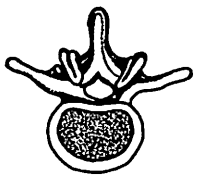
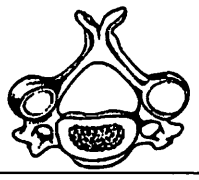
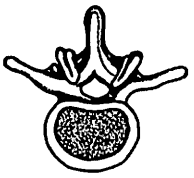
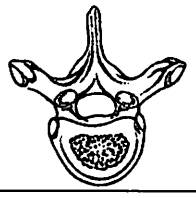
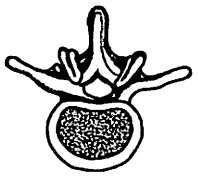
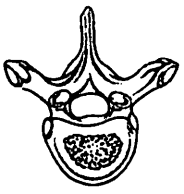
A artificial passive immunity / *keimunan pasif buatan*
B artificial active immunity / *keimunan aktif buatan*
C natural passive immunity / *keimunan pasif semulajadi*
D natural active immunity / *keimunan aktif semulajadi*

42. The graph 1 shows the changes of potato strips immersed in different concentration of sucrose solution.
Graf 1 menunjukkan perubahan jisim jalur ubi kentang yang direndam dalam larutan sukrosa yang berbeza kepekatan.

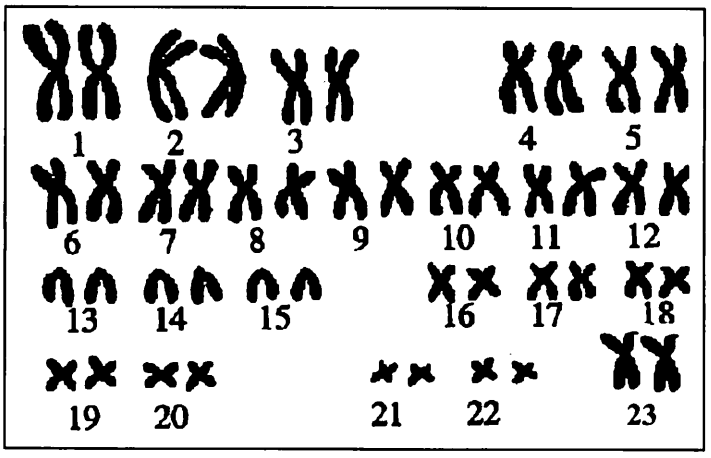


Graph 1

Which of the following are correct bones at P, Q and R?
Yang manakah antara berikut merupakan tulang yang betul pada P, Q dan R?

	P	Q	R
A			
B			
C			
D			

48. The diagram 24 shows the karyotype of an individual.
Rajah 24 menunjukkan kariotip bagi seorang individu.



Rajah 24

Which of the following statement is **correct** about the twin?
*Yang manakah antara berikut **benar** tentang kejadian kembar itu?*

A Fertilization between one sperm and one ovum developed a zygote and the zygote will divide into two
Persenyawaan satu sperma dengan satu ovum hingga membentuk satu zigot dan zigot membahagi kepada dua

B Fertilization between two sperms and one ovum developed a zygote and the zygote is divided into two
Persenyawaan dua sperma dengan satu ovum hingga membentuk zigot dan zigot membahagi dua

C Fertilization between two sperms and one ovum developed into two zygotes
Persenyawaan dua sperma dengan satu ovum hingga membentuk dua zigot

D Fertilization between two sperms and two ovum developed into two zygotes
Persenyawaan dua sperma dengan dua ovum hingga membentuk dua zigot

38. Diagram 19 shows longitudinal section of root tip.
Rajah 19 menunjukkan keratan hujung akar.

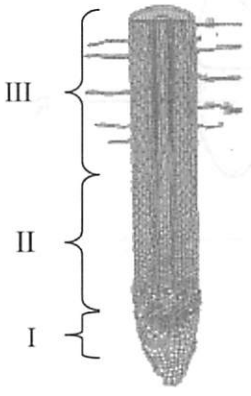
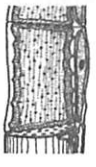
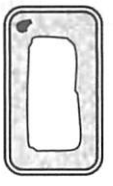


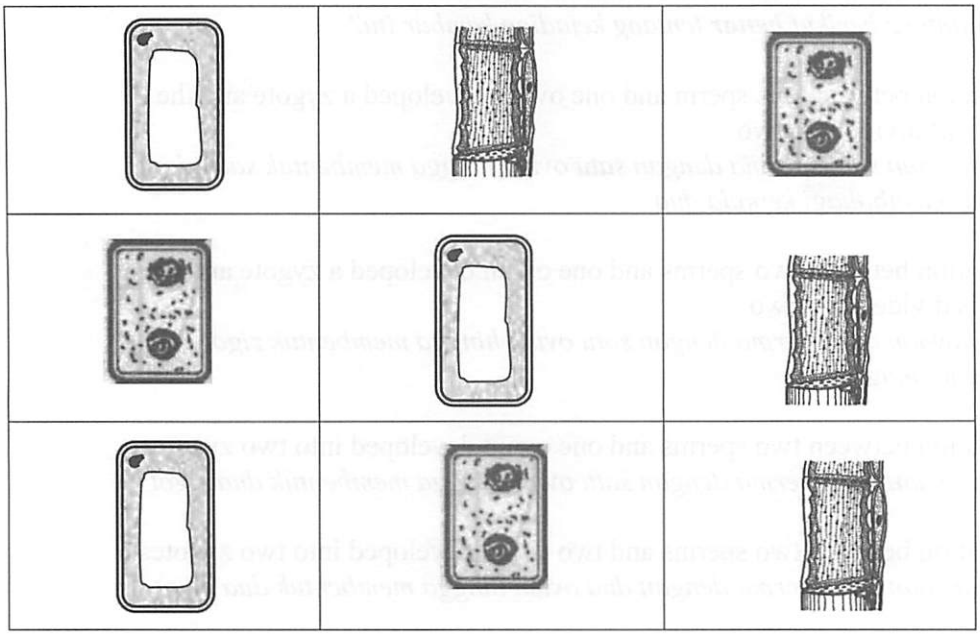
Diagram 19

Which of the following cells corresponds to the zones as shown above?
Manakah antara sel berikut bersesuaian dengan zon- zon yang ditunjukkan di atas?

A

Zone I	Zone II	Zone III
		

B



C

D

39. Diagram 20 shows human forearm limb.
Rajah 20 menunjukkan anggota hadapan manusia

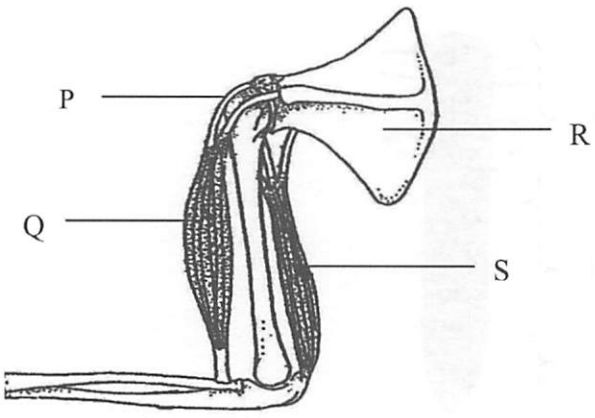


Diagram 20

Which of the following represent P, Q, R and S?
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	P	Q	R	S
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C	Tendon	Triceps muscle	Scapula	Biceps muscle
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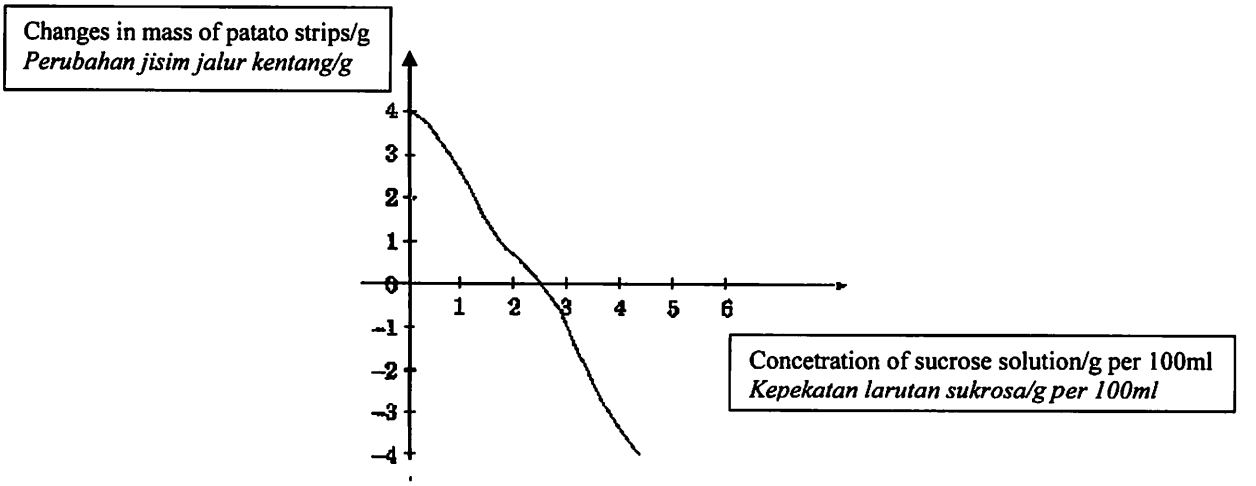
42. The graph 1 shows the changes of potato strips immersed in different concentration of sucrose solution.
Graf 1 menunjukkan perubahan jisim jalur ubi kentang yang direndam dalam larutan sukrosa yang berbeza kepekatan.



Graph 1

Based on the graph, which of the following concentrations of sucrose solution should be used so that a flaccid potato strip regains its turgidity?
Berdasarkan graf di atas, kepekatan larutan yang manakah patut digunakan supaya jalur ubi kentang yang telah flasid menjadi segah semula?

A 1.5 g per 100 ml
B 2.5 g per 100 ml
C 3.5 g per 100 ml
D 4.5 g per 100 ml

43. In the 16th week, a pregnant woman is physically injured. The injury causes the placenta to stop functioning.
Dalam minggu ke-16 seorang wanita hamil mengalami kecederaan fizikal. Kecederaan itu menyebabkan plasentanya berhenti berfungsi.

Which of the following is the effect of the injury?
Antara berikut yang manakah kesan kecederaan itu?

A The foetus is aborted / *Fetus keguguran*
B The foetus continues to develop / *Fetus terus berkembang*
C A Down's syndrome child is born / *Anak sindrom Down dilahirkan*
D The uterine wall continues to thicken / *Dinding uterus semakin tebal*

44. The allele for presence of dimple in human is dominant. A man with dimples is heterozygous while his wife does not have dimple. The probability of getting a child with dimples is
Alel untuk kehadiran lesung pipit bagi manusia adalah dominan. Seorang lelaki berlesung pipit adalah heterozigot manakala isterinya tidak berlesung pipit. Kebarangkalian mendapatkan anak berlesung pipit ialah

A 1
B ¾
C ½
D ¼

45. The diagram 21 shows stages in the development of an embryo sac in the ovule of a flowering plant.
Rajah 21 menunjukkan peringkat perkembangan pundi embrio dalam ovul tumbuhan berbunga.

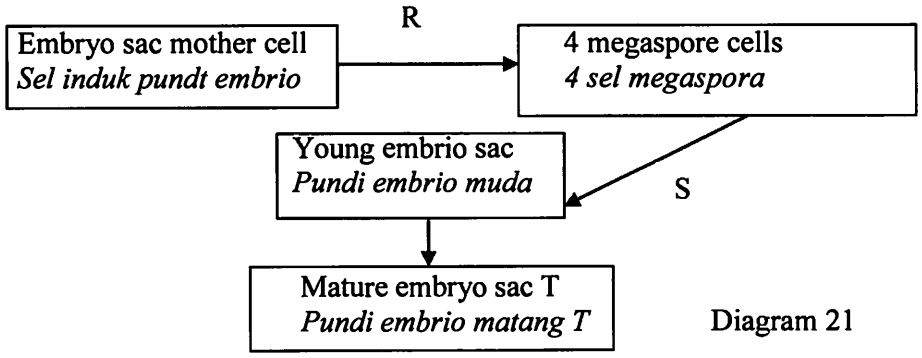


Diagram 21

What are R, S and T?
Apakah R, S dan T?

	R	S	T
A	Mitosis	Meiosis	4 haploid nuclei /*4 nukleus haploid*
B	Mitosis	Meiosis	8 haploid nuclei / *8 nukleus haploid*
C	Meiosis	Mitosis4	haploid nuclei / *nukleus haploid*
D	Meiosis	Mitosis8	haploid nuclei / *nukleus haploid*

46. The diagram 22 shows a monohybrid cross between mango tree W and mango tree X. 50% of the offspring are tall and 50% are dwarf.
Rajah 22 menunjukkan kacukan antara pokok mangga W dan pokok mangga X. 50% daripada anaknya adalah tinggi dan 50% lagi adalah kerdil.

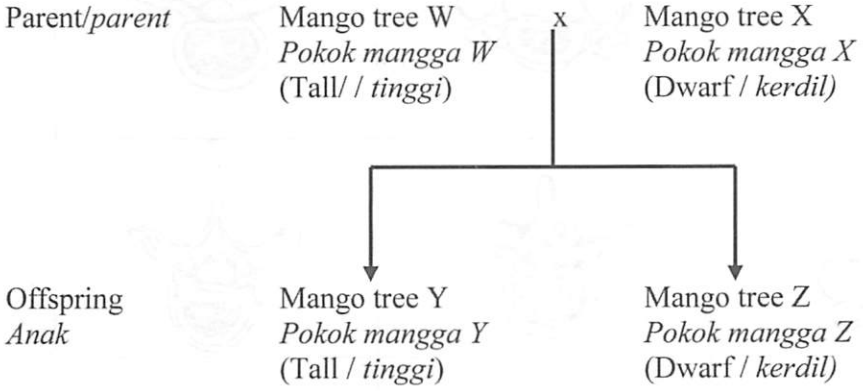


Diagram 22

If mango tree Y is crossed with mango tree Z, what percentage of the trees produced will be tall?
Jika pokok mangga Y dikacukkan dengan pokok mangga Z, berapakah peratus pokok mangga yang dihasilkan adalah tinggi?

A 0 %
B 25 %
C 50 %
D 75 %

47. Diagram 23 show human vertebrae and a typical bone.
Rajah 23 menunjukkan turus vetebra manusia dan tulang tipikal.

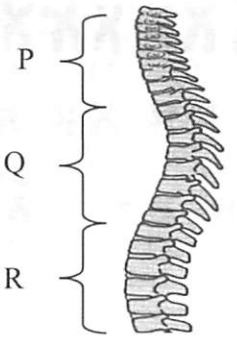
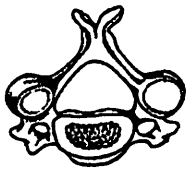
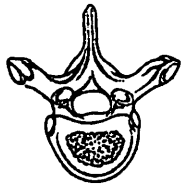
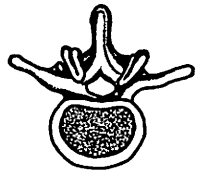
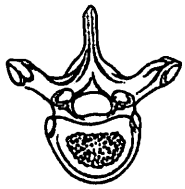
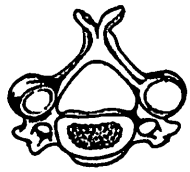
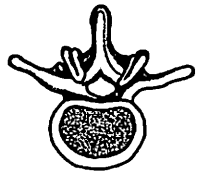
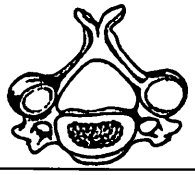
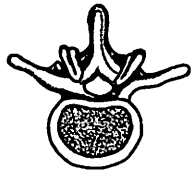
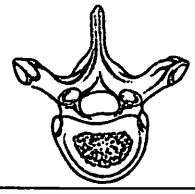
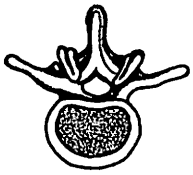
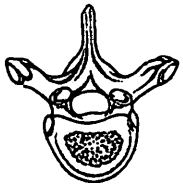
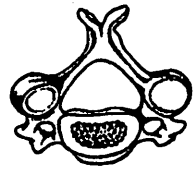
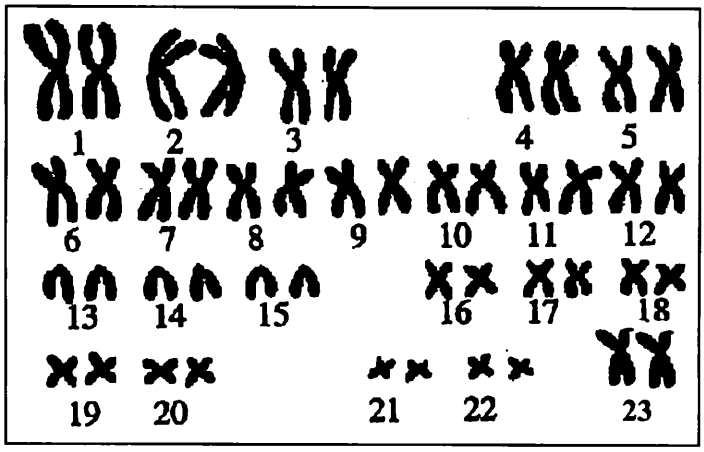


Diagram 23

Which of the following are correct bones at P, Q and R?
Yang manakah antara berikut merupakan tulang yang betul pada P, Q dan R?

	P	Q	R
A			
B			
C			
D			

48. The diagram 24 shows the karyotype of an individual.
Rajah 24 menunjukkan kariotip bagi seorang individu.



Rajah 24

Which of the following shows the number of chromosomes in gamete produced by the individual?

Manakah antara berikut menunjukkan bilangan kromosom pada gamet yang dihasilkan oleh individu itu?

A 22 + Y

B 22 + X

C 22 + XX

D 44 + X

49. Diagram 25 shows a cross between a normal grey-coloured mouse and an albino mouse.

Rajah 25 menunjukkan kacukan antara seekor mencit kelabu yang normal dan seekor mencit albino

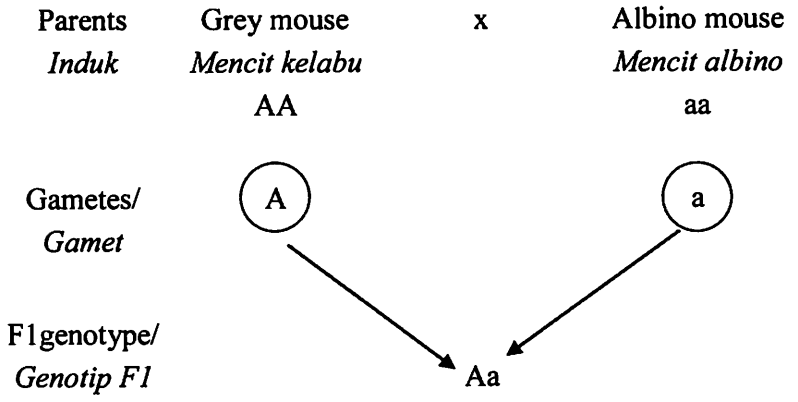


Diagram 25

Which genotypes would result from a cross between the F1 mouse and an albino mouse?

Manakah genotip hasil daripada kacukan antara mencit F1 dan mencit albino?

A Aa only / *Aa sahaja*
B AA only / *AA sahaja*
C Aa and aa / Aa dan aa
D AA and Aa / *AA dan Aa*

50. Diagram 26 shows a human activity on the environment.
Rajah 26 menunjukkan aktiviti manusia terhadap alam sekitar.

Diagram 26

Which of the following is the result of this activity?
Antara berikut yang manakah akibat daripada aktiviti tersebut?

I Soil erosion and landslide/*hakisan tanah dan tanah runtuh*
II Flooding/*banjir*
III Climatic changes/*perubahan cuaca*
IV Extinction of flora and fauna/*kepupusan haiwan dan tumbuhan*

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

END OF QUESTION PAPER

NAMA : ..... *TINGKATAN :* .....

SULIT
4551/2
Biologi
KERTAS 2
Ogos/ Sept 2013

2 ½ jam

PENTAKSIRAN SUMATIF 3
SIJIL PELAJARAN MALAYSIA 2013

BIOLOGI
Kertas 2
Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini mengandungi tiga bahagian :* **Bahagian A,** ***Bahagian B*** *dan* **Bahagian C**.
2. *Jawab* **semua** *soalan dalam* **Bahagian A.** *Jawapan kepada* **Bahagian A** *hendaklah ditulis dalam ruang jawapanyang disediakan*
3. *Jawab* **dua** *soalan dari* **Bahagian B** *dan jawapan kepada* **Bahagian B** *hendaklah ditulis dalam ruang bergaris yang disediakan di bahagian akhir kertas soalan. Anda diminta menjawab dengan lebih terperinci untuk* **Bahagian B,** *Jawapan mestilah jelas dan l ogik. Dalam jawapan anda, persamaan, gambar rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda boleh digunakan.*
4. *Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
5. *Markah yang diperuntukkan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan.*
6. *Sekiranya anda hendak membatalkan sesuatu jawapan, buat garisan di atas jawapan itu.*
7. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram. Walau bagaimanapun, langkah mengira perlu ditunjukkan*
8. *Masa yang dicadangkan untuk menjawab* **Bahagian A** *ialah 90 minit,* **Bahagian B** *60 minit.*
9. *Semua kertas jawapan hendaklah diserahkan di akhir peperiksaan.*

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

Kertas soalan ini mengandungi 18 halaman bercetak.

TERENGGANU NEGERI ANJUNG ILMU

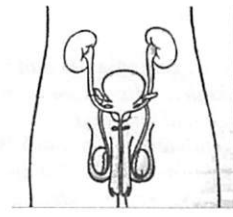
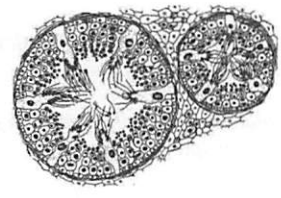
Dibiayai oleh:
Kerajaan Negeri Terengganu

Dicetak Oleh:
Percetakan Yayasan Islam Terengganu Sdn. Bhd.
Tel: 609-666 8611/6652/8601 Faks: 609-666 0611/0063

For Examiner's Use

SECTION A
Answer **all** the questions
*Jawab **semua** soalan*

1. Table 1 shows the examples of cell organisations level.
Jadual 1 menunjukkan contoh aras organisasi sel.

Level of cell organization *Aras organisasi sel*	**Structures** *Struktur*
1. CELL / *SEL*	
2. ORGANELLE / *ORGANEL*	
3. TISSUE / *TISU*	
4. SYSTEM / *SISTEM*	

Tabel 1 / *Jadual 1*

1(a)

3

(a) Match the level of cells organisation to the structures in Table 1.
Padankan aras organisasi sel terhadap struktur dalam Jadual 1.

[3 *marks*]

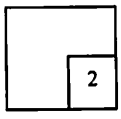
For Examiner's Use

(b) (i) Based to the Table 1, name the system and one organ found in it.
Berdasarkan Jadual 1, namakan sistem dan satu organ yang terdapat di dalamnya.

System / *Sistem :* .....

Organ / *Organ* : .....
[2 *marks*]

1(b)(i)



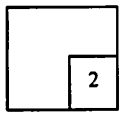
(ii) Explain TWO structural adaptations of cell in Table 1 to carry out their function efficiently.
Terangkan DUA ciri penyesuaian struktur sel dalam Jadual 1 untuk menjalankan fungsinya dengan cekap.

.....

.....

.....
[2 *marks*]

1(b)(ii)

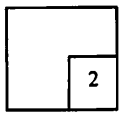


(c) Explain what will happen to cell in Table 1 if mitochondria are absent.
Terangkan apa yang akan berlaku kepada sel dalam Jadual 1 jika mitokondria tidak ada.

.....

.....
[2 *marks*]

1(c)



(d) Explain the necessity of cell specialisation in multicellular organisms compare to unicellular organism.
Terangkan keperluan pengkhususan sel dalam organisma multisel berbanding organisma unisel.

.....

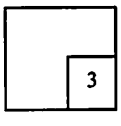
.....

.....

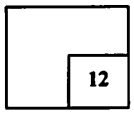
.....

.....
[3 *marks*]

1(d)



Total



For Examiner's Use

2. Diagram 2.1 shows the lock and key hypothesis in an enzyme reaction on sugar in milk.
Rajah 2.1 menunjukkan hipotesis kunci dan mangga dalam tidakan enzim ke atas gula dalam susu.

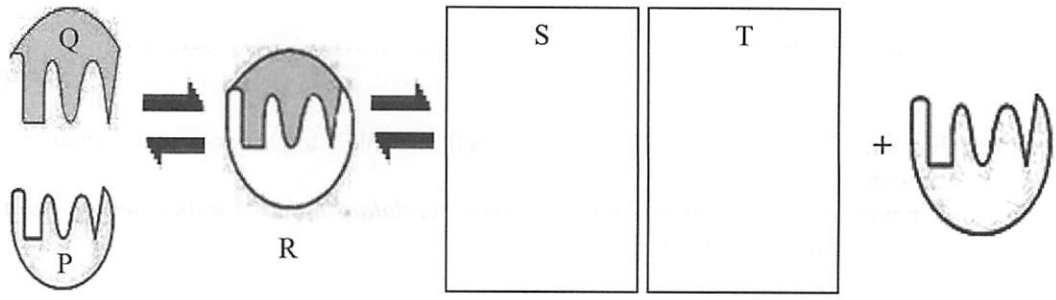


Diagram 2.1
Rajah 2.1

(a) Based on the Diagram 2.1
Berdasarkan Rajah 2.1

(i) Name P, Q and R
Namakan P, Q dan R

2(a)(i) 2

P: .....

Q: .....

R: .....

[2 *marks*]

2(a)(ii) 2

(ii) Draw the diagram in the spaces S and T provided in Diagram 2.1 to complete the mechanism of the enzyme reaction.
Lukis rajah dalam petak S dan T yang disediakan dalam Rajah 2.1 untuk melengkapkan mekanisme tindakan enzim.

[2 *marks*]

(b) Based on Diagram 2.1, explain
Berdasarkan Rajah 2.1, terangkan

(i) **one** characteristic of the enzyme
***satu** ciri enzim*

2(b)(i) 2

.....

.....

.....

[2 *marks*]

For Examiner's Use

(ii) enzymes action based on this hypothesis
Tindakan enzim berdasarkan hipotesis ini

.....

.....

.....

.....

[3 *marks*]

2(b)(ii)

3

(c) The effect of different substrate concentrations on the rate of an enzyme-catalysed reaction can be seen on the graph in Diagram 2.2.
Kesan kepekatan substrat yang berbeza ke atas tindakan katalisis enzim dapat dilihat pada graf dalam Rajah 2.2.

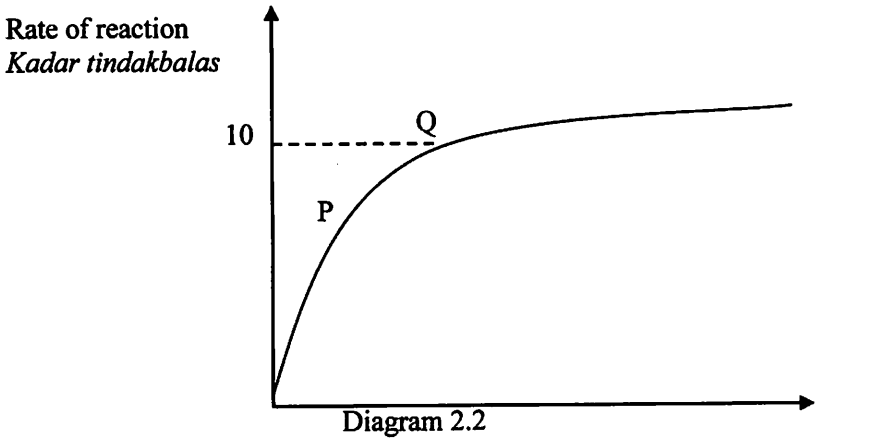


Diagram 2.2
Rajah 2.2

Based on the graph in Diagram 2.2, explain the enzymes action at Q.
Berdasarkan pada graf dalam Rajah 2.2, terangkan tindakan enzim pada Q.

.....

.....

.....

.....

[3 *marks*]

2(c)

3

Total

12

For Examiner's Use

3. Diagram 3.1 shows a structure found in human intestine.
Rajah 3.1 menunjukkan struktur yang ditemui dalam usus manusia.

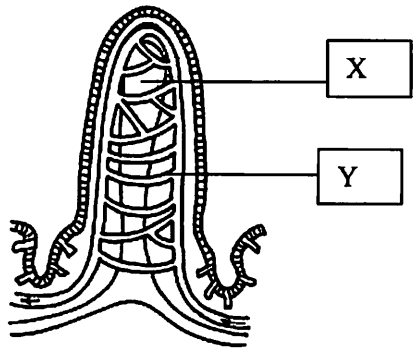


Diagram 3.1
Rajah 3.1

3(a)(i) 1

a)(i) Name the structure shown in Diagram 3.1
Namakan struktur yang ditunjukkan dalam Rajah 3.1.

.....

[1 *mark*]

3(a)(ii) 2

(ii) How the structure named in (a)(i) is adapted to its function.
Bagaimanakah struktur yang dinamakan dalam (a)(i) diadaptasi untuk menjalankan fungsinya.

.....

.....

[2 *marks*]

3(b) 2

b) State the function of X and Y in absorption.
Nyatakan peranan X dan Y dalam penyerapan.

X : .....

Y : .....

[2 *marks*]

c) Diagram 3.2 shows a schematic diagram which represent the assimilation process in human.
Rajah 3.2 menunjukkan rajah skema yang mewakili proses asimilasi dalam manusia

For Examiner's Use

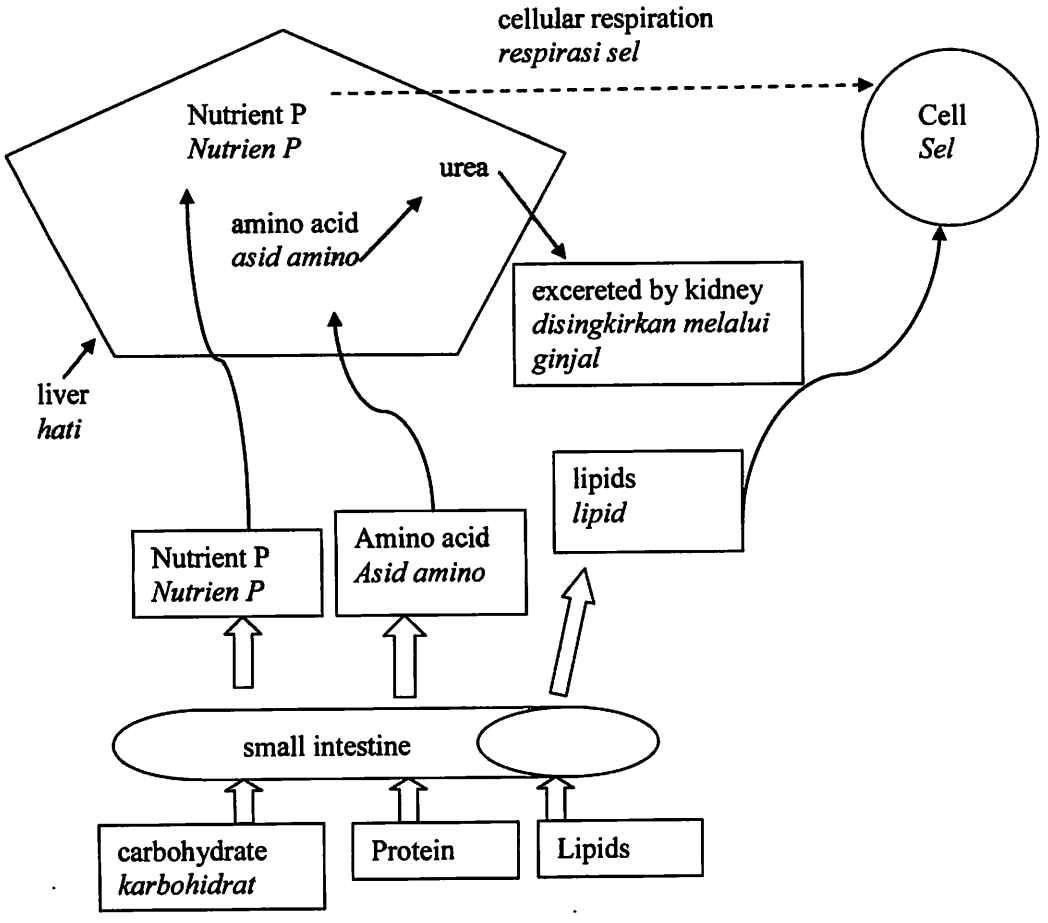


Diagram 3.2
Rajah 3.2

(i) Explain the function of liver in assimilation.
Terangkan fungsi hati dalam asimilasi.

3(c)(i)

.....

.....

.....

[2 *marks*]

2

For Examiner's Use

3(c)(ii)

2

(ii) Based on diagram, explain the assimilation of nutrient P.
Berdasarkan rajah, terangkan asimilasai ke atas nutrien P.

.....

.....

.....

[2 *marks*]

(iii) Explain why assimilation of lipids do not occur directly in liver.
Terangkan mengapa asimilasi ke atas lipid tidak berlaku secara terus dalam hati.

.....

3(c)(iii

3

.....

.....

.....

[3 *marks*]

Total

12

For Examiner's Use

4. Figure 4.1 shows the circulatory system and the lymphatic system in the human body.
Rajah 4.1 menunjukkan sistem peredaran darah dan sistem limfa dalam badan manusia.

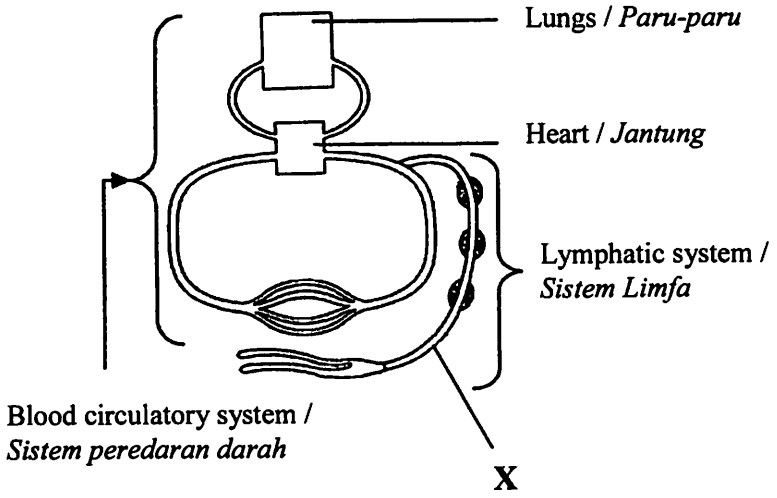


Figure 4.1/ *Rajah 4.1*

(a) (i) What is fluid X ?
Apakah bendalir X

.....
[1 *mark*]

4(a)(i) 1

(ii) State the different composition in X and blood plasma ?
Nyatakan perbezaan kandungan di dalam X dengan plasma darah

.....

.....
[2 *marks*]

4(a)(ii) 2

(b) Explain how the product of lipid digestion is transported by lymphatic system and blood circulatory system.
Terangkan bagaimana hasil pencernaan lipid diangkut oleh sistem peredaran limfa dan sistem peredaran darah ke sel-sel badan.

.....

.....
[2 *marks*]

4(b) 2

For Examiner's Use

(c)

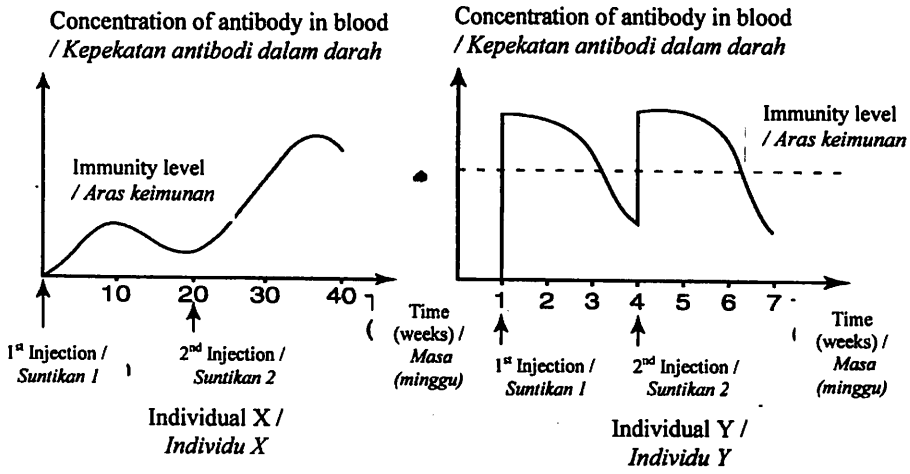


Diagram 4.2 / *Rajah 4.2*

The diagram 4.2 shows the change in the amount of antibodies of individuals X and Y which have been injected with a vaccine and an antiserum respectively.
Rajah 4.2 menunjukkan perubahan jumlah antibodi individu X dan Y yang telah disuntik dengan vaksin dan antiserum masing-masing.

4(c)(i) 2

(i) What type of immunity is obtained by X and Y respectively ?
Apakah jenis keimunan yang diperolehi oleh individu X dan Y masing-masing ?

X : .....

Y : .....

[2 *marks*]

4(c)(ii) 2

(ii) Why is a second injection required by individuals X and Y ?
Mengapakah suntikan kedua diperlukan oleh individu X dan Y ?

X : .....

Y : .....

[2 *marks*]

4(c)(iii) 2

(iii) State two differences between the types of immunity obtained by individuals X and Y.
Nyatakan dua perbezaan di antara jenis keimunan yang diperolehi oleh individu X dan Y

.....

.....

[2 *marks*]

(d) Why AIDS patient does not have antibodies to against the disease.
Mengapa pesakit AIDS tidak mempunyai antibodi untuk melawan penyakit ini.

.....

.....

[1 *mark*]

For Examiner's Use

4(d)

1

Total

12

For Examiner's Use

5 Diagram 5 shows the organs X and glands Y involved in regulating the human body temperature.
Rajah 5 menunjukkan organ X dan kelenjar Y yang terlibat dalam pengawalaturan suhu badan manusia

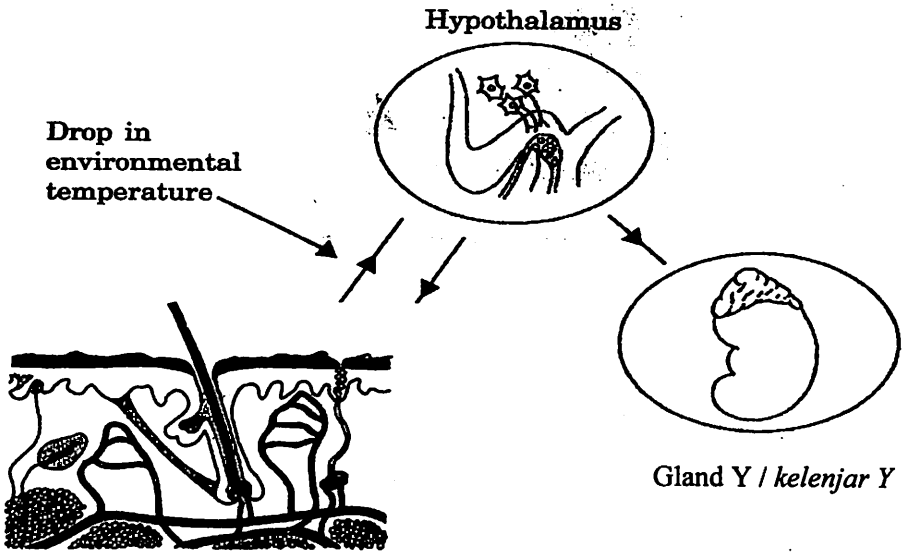


Diagram 5
Rajah 5

5(a)(i) [1]

a) (i) Name the mechanism involve to regulate body temperature
Namakan mekanisme yang terlibat untuk mengawalatur suhu badan

.....

[1 *mark*]

5(a)(ii) [2]

(ii) State the way organ X and gland Y response to regulate body temperature
Nyatakan cara organ X dan kelenjar Y bergerakbalas untuk mengawalatur suhu badan

Organ X / *organ X* : .....

Gland Y / *kelenjar Y* : .....

[2 *marks*]

b) Human body temperature is maintained at 37°C.
Explain the roles of the hair erector muscle, blood capillary and sweat gland in maintaining the body temperature on a hot day.
Suhu badan manusia dikekalkan pada 37°C.
Terangkan peranan otot regang rambut, kapilari darah dan kelenjar peluh dalam mengekalkan suhu badan pada hari panas

Hair Erector muscle / *otot regang rambut*:

.....

.....

.....

Blood capillary / *kapilari darah*:

.....

.....

.....

Sweat gland / *kelenjar peluh*:

.....

.....

.....

[6 *marks*]

For Examiner's Use

5(b)

6

c) A student skates on the ice skating rink.
Based on Diagram 5, explain how gland Y helps to regulate the student's body temperature.
Seorang pelajar meluncur di atas landasan meluncur ais.
Berdasarkan Rajah 5, terangkan bagaimana kelenjar Y membantu mengawalatur suhu badan pelajar tersebut

.....

.....

.....

.....

[3 *marks*]

5(c)

3

Total

12

SECTION B
[40 *marks*]
Answer **any** two questions from this section
*Jawab mana-mana **dua** soalan daripada bahagian ini*

6. (a) Diagram 6.1 shows two types of microorganisms, P and Q.
Rajah 6.1 menunjukkan dua jenis mikroorganisma, P dan Q.

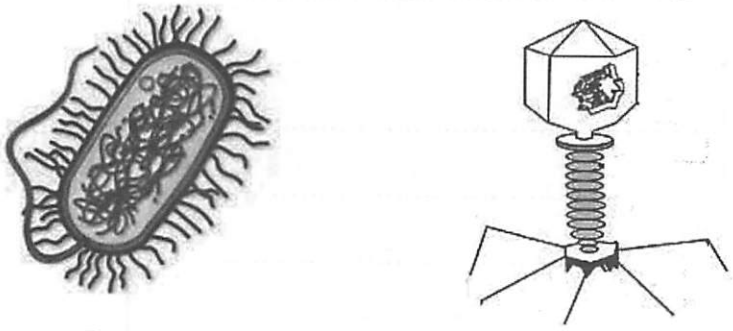


Diagram 6.1
Rajah 6.1

State the differences between microorganisms P and Q.
Nyatakan perbezaan antara mikroorganisma P dan Q.

[4 *marks*]

(b) Diagram 6.2 shows the transmission and symptoms of diseases in human
Rajah 6.2 menunjukkan cara jangkitan dan simptom penyakit dalam manusia.

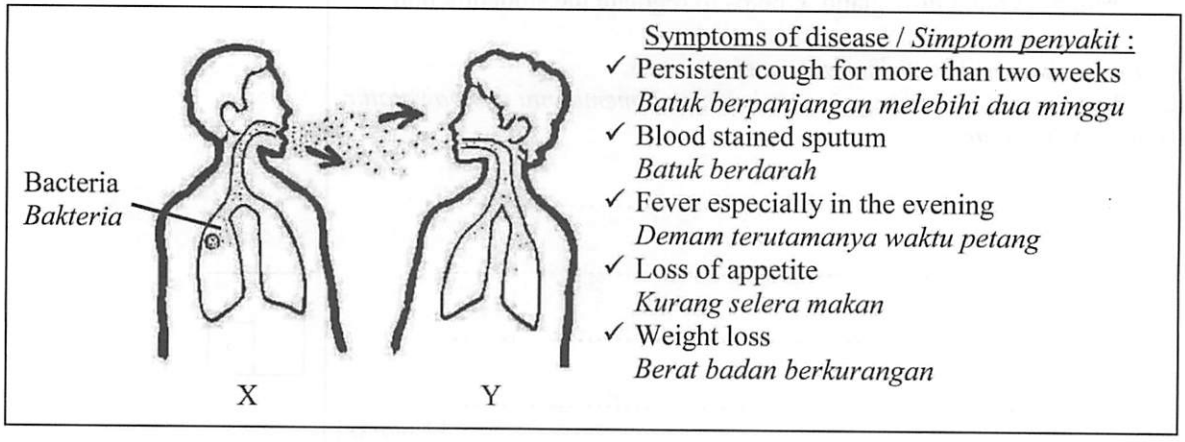


Diagram 6.2
Rajah 6.2

Based on Diagram 6.2,
Berdasarkan Rajah 6.2,

Name the disease faced by Y. Explain how this disease infected Y
Namakan penyakit yang akan dihadapi oleh Y. Terangkan bagaimana penyakit ini boleh menjangkiti Y.

[6 *marks*]

(c) Diagram 6.3 shows the nitrogen cycle which plays an important role in the formation of protein.
Rajah 6.3 menunjukkan kitar nitrogen yang memainkan peranan penting dalam pembentukan protein.

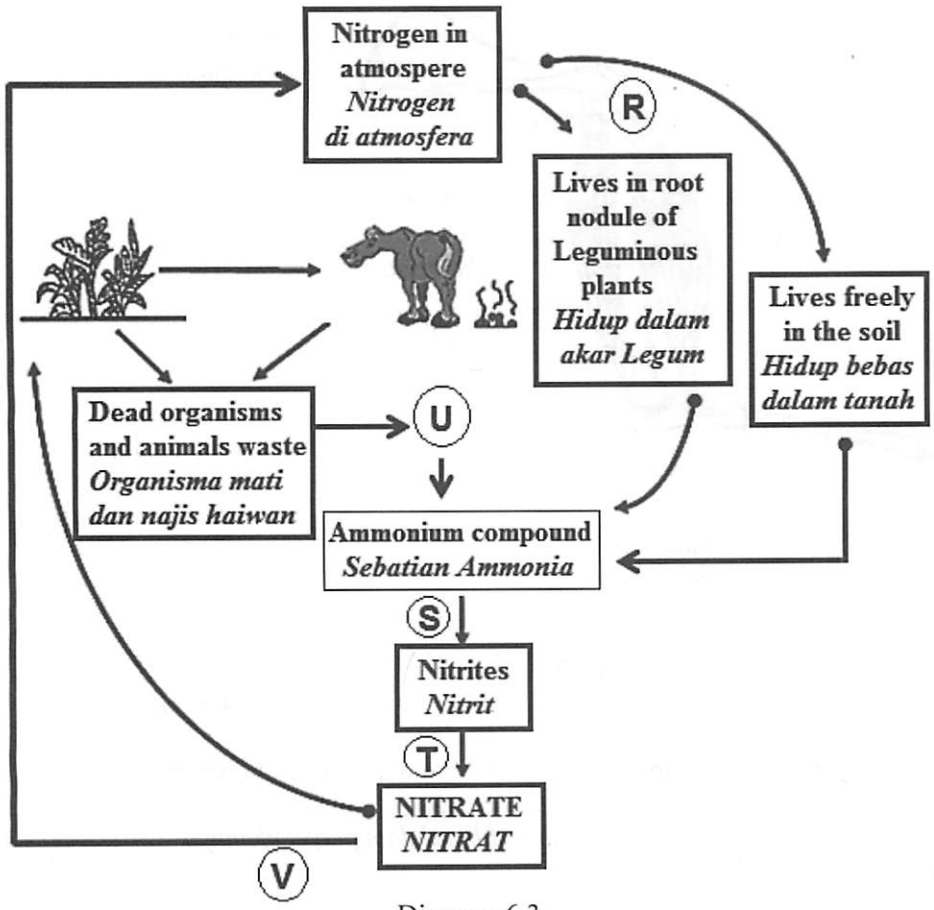


Diagram 6.3
Rajah 6.3

Explain the role of microorganisms R, S, T, U and V in this cycle.
Terangkan peranan mikroorganisma R, S, T, U dan V dalam kitar ini.

[10 *marks*]

7 (a) Movement of the forelimb in human is brought about by a pair of antagonistic muscle. Explain the movement of the forelimb by using Diagram 7.1.
Pergerakan anggota hadapan manusia disebabkan oleh sepasang otot antagonistik. Terangkan pergerakan anggota hadapan dengan menggunakan Rajah 7.1.

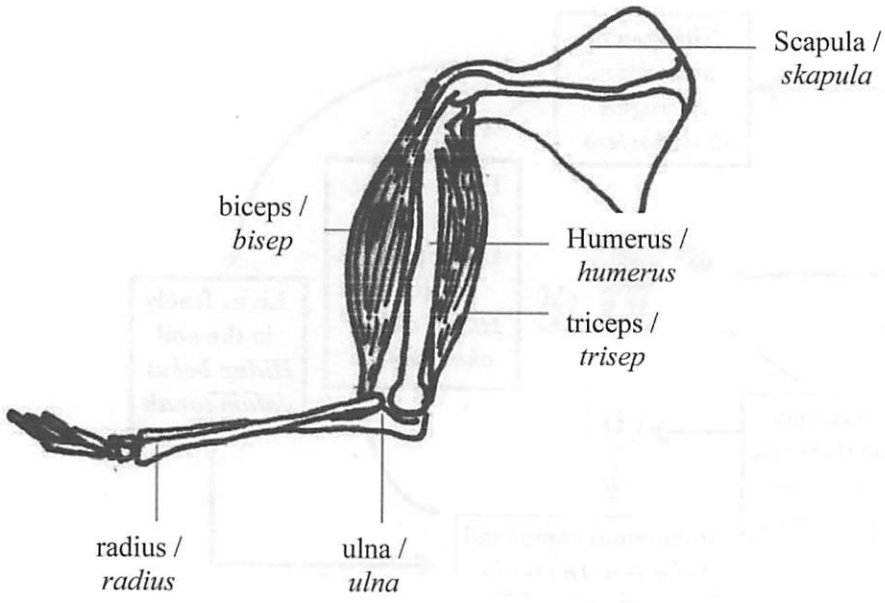
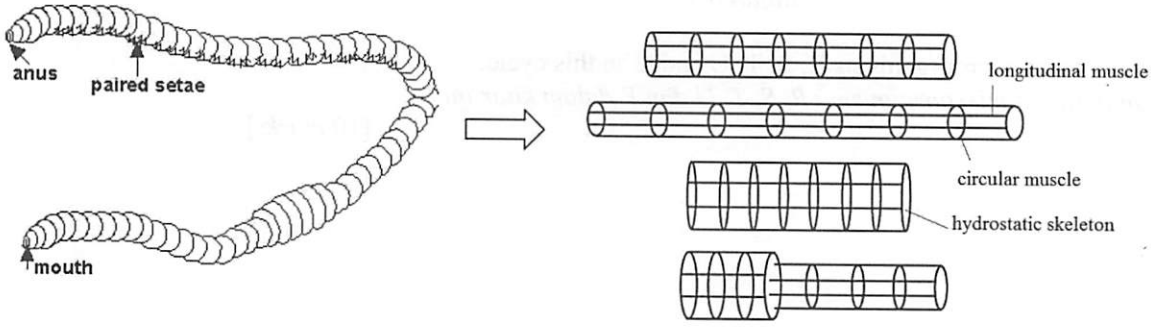


Diagram 7.1 // *Rajah 7.1*

[4 *marks*]

(b) Explain how the structure in the earthworm involve in their movement as shown in Diagram 7.2.
Terangkan bagaimana struktur dalam cacing tanah terlibat dalam pergerakannya seperti ditunjukkan dalam Rajah 7.2



[6 *marks*]

(c) (i) State the problems that could be faced by fish and the bird in support and locomotion
Nyatakan masalah yang dihadapi oleh ikan dan burung dalam sokongan dan pergerakan

[2 *marks*]

(ii) Explain the similarities and differences between the fish and the bird's on the structural adaptation for support system and locomotion.
Terangkan persamaan dan perbezaan di antara ikan dan burung tentang penyesuaian struktur untuk sistem sokongan dan pergerakan

[8 *marks*]

8 (a) Diagram 8 shows the impact of human activities to the quality of natural environment.
Rajah 8 menunjukkan impak aktiviti manusia ke atas kualiti alam semulajadi.

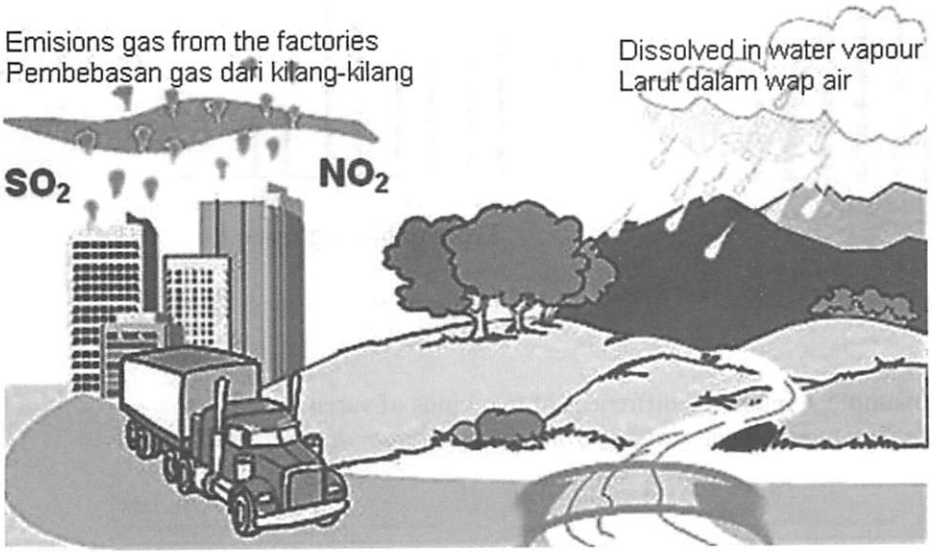


Diagram 8
Rajah 8

State the phenomena shown in Diagram 8. Discuss this phenomenon based on the following aspects:
- the sources
- the effects and
- the ways to overcome

Nyatakan fenomena yang ditunjukkan di Rajah 8. Bincangkan fenomena tersebut berdasarkan kepada aspek-aspek berikut:
- *punca*
- *kesan dan*
- *cara untuk mengatasi*

[10 *marks*]

(b) Explain the concept of sustainable development and their importance in preservation and conservation of tropical rainforest in Malaysia.
Terangkan konsep pembangunan berterusan dan kepentingannya dalam pemeliharaan dan pemuliharaan hutan hujan tropikal di Malaysia.

[10 *marks*]

9.(a)(i) Diagram 9.1 and 9.2 shows the histogram about distribution of genetic variation in human.
Rajah 9.1 dan 9.2 menunjukkan histogram mengenai taburan variasi genetik dalam manusia.

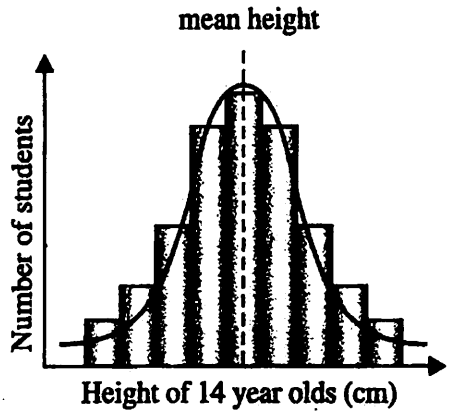


Diagram 9.1
Rajah 9.1

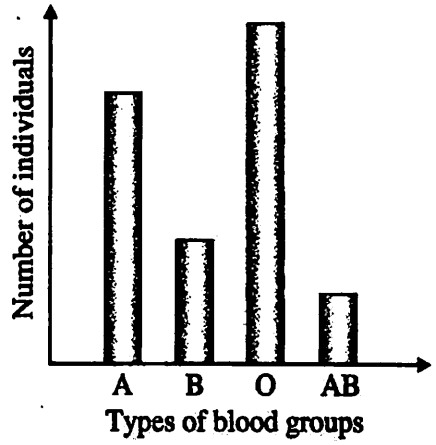


Diagram 9.2
Rajah 9.2

With a suitable example, explain the diffrences of two kinds of variation.
Dengan menggunakan contoh yang sesuai, terangkan perbezaan di antara kedua-dua variasi tersebut.

[7 *marks*]

(ii) What is the importance of variation to organism?
Apakah kepentingan variasi kepada organism?

[3 *marks*]

(b) The variation of ABO blood group determined by three different alleles, but an individual can carry only two of the three alleles.
With schematic diagram, explain the possibilities of the blood group and the genotypes of the offspring if the father's blood group is A and the mother's blood group is B.
Variasi dalam kumpulan darah ABO ditentukan oleh tiga alel yang berbeza, tetapi setiap individu hanya membawa dua daripada tiga alel tersebut.
Dengan gambarajah skema, terangkan kebarangkalian kumpulan darah dan genotip pada anak jika ayahnya mempunyai kumpulan darah A dan ibu kumpulan darah B.

[10 *marks*]

END OF THE QUESTIONS

SULIT NAMA : ..... TINGKATAN : .....
4551/3
Biologi
Kertas 3
Ogos/Sept 2013
1 ½ jam

PENTAKSIRAN SUMATIF 3
SIJIL PELAJARAN MALAYSIA 2013

BIOLOGI
Kertas 3
Satu jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tuliskan nama dan tingkatan anda pada ruang yang disediakan*
2. *Jawab **semua** soalan*
3. *Jawapan anda hendaklah ditulis dalam ruang yang disediakan dalam kertas soalan*
4. *Rajah yang mengiringi soalan dimaksudkan untuk memberi maklumat yang berguna bagi menjawab soalan. Rajah tidak dilukis mengikut skala kecuali dinyatakan.*
5. *Markah yang diperuntukkan bagi setiap soalan dan ceraian soalan ditunjukkan dalam kurungan*
6. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*

Kod Pemeriksa		
Soalan	Markah Penuh	Markah Diperolehi
1	33	
2	Respons 17	
TOTAL		

Kertas soalan ini mengandungi 13 halaman bercetak dan 0 halaman tidak bercetak

TERENGGANU NEGERI ANJUNG ILMU
Dibiayai oleh:
Kerajaan Negeri Terengganu
Dicetak Oleh:
Percetakan Yayasan Islam Terengganu Sdn. Bhd.
Tel: 609-666 8611/6652/8601 Faks: 609-666 0611/0063

MAKLUMAT UNTUK SOALAN

1. Jawab semua soalan.

2. Jawapan anda hendaklah ditulis dalam ruang yang disediakan dalam kertas soalan.

3. Sekiranya anda hendak menukarkan jawapan, batalkan jawapan yang telah dibuat. Kemudian tuliskan jawapan yang baru.

4. Rajah yang mengiringi soalan dimaksudkan untuk memberi maklumat yang berguna bagi menjawab soalan. Rajah tidak dilukis mengikut skala kecuali dinyatakan.

5. Markah yang diperuntukkan bagi setiap soalan dan ceraian soalan ditunjukkan dalam kurungan.

6. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

7. Kertas soalan ini hendaklah diserahkan di akhir peperiksaan.

Pemberian markah:

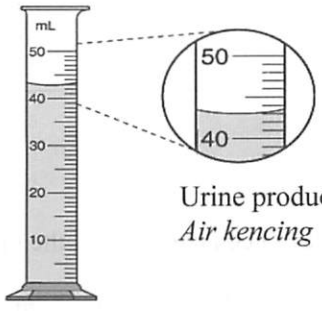
Markah	Penerangan
3	**Cemerlang** : Respons yang paling baik
2	**Memuaskan** : Respons yang sederhana
1	**Lemah** : Respons yang kurang tepat.
0	Tiada respons **atau** respons salah

Question 1
Soalan 1

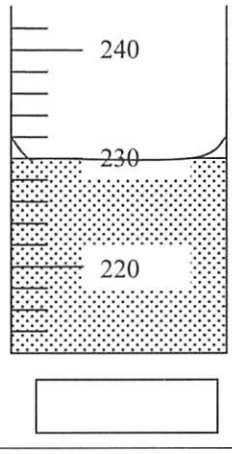
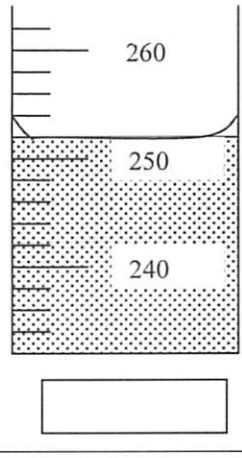
Three groups of same age students were carried out an experiment to investigate how different volumes of water intake on the volume of urine produced. Each group consists of two students. Both students were given same volumes of mineral water to drink and the volumes of urine produced were collected and recorded after half an hour. The results are shown in Table 1. The experiment was repeated two times.

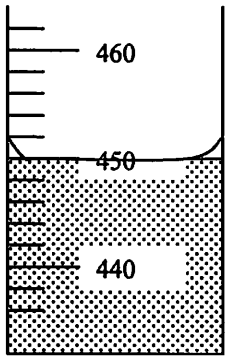
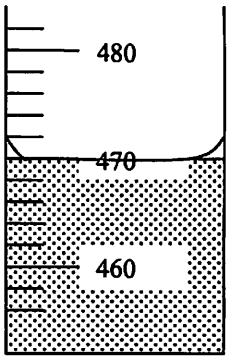
Tiga kumpulan pelajar yang sama umur telah menjalankan suatu eksperimen untuk menyiasat bagaimana perbezaan isipadu pengambilan air terhadap isipadu air kencing yang dihasilkan. Setiap kumpulan terdiri daripada dua orang pelajar. Kedua-dua pelajar telah diberikan isi padu air mineral yang sama untuk diminum dan isi padu air kencing yang dihasilkan dikumpulkan dan direkodkan selepas setengah jam. Keputusan ditunjukkan di dalam Jadual 1. Eksperimen telah diulangi sebanyak dua kali.

Mineral water
Air mineral



Urine produced
Air kencing

Group of student *Kumpulan pelajar*	Volume of water taken (ml) *Isipadu air yang diambil (ml)*	Volume of urine produced by two different student of same age (ml) *Isipadu air kencing yang dihasilkan oleh dua orang pelajar yang berbeza yang sama umur (ml)*	
		First student *Pelajar pertama*	Second student *Pelajar kedua*
A	500ml		

B	1000ml		

Untuk Kegunaan Pemeriksa

(a) Record the volume of urine that have been collected in the measuring cylinder into Table 1
Rekod isipadu air kencing yang dikumpulkan di dalam selinder penyukat ke dalam Jadual 1
[3 marks/*3 markah*]

1 (a)

(b) (i) Based on the results in Table 1, state **two** observations that can be made from this experiment.
Berdasarkan keputusan di dalam Jadual 1, nyatakan dua pemerhatian yang dapat dibuat daripada eksperimen ini

Observation 1/*pemerhatian 1*:

.....

.....

.....

Observation 2/*pemerhatian 2*:

.....

.....

.....
[3 marks/*3 markah*]

1 (b)(i)

(ii) State the inference from the observations in (b) (i).
Nyatakan inferens berdasarkan pemerhatian di (b) (i)

Inference from observation 1/*inferen dari pemerhatian 1*:

.....

.....

.....

Inference from observation 2/*inferen dari pemerhatian 2*:

.....

.....

.....

[3 marks/*3 markah*]

1 (b)(ii)

(c) Complete table 2 based on the experiment.
Berdasarkan eksperimen, lengkapkan jadual 2 di bawah

Variable ***Pembolehubah***	**Particulars to be implemented** ***Cara mengendalikan pembolehubah***
Manipulated/ *manipulasi:*	....
Responding / *bergerakbalas:*	....
Controlled/ *dimalarkan*	....

Table 2/ *Jadual 2*

[3 marks/*3 markah*]

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

.....

.....

.....

[3 marks/*3 markah*]

1 (d)

(e) Construct a table and record all your data collected in the experiment which include the following aspects :
Bina satu jadual untuk merekodkan semua keputusan eksperimen meliputi aspek berikut :

- Student/*Pelajar*
- Volume of water intake/*Isipadu air yang di ambil*
- Volume of urine produced/ *Isipadu air kencing yang dihasilkan*
- Average of urine produced/ *Purata air kencing dihasilkan*

[3 marks/*3 markah*]

1 (e)

(f) Use the graph paper provided on page 9 to answer this question. Using the data in 1 (e), draw a bar chart to show the relationship between the average of volume of urine produced againsts volume of water intake.
Dengan menggunakan kertas graf yang dibekalkan pada muka surat 9 untuk menjawab soalan ini. Dengan menggunakan data di dalam 1 (e), lukis carta bar untuk menunjukkan hubungan purata isipadu air kencing yang terhasil melawan isipadu air yang diambil.

[3 marks/*3 markah*]

1 (f)

(g) Based on bar chart, explain the relationship between the volume of water intake and the average of volume of urine produced?
Berdasarkan carta bar, terangkan hubungan antara isi padu air yang diminum dengan purata isi padu air kencing yang dihasilkan.

.....

.....

.....

.....

[3 marks/*3markah*]

1 (g)

(h) If both students from group A were asked to stay in a room with 10 °C temperature during the experiment, predict the volume of urine produced. Explain your prediction.
Jika kedua-dua pelajar daripada kumpulan A diarahkan untuk berada di dalam bilik yang bersuhu 10 °C semasa eksperimen dijalankan, ramalkan isi padu air kencing yang dihasilkan. Terangkan ramalan anda.

.....

.....

.....

.....

.....

[3 marks/*3markah*]

1 (h)

(i) Based on this experiment, what can you deduce about osmoregulation?
Berdasarkan eksperimen ini, apakah yang dapat anda rumuskan tentang pengomoskawalaturan?

.....

.....

.....

.....

[3 marks/*3markah*]

1 (i)

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

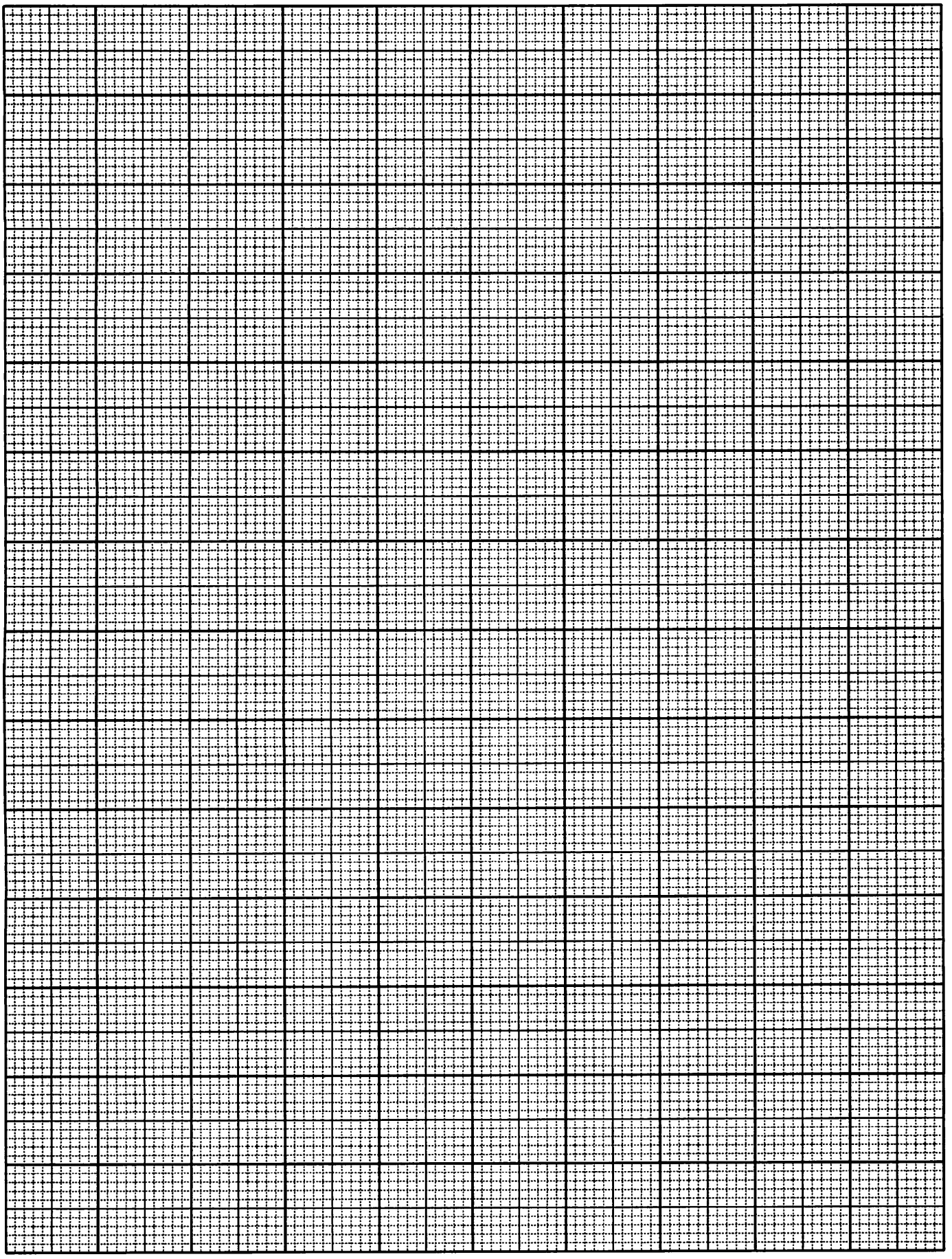
Measuring cylinder *Selinder penyukat*	Stopwatch *Jam randik*	Mineral water *Air mineral*	Mineral bottle *Botol mineral*	Student *Pelajar*	Urine *Air Kencing*

Complete Table 3 by matching each variable with the apparatus and material used in this experiment
Lengkapkan Jadual 3 dengan memadankan setiap pembolehubah dengan radas dan bahan yang digunakan dalam eksperimen ini.

Variable *Pembolehubah*	Apparatus *Radas*	Material *Bahan*
Manipulated *Manipulasi*		
Responding *Bergerak balas*		
Controlled *Dimalarkan*		

[3 marks/*3 markah*]

1 (j)



Question 2
Soalan 2

Exhalation is a process of breathing mechanism whereby a person will breathe in air and give out carbon dioxide gas. The amount of carbon dioxide content produced depend on different vigorous activity.
Hembus nafas adalah satu proses mekanisma pernafasan di mana seseorang akan menyedut udara dan mengeluarkan gas karbon dioksida. Kandungan karbon dioksida terhasil bergantung kepada aktiviti cergas yang pelbagai.

A group of student carried out an experiment in the laboratory by running on the spot with different duration and their exhaled air is collected to analyse percentage of carbon dioxide.
Sekumpulan pelajar menjalankan eksperiment dalam makmal dengan berlari setempat dengan tempoh masa yang berlainan dan udara hembusan dikumpulkan untuk menganalisa peratus karbon dioksida.

Based on the above information, plan a laboratory experiment to study the effect of running on the spot with different duration on the percentage of carbon dioxide gas in exhaled air.
Berdasarkan maklumat di atas, rancang satu eksperimen dalam makmal untuk mengkaji kesan berlari setempat dalam tempoh masa berlainan ke atas peratus gas karbon dioksida dalam udara hembusan.

The planning of your experiment must include the following aspects
Perancangan eksperimen anda hendaklah mengandungi aspek-aspek berikut

Problem statement
Pernyataan masalah

Hypothesis
Hipotesis

Variables
Pembolehubah

List of apparatus and materials
Senarai radas dan bahan

Experimental procedure
Prosedur eksperimen

Presentation of data
Persembahan data

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

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

SPACE FOR THE ANSWER

Part ..... **Question Number.....**

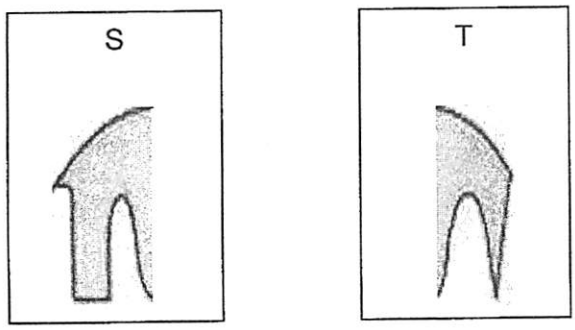
TRIAL 2013
SCHEME BIOLOGY PAPER 1

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

Marking Scheme

Paper 2 (Section A)

NUM	SCORING CRITERIA	MARKS	
1(a)	**Able to match correctly,** *Answer:* 1--- B 2--- A 3--- D 4--- C	 All / 3 / 2 /	 3m 2m 1m
1(b) (i)	**Able to name system and two organs** *Answer:* System: reproductive system *Organ : testis/ penis*	 1 1	 2m
1(b) (ii)	**Able to explain the adaptation** *Suggested answer:* F1: numerous of mitochondria E1 :provide energy to move the tail F2: have a long tail E2: easy to swim reach an ovum *Any F and E*	 F1/ E1/ Or F2/ E2/	 2m
1(c)	**Able to explain without mitochondria** *Suggested answer:* *F : sperm cannot get energy* *E1: cannot swim to reach ovum* *E2: fertilisation cannot occur*	 F and any E1/ E2	 1m 1m
1(d)	**Able to explain** necessity of cell specialisation *Suggested answer:* E1: multicellular organisms are consist of many cells but unicellular made up the body one cell only E2:multicellular need specialised cells to carry out different functions to body but unicellular can do any life function its own one cell E3: the cell of multicellular very far from environment and its hard for diffusion, but unicellur cell nearest to environment and diffusion very easy/fast.	 1 1 1	 3m
	TOTAL	**12 marks**	

NO.	MARKING CRITERIA	MARKS	
2.(a)(i)	*Able to name P, Q and R* **Sample answer :** P : Lactose Q: Lactase R: Lactase-Lactose-complex	**Note:** 3 √ 1-2 √	 2m 1m
2.(a)(ii)	Able to draw the diagram in the spaces S and T provided in Diagram 2.1 to complete the mechanism of the enzyme reaction. **Sample answer :** 	1+1	2m
2(b)(i)	*Able to explain **one** characteristic of the enzyme based on diagram 2.1* **Sample answer:** P1 : Enzyme is highly specific, can only catalyse one kind of substrate // Enzyme has specific site called active site to bind to specific substrate (Act specifically) P2 : Enzyme is not destroyed by the reactions they catalyse // Can be reused // Remain unchanged at the end of the reaction	1 1	2m
2(b)(ii)	*Able describe the enzyme action based on this hypothesis* **Sample answer:** P1 : The substrate molecule represents the `key ' and the enzyme molecule represents the `lock' P2 : The substrate molecule binds to the active site P3 : to form an enzyme-substrate complex P4 : The enzyme catalyses the substrate to form products, (then the product leaves the active site) P5 : The enzyme molecule is now free to bind to more substrate molecules (Any 3)	1 1 1 1 1	3m

2(c)	*Able to explain the enzymes action at Q.* **Sample answer:** P1: At Q, the enzyme reaction is at a maximum rate //the rate of reaction will not increase further (and become constant) P2: At Q, the concentration of substrate is high//access of substrate molecules. P3: The active site of enzyme molecules are filled/fully occupied by the substrate molecules//The enzyme molecules is said to be saturated. P4:The concentration of enzymes become a limiting factor. (Any 3)	1 1 1 1	3m
	TOTAL		**12 MARKS**

NUM	SCORING CRITERIA	MARKS	
3(a) (i)	Able to label to name the structure *Suggested answer:* Villus	1	1
3(a) (ii)	Able to state how the structure is adapted to its function *Suggested answer:* P1: the epithelial lining is only one cell thick P2: epithelial cell have a lining of microscopic projection called microvillus P3: each villus has a network of blood capillaries **Any 2**	 1 1 1	 2
3(b)	Able to state the function of X and Y *Suggested answer:* X: absorb fatty acid and glycerol/vitamin A,D,E,K Y: absorbed glucose/amino acids/mineral/vitamin B.C	 1 1	 2
3(c)	Able to explain the function of liver in assimilation *Suggested answer:* P1:act as check point P2: which control the amount of nutrients released into blood circulatory system	 1 1	 2
3(d)	Able to explain the assimilation of nutrient P *Answer* F - nutrient P is glucose P1 - which is converted into glycogen and stored in the liver P2 - when there is lack of blood glucose level, stored glycogen is converted back to glucose P3 - glucose are transported to the cells to produce energy **Any 2**	 1 1 1 1	 2
3(e)	Able to explain why assimilation of lipids do not occur in liver *Suggested answer:* F: Lipids are not transported to the liver P1: Fatty acids an glycerols/lipids are absorbed into lacteal not into blood capillaries P2: from lacteal lipids is transported through lymphatic system to blood circulatory system P3:excess lipid stored in adipose tissue **Any 3**	 1 1 1 1	 3
	Total		12

NUM	SCORING CRITERIA	MARKS	
4(a)(i)	Sample answer : - Lymph	1	1
4(a)(ii)	Sample answer : X does not have - erythrocyte - protein plasma - haemoglobin *Any two*	 1 1 1	 2
4(b)	*Suggested answer:* - fatty acid and glycerol diffuse into lacteal of villi - transport by lymphatic system via lymph nodes - back to blood circulatory system via left and right subclavian vein (and then transport to body cells) *Any two*	 1 1 1	 2
4(c)(i)	*Answer:* X: Artificial active immunity Y : Artificial passive immunity	 1 1	 2
4(c)(ii)	*Suggested answer* X : To increase the production of antibodies as a prevention against future infection . Y : To supply enough antibodies up to the level of immunity and able to destroy pathogens quickly	 1 1	 2
4(c)(iii)	*Suggested answer* Individual X: Long lasting or permanent; Slow response Individual Y: Short lasting or temporary; Immediate response	 1 1	 2
4(d)	*Suggested answer* - because HIV viruses destroy the white blood cells / lymphocytes	1	1
		Total	**12**

Num	Scoring Criteria	Marks	
		Marks	Remarks
5(a)(i)	Able to name the mechanism involve to regulate body temperature *Answer:* Negative Feedback Mechanism	 1	 1
5(a)(ii)	Able to state the way organ X and gland Y response to regulate body temperature *Answer:* Organ X : Physical Gland Y : Metabolic process	 1 1	 2
5(b)	Able to explain the roles of the erector muscle, blood capillary and sweat gland in maintaining the body temperature on a hot day. *Suggested answer* F1: erector muscle relax P1: hair follicle lie down to trap thin air F2: blood capillary expand / diameter increase / vasodilation P2: more heat release through radiation F3: sweat gland active / secrete more sweat P3: evaporation of sweat release heat	 1 1 1 1 1 1	 6
5(c)	Able to explain how gland Y helps to regulate the student's body temperature. *Suggested answer:* P1: hypothalamus stimulate adrenal gland / gland Y P2: adrenal gland / gland Y secrete adrenaline P3: to increase the metabolic rate P4: more heat produce P5: body temperature increase	 1 1 1 1 1	 Max 3
		Total	**12**

Section B

<table>
<tr><th>NUM</th><th>SCORING CRITERIA</th><th colspan="2">MARKS</th></tr>
<tr><td>6(a)</td><td>Able to state the differences between microorganisms P and Q.
<table>
<tr><th></th><th>P</th><th>Q</th></tr>
<tr><td>N</td><td>P is Bacteria</td><td>Q is Virus</td></tr>
<tr><td>D1</td><td>Classified into kingdom of monera</td><td>Cannot be classified in any of the kingdom</td></tr>
<tr><td>D2</td><td>P is unicellular organisms (which have a basic cell structure)</td><td>Is not living cell (cannot survive/ reproduce on its own outside the host)</td></tr>
<tr><td>D3</td><td>Composed of DNA</td><td>Composed of DNA or RNA</td></tr>
<tr><td>D4</td><td>Exist in the form of spherical / rod-shaped / spiral</td><td>Exist as (chemical) crystals (outside the host cell)</td></tr>
</table></td><td>1
1
1
1
1</td><td>Max 4</td></tr>
<tr><td>6(b)</td><td>Able to name the disease faced by Y.
Answer: Tuberculosis / TB

Able to explain how this disease infected Y.
<u>Sample answers</u>:
F Through droplet transmission
E1 When X sneeze / cough / speak / spit
E2 the droplets from the mouth / nose
E3 are released and float in the air
E4 These droplets breathed in by Y
E5 If droplets contain (TB) bacteria cause Y to fall ill</td><td>1

1
1
1
1
1
1</td><td>1

Max 5</td></tr>
<tr><td>6(c)</td><td>Able to explain the role of microorganisms R, S, T, U, V and W in this cycle
<u>Sample answers</u>:
E1 R / <u>Nitrogen fixing bacteria</u> / Azotobacteria sp. / Nostoc sp. / Clostridium sp /Rhizobium sp.
E2 convert nitrogen into ammonium compound
E3 S / Nitrifying bacteria / Nitrosomonas sp convert ammonium compounds into nitrites
E4 T / Nitrifying bacteria / Nitrobacter sp. convert nitrites into nitrates
E5 (Nitrate) are absorbed by plants to make protein
E6 When animals eats the plants, the protein is transferred to the animals
E7 Waste material / faeces / urea / excretory nitrogenous plants
E8 When animals / plants die
E9 are decomposed by U / decaying bacteria / saprophytic bacteria / fungi
E10 Break them down to ammonium compound in the soil
E11 V / Denitrifying bacteria converts nitrates into nitrogen</td><td>1
1
1
1
1
1
1
1
1
1
1</td><td>Max 10</td></tr>
<tr><td></td><td>TOTAL</td><td colspan="2">20 M</td></tr>
</table>

No	Mark Scheme	Sub Mark	Total Mark
7(a)	*Able to explain the movement of the forelimb in human* *Suggested answer* F1: forelimb/arm being bent E1:when the biceps muscle contract, the triceps muscle relaxes F2: Forelimb/arm being straight E2: when the triceps muscle contract, the biceps muscle relaxes	 1 1 1 1	 4
7(b)	*Able to explain how the structure in the earthworm involve in their movement as shown in the diagram.* *Suggested answer* F1: hydrostatic skeleton E1: fluid in the body cavity helps the earthworm to move F2: muscle at the body wall are longitudinal and circular muscle / antagonistic muscle E2: contraction of circular muscles cause segment to extend while the longitudinal muscles relax E3: contraction of longitudinal muscles cause segment to shorten while the circular muscles relax F3: chaetae E3:secure the shorted segments in the posterior to the ground while the anterior segments extended owing to contractions of the circular muscles *Maximum 6*	 1 1 1 1 1 1 1	 6
7(c)	*Able to state the problems that could be faced by fish and the bird in support and locomotion* *Answer:* Fish – Water resistance Bird – Air resistance *Able to explain the similarities and differences between the fish and the bird's on the structural adaptation for support system and locomotion.* *Suggested answer* S1: both fish and bird has antagonistic muscle E1: able the organism move in the habitat S2: both fish and bird has endoskeleton E2: able to give support to organism D1: fish has streamlined shapes/ skin covered with skin but the shape of bird / body covered with furs E3: to overcomes the problem of water resistant in fish and air resistant in bird D2: fish has myotome arranged in segments on both side of left and right side of the body but the bird has pectoralis major and minor at their limb E4: for fish to swim and bird to fly (in their habitat) D3: fish has unstable problem in water while swimming / Yawing / Pitching / Rolling but bird has unstable problem while flying/ lifting force E5: instability of fish is overcome by fin but instability of bird is overcome by the shape of an aerofoil wings maximum	 1 1 1 1 1 1 1 1 1 1 1 1 	 2 10
		TOTAL	**20**

No	Mark Scheme	Mark	Total
8(a)	**Able to explain the differences between the two human activities** Criteria 1. State the types of phenomena 2. C: the causes 3. E: the effects 4. S: ways to overcome *Sample answers* F1: (The phenomenon is) acid rain **The causes:** C1: Combustion/ Burning of fossil fuels in power stations/ factories/ motor vehicles C2: release sulphur dioxide/ SO_2 and oxides of nitrogen/ NO and NO_2 C3: Form sulphuric acid and nitric acid when combine with water vapour C4: Fall to Earth as acid rain/ snow/ hail/ fog/ frost/ dew **The effects** *Agriculture:* E1: Leaching of minerals// the soil become acidic *Aquatic ecosystem*: E2: Increase acidity in the aquatic ecosystem// kill phytoplankton// destroyed photosynthetic tissues// accumulate insoluble aluminium ions in lakes and rivers which kill aquatic organisms *Health*: E3: Acidic soil releases ions of certain heavy metals/ contaminate the supply of drinking water// irritate the lungs/ make breathing difficult/ asthma/ bronchitis. E4: Corrode metal railing/ bridges/ damage buildings/ statues/ automobiles/ structures made of stone/ metal/ historic buildings **The ways to overcome / solutions** S1: Use scrubbers (to clean up emissions from power stations and industrial plants) S2: Use catalytic converters (to clean up emissions from vehicle exhausts) Must have F, C, E and S (at least one point) Any 10	1 1 1 1 1 1 1 1 1 1 1 1	10m

8(b)	**Able to explain the importance of sustainable management of tropical rainforest.**		
	Sample answers F: (Sustainable development refers to) the measures undertaken to ensure that human activity optimally utilize Earth's natural resources such that they can be replenished naturally//suitable explanation	1	
	F1: Replanting trees in areas that have been logged// reforestation	1	
	E1: to keep the ecosystems in their natural state (which provides aesthetic values for humans) // preserve natural resources for outdoor/ recreational activities// eco-tourism // reduce stress// promote healthy life style	1	
	E2: to maintain soil fertility	1	
	E3: to prevent flood/ soil erosion / landslide/ (muddy) flood/ (flash) flood	1	
	E4: to avoid species extinction// to prevent extinction of flora and fauna/ organisms/ species	1	
	E5 : As an economic resource// source of raw materials for construction industry / piling / furniture / boats / houses/ production of charcoal / tannin / food / other suitable example // provide foods to human // resources for study / education / research	1	
	F2: Selective logging		
	E5: to maintain a balanced ecosystem// to allow maximum interaction among the living organisms/ biotic factors (in the ecosystem) and interaction between biotic and abiotic factors	1	
	E6: to maintain major sources of human food/ e.g: ulam/ ferns/ meats/ honey// sources of medicinal plant/ eg: herbs	1	
	E7: to sustain food web/ food chain in the ecosystem	1	
	E8: to prevent disruption of natural cycle of water/ carbon/ balance between photosynthesis and respiration// balance oxygen and CO_2 in the atmosphere // provide O_2 // reduce CO_2	1	
	E9: to decrease the carbon dioxide level in the atmosphere // to reduce the greenhouse effect/ global warming	1	
		1	

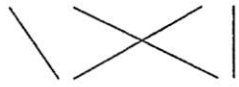
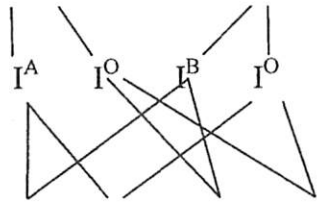
	E10: to maintain the biodiversity of the forest// maintaining / increasing biodiversity / complexity / variety of organisms / species / flora and fauna	1	
	E11: to avoid lost of wildlife/ potential resources	1	
	E12: to avoid loss of watershed areas // provide natural water catchment area	1	
	E13: maintaining (normal) weather (patterns) by minimize climatic change / drought / harsh climate / maintain temperature	1	10m
	E14 : As a site for breeding / feeding of flora and fauna / serving as valuable nursery area for organisms	1	
	Must have F and any 10		
	TOTAL		**20M**

Num	SCORING CRITERIA	Mark	Remark
9(a)	Able to (i) State the example of continuous variation and discontinuous variation and the difference of continuous variation and discontinuous variation Sample answer: Example of continuous variation: Height or weight Example of discontinuous variation: ABO blood group	1 1	
	Differences		

Continuous variation	Discontinuous variation	Mark	Remark
Graf distribution shows a normal distribution	Graf distribution shows a discrete distribution	1	
The characters are quantitative / can be measured and graded (from one extreme to the other)	The characters are qualitative / cannot be measured and graded (from one extreme to the other)	1	
Exhibits a spectrum of phenotypes with intermediate character	Exhibits a few distinctive phenotypes with no intermediate character	1	
Influenced by environmental factors	Is not Influenced by environmental factors	1	
Two or more genes control the same character	A single genes determines the differences in the traits of the character	1	
The phenotype is usually controlled by many pair of alleles	The phenotype is controlled by a pair of alleles	1	Max 7

	(ii) Able to state the importance of variation to organism Sample answer: P1: variation provided better adaptation for organism to survive in the changing environment P2: variation are essential to the survival of species / to survive more successfully P3; variation be able to organism explore a new habitat P4: to ensure organism survival from predator Any 3	1 1 1 1 Total	3 10

Num	SCORING CRITERIA	Mark	Remark
9(b)	Able to explain the possibilities of the blood group and the genotypes of the offspring when the father's blood group is A and the mother's blood group is B. Sample answer: There are four possibilities; (a) Parent's genotype: $I^A I^A$ X $I^B I^B$ Gamete I^A I^B Genotype F1 $I^A I^B$ Phenotype F1 All offspring have Blood group AB (b) Parent's genotype: $I^A I^A$ X $I^B I^O$ Gamete I^A I^B I^O Genotype F1 $I^A I^B$ $I^A I^O$ Phenotype F1 50% of offspring have blood group AB and 50% have blood group A	1 1 1 1 1 1 1	3 3

	(c) Parent's genotype: $I^A I^O$ X $I^B I^B$ Gamete I^A I^O I^B  Genotype F1 $I^A I^B$ $I^B I^O$ Phenotype F1 50% of offspring have blood group AB and 50% have blood group B	1 1 1	3
	(d) Parent's genotype: $I^A I^O$ X $I^B I^O$ Gamete I^A I^O I^B I^O  Genotype F1 $I^A I^B$ $I^A I^O$ $I^B I^O$ $I^O I^O$ Phenotype F1 AB A B O 25% chance that offspring has blood group AB, A, B, O	1 1 1	3 Max 10

SUGGESTED ANSWER FOR 4551/3

QUESTION 1

<table>
<tr><th>ITEM NO</th><th>SCORE</th><th>EXPLANATION</th><th>REMARKS</th></tr>
<tr><td>(a)</td><td></td><td>KB0603 – Measuring using numbers</td><td></td></tr>
<tr><td></td><td>3</td><td>Able to record all data correctly
Sample answer :
<table>
<tr><td rowspan="2">Volume of water intake (ml)</td><td colspan="2">Volume of urine produced (ml)</td></tr>
<tr><td>First time</td><td>Second time</td></tr>
<tr><td>500 ml</td><td>230</td><td>252</td></tr>
<tr><td>1000 ml</td><td>450</td><td>470</td></tr>
</table></td><td></td></tr>
<tr><td></td><td>2</td><td>Able to record 3 data correctly</td><td></td></tr>
<tr><td></td><td>1</td><td>Able to record 2 data correctly</td><td></td></tr>
<tr><td></td><td>0</td><td>Not able to give any response or wrong response</td><td></td></tr>
<tr><td rowspan="3">(b) (i)</td><td></td><td>KB0601 – Observing</td><td rowspan="3">Accepted : Any suitable answer</td></tr>
<tr><td>3</td><td>Able to state any two observations correctly
Sample answer :
1. When 500ml mineral water were intake by two students, first student produces urine about 230ml and the second student produces urine about 252ml.
2. When 1000ml mineral water were intake by two students, first student produces urine about 450ml and second student produces urine about 470ml.</td></tr>
<tr><td>2</td><td>Able to state any one of the above observation correctly and one idea of observation
Sample answer
1. When group of students A drinks less mineral water, they produced less urine.
2. When group of students B drinks more mineral water, they produced more urine</td></tr>
</table>

	1	Able to state two ideas of the above observations correctly Sample answer 1. Group A produced less urine 2. Group B produced more urine	
	0	Not able to give any response or wrong response	
(b) (ii)		**KB0604 – Making inference**	
	3	Able to state two possible inference for each observation based on the following: P1: More / less water reabsorbed from the tubule of kidney into blood capillary P2: High/ low blood osmotic pressure Sample answer 1. Group A produces less urine because more water is reabsorbed from the tubule of kidney into blood capillary due to high blood osmotic pressure 2. Group B produces more urine because less water is reabsorbed from the tubule of kidney into blood capillary due to low osmotic pressure	
	2	Able to state any one possible inference for each observation and one inference that less accurate Sample answer 1. Group A produce less urine because more water is reabsorbed from the tubule of kidney into blood capillary //due to high blood osmotic pressure 2. Group B produce more urine because less water is reabsorbed from the tubule of kidney into blood capillary // due to low blood osmotic pressure	
	1	Able to state two inferences but less accurate Sample answer 1. Group A kidney's tubule reabsorbs more water 2. Group B have low osmotic pressure	

<table>
<tr><td></td><td>0</td><td>Not able to give any response or wrong response</td><td></td></tr>
<tr><td>(c)</td><td></td><td>KB0610 – Controlling variables</td><td></td></tr>
<tr><td></td><td>3</td><td>Able to state any 5-6 items from the table
<table>
<tr><th>Variable</th><th>Particular to be implemented</th></tr>
<tr><td>Manipulated variable
Volume of water intake</td><td>Used different volume of water intake by each group of student such as 500ml and 1000ml</td></tr>
<tr><td>Responding variable
Volume of urine produce</td><td>Record the volume of urine produce by using a measuring cylinder</td></tr>
<tr><td>Constant variable
Time (before collecting urine)
Same age student</td><td>Fixed the time about 30 minutes before collecting the urine produced by each group of student

// carry out by the same age of student</td></tr>
</table></td><td>Constant variable : Accepted any suitable answer</td></tr>
<tr><td></td><td>2</td><td>Able to state any 3-4 items from the above</td><td></td></tr>
<tr><td></td><td>1</td><td>Able to state any 2 items from the above</td><td></td></tr>
<tr><td></td><td>0</td><td>Not able to give any response or wrong response</td><td></td></tr>
<tr><td>(d)</td><td></td><td>KB0611 – Stating a hypothesis</td><td></td></tr>
</table>

<table>
<tr><td></td><td>3</td><td>Able to write a complete hypothesis statement showing the relationship between manipulated variable and responding variable correctly.
P1 = manipulated variable
P2 = responding variable
H = Link/ relationship

Sample answer :
1. The higher the volume of water intake, the higher the volume of urine produced/ output.
2. If more / higher volume of water intake, so more / higher volume of urine produced/ output</td><td>P1 – volume of water intake

P2 – volume of urine produced

H – relationship

* wrong hypothesis was accepted*</td></tr>
<tr><td></td><td>2</td><td>Able to write any two from the above
P1 and P2 // P1 and H // P2 and H
Sample answer :
1. The different volume of water intake, the different volume of urine produced
2. The volume of water intake affect the volume of urine produced</td><td></td></tr>
<tr><td></td><td>1</td><td>Able to write any one from the above
Sample answer :
1. The volume of water intake affect urine produced</td><td></td></tr>
<tr><td></td><td>0</td><td>Not able to give response or wrong response</td><td></td></tr>
<tr><td></td><td></td><td>KB0606 – Communicating</td><td></td></tr>
<tr><td>(e)</td><td>3</td><td>Able to prepare a table and shows the following :
H – Heading in the table are labeled with correct units
D – All data are correct
P – All the students are correct
<table>
<tr><th rowspan="2">Group of student</th><th rowspan="2">Volume of water intake (ml)</th><th colspan="2">Volume of urine produce (ml)</th><th rowspan="2">Average of urine produce (ml)</th></tr>
<tr><th>first</th><th>second</th></tr>
<tr><td>A</td><td>500</td><td>230</td><td>252</td><td>241</td></tr>
<tr><td>B</td><td>1000</td><td>450</td><td>470</td><td>460</td></tr>
</table></td><td></td></tr>
</table>

	2	Able to prepare a table and show the following 1. H and D // D and P // H and P	
	1	Able to prepare a table and show the following 1. Either H or D or P	
(f)		**KB0607 – Using spatial and time relationship**	
	3	Able to plot a bar chart with the following criteria: P – all axis with uniform scale and correct units T – all point is transferred correctly B – all bar chart ware plotted	
	2	Able to give any 2 criteria correctly	
	1	Able to give any 1 criteria correctly	
	0	Not able to give response or wrong response	
(g)		**KB0608 – Interpreting Data**	
	3	Able to explain the relationship between the volume of water intake and the average of volume of urine produced Sample answer: E1 – If more volume of water intake, so more average of volume of urine is produced E2 – because low blood osmotic pressure E3 – causing less water is reabsorbed from the tubule of the kidney into blood capillary	
	2	Able to write any two from the above E1 and E2 // E1 and E3 // E2 and E3	
	1	Able to write any one from the above E1 // E2 //E3	
	0	Not able to give response or wrong response	
(h)		**KB0605 – Predicting**	

	3	Able to predict the Sample answer : E1 – volume of urine produced increased / more than 460ml E2 – because temperature is low/reduce E3 - causing less water is reabsorbed from the tubule of the kidney into blood capillary//due to less sweat is produced	
	2	Able to state any two from the above	
	1	Able to state any one from the above	
	0	Not able to give response or wrong response	
(h)		**KB0609 – Defining by operation**	
	3	Able to describe the concept of osmoregulation correctly based on the observation Sample answer Osmoregulation is E1 – a process of maintaining blood osmotic pressure of the four student/student of group A and B E2 – which can be determined by the volume of urine produced by both student. E3 – Volume of urine produced is affected by the volume of water intake.	
	2	Able to state any two from the above	
	1	Able to state any one from the above	
	0	Not able to give response or wrong response	
(i)		**KB0602 – Classifying**	

<table>
<tr><td></td><td>3</td><td>Able to classify correctly the list of apparatus and materials according to the variables
Sample answer :
<table><tr><td>Variable
Pembolehubah</td><td>Apparatus
Radas</td><td>Material
Bahan</td></tr><tr><td>Manipulated
Manipulasi</td><td>Mineral bottle</td><td>Mineral water</td></tr><tr><td>Responding
Bergerak balas</td><td>Measuring cylinder</td><td>Urine</td></tr><tr><td>Controlled
Dimalarkan</td><td>Stopwatch</td><td>Student</td></tr></table></td><td></td></tr>
<tr><td></td><td>2</td><td>Able to classify the list of apparatus and materials according to any two variables</td><td></td></tr>
<tr><td rowspan="2"></td><td>1</td><td>Able to state the materials in any one class completely</td><td rowspan="2"></td></tr>
<tr><td>0</td><td>Not able to give response or wrong response</td></tr>
</table>

Suggested answer for Question 2
KB061201 – (Problem statement)

Question	Score	Explanation	Remarks
2 (i)	3	Able to state the problem statement correctly : P1 : vigorous activities //different duration of running on the spot P2 : Percentage of carbon dioxide gas in exhaled air / length of air column after being treated with potassium hydroxide solution. H : Question form Sample answer: 1. Does the different duration of running on the spot affect percentage of carbon dioxide gas in exhaled air / length of air column after being treated with potassium hydroxide solution ? 2. How do vigorous activities affect the percentage of carbon dioxide gas in exhaled air / length of air column after being treated with potassium hydroxide solution?	

		3. What is the effect of vigorous activities against percentage of carbon dioxide gas in exhaled air?	
	2	Able to state a problem statement less accurately. Sample answer: 1. What activity affects the carbon dioxide gas in exhaled air 2. Can running on the spot affects carbon dioxide gas in exhaled air? 3. What is the effect of running on the percentage of carbon dioxide gas in exhaled air?	
	1	Able to state a problem statement at idea level Sample answer: 1. Exhalation gives out carbon dioxide gas. 2. Carbon dioxide content depend on vigorous activity / different duration of activity.	
	0	No response or wrong response	

KB061202 (KB061203 – Making Hypothesis)

Question	Score	Explanation	Remarks

2 (iii)	3	Able to state the hypothesis based on the following aspects:
		P1 = Manipulated variable = vigorous activity//different duration of running on the spot
		P2 = Responding variable = percentage of carbon dioxide gas in exhaled air // length of air column after being treated with potassium hydroxide solution.
		R = Relationship / Link
		Sample answer :
		1. As duration of running on the spot increases, the higher the percentage of carbon dioxide gas in exhaled air / length of air column after being treated with potassium hydroxide solution. (vice versa)
		2. As more vigorous of an activity, the higher the percentage of carbon dioxide gas in exhaled air / length of air column after being treated with potassium hydroxide solution. (vice versa)
			Wrong hypothesis accepted as long there is P1,P2

	2	Able to write a hypothesis statement less accurately Sample answer:	

		1. As activity increases, the carbon dioxide also increase. 2. Different activities affect different percentage of carbon dioxide gas	
	1	Able to state a hypothesis at idea level Sample answer: 1. Carbon dioxide produced in exhaled air	
	0	No response or wrong response	

VARIABLE 2(iv)		Able to state all the three variables correctly Sample answers : Manipulated variable = vigorous activity //different duration of running on the spot Responding variable = percentage of carbon dioxide gas in exhaled air // length of air column after being treated with potassium hydroxide solution. Constant variable = same student / type of J-tube	

KB061205 - (Apparatus and materials)

Question	Score	Explanation	Remarks
2(v)	3	Able to list out all the important apparatus and materials correctly. Sample answers: Apparatus: J-tube, boiling tubes, rubber tubing, ruler , stopwatch Materials: Student, water basin, potassium hydroxide solution, exhaled air, distilled water	
	2	Able to list 3 apparatus and 3 materials correctly	
	1	Able to list 2 apparatus and 2 materials correctly	
	0	No response or incorrect response	

KB061204 (Experimental Procedure)

Question	Score	Explanation	Remarks
2(vii)	3	Able to describe **all** the steps of the experiment correctly Note: K1: preparation of materials and apparatus K2: operating the constant variable	

		K3: operating responding variable K4: operating manipulated variable K5: Step to increase reliability of result accurately/precaution Sample answers 1. J-tube is unscrew clockwise to the end. 2. The open end of J-tube is lowered into a basin of water 3. 5cm of water is drawn into the J-tube by turning anticlockwise. The screw is turned clockwise again to expel some water. The J-tube is placed into the basin. 4. When student is resting for 0 minute, a sample of exhaled air is collected through rubber tubing which is inserted into a boiling tube filled with water 5. Then the open end of J-tube is placed into the boiling tube containing exhaled air 6. The screw is turned anticlockwise to draw some exhaled air into the capillary tube. 7. Then the open end of J-tube is dip into potassium hydroxide solution. 8. The screw is turned clockwise and anticlockwise to allow carbon dioxide being absorb by potassium hydroxide solution. 9. Record the length of air column in J-tube by using a ruler after being absorbed by potassium hydroxide solution. Avoid touching the J-tube 10. Repeat Step 4 until 9 to the same student by running on the spot for 1 minute, 2 minutes and 3 minutes . 11. All results are recorded in a Table.	To get K1, must include at least 4K1 K1 K1 K1 /K2 K1 K1 K1 K1 K1 K3 K5 K2/ K4 K1
	3	All the 5 K's	
	2	Any 3-4 K's	
	1	Any 1-2 K's	
	0	No response or incorrect response	

KB061206 (Presentation of Data)

Question	Score	Explanation	Remarks

<table>
<tr>
<td>Presentation of Data
2(viii)</td>
<td>2</td>
<td>Able to present all the data with units correctly
Based on :
P1: Title with correct units
P2: Sample for vigorous activity
Sample answer:
<table>
<tr><th>(Types of) vigorous activity//Duration of running on the spot</th><th>Length of air column after being treated with potassium hydroxide solution (cm)</th><th>Percentage of carbon dioxide in capillary tube /J-tube (%)</th></tr>
<tr><td>Resting for 0 minute</td><td></td><td></td></tr>
<tr><td>Running on the spot for 1 minute</td><td></td><td></td></tr>
<tr><td>Running on the spot for 2 minutes</td><td></td><td></td></tr>
<tr><td>Running on the spot for 3 minutes</td><td></td><td></td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Any P1 or P2</td>
<td></td>
</tr>
</table>