

SULIT

4551/1

NAMA:..... Tingkatan :.....

SULIT
4551/1
BIOLOGY
Kertas 1
Ogos
2009
1 ¼ jam



**BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA**

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2009**

**BIOLOGI
KERTAS 1**

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

- 1. Kertas soalan ini adalah dalam dwibahasa.*
- 2. Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*

Kertas soalan ini mengandungi 28 halaman bercetak

INFORMATION FOR CANDIDATES

1. *These question paper consists of 50 questions.*
2. *Answer **all** questions*
3. *Answer each question by blackening the correct space on the answer sheet.*
4. *Blacken **only one** space for each question.*
5. *If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.*
6. *The diagrams in the questions provided are not drawn to scale unless stated.*
7. *You may use a non-programmable scientific calculator.*

Instruction: Answer all questions.

1. Diagram 1 shows a structure of chloroplast.
Rajah 1 menunjukkan struktur kloroplas.

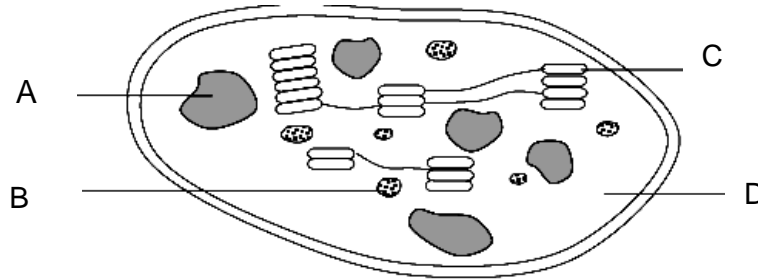


Diagram 1
Rajah 1

Which of the parts labeled A,B, C and D contain chlorophyll?
Manakah bahagian yang berlabel A,B, C dan D mengandungi klorofil?

2. Diagram 2 shows a model of plasma membrane.
Rajah 2 menunjukkan model membran plasma.

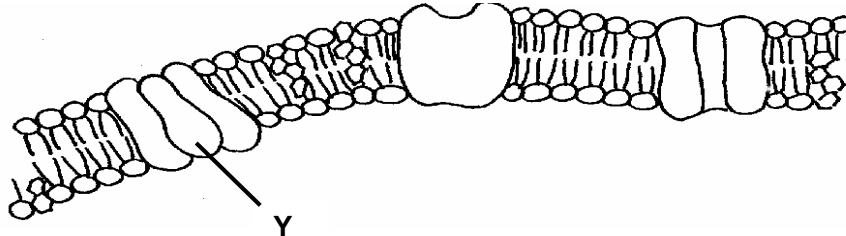


Diagram 2
Rajah 2

What is structure Y?
Apakah struktur Y?

- A Lipid
Lipid
- B Phospholipid
Fosfolipid
- C Pore protein
Protein liang
- D Carrier protein
Protein pembawa

3. Diagram 3 shows three structure of protein.
Rajah 3 menunjukkan tiga struktur protein.

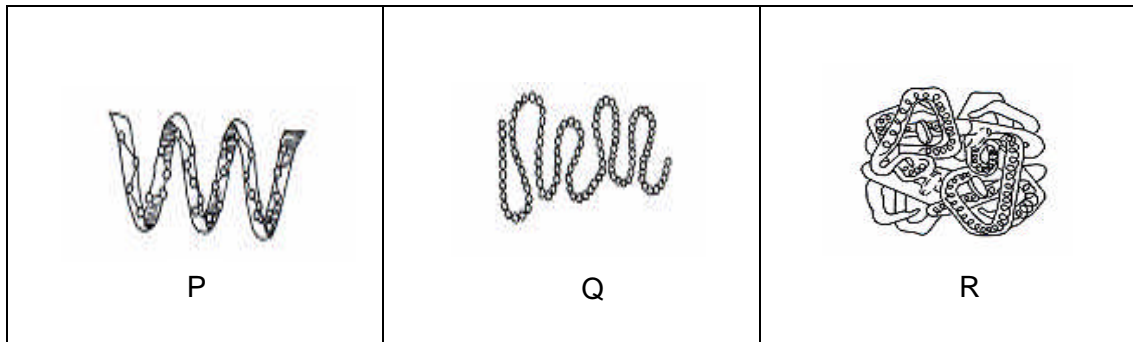
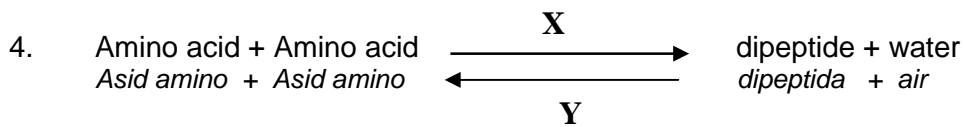


Diagram 3
Rajah 3

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

	P	Q	R
A	Primary <i>Primer</i>	Secondary <i>Sekunder</i>	Quaternary <i>Kuartenan</i>
B	Quaternary <i>Kuartenan</i>	Primary <i>Primer</i>	Secondary <i>Sekunder</i>
C	Quaternary <i>Kuartenan</i>	Secondary <i>Sekunder</i>	Primary <i>Primer</i>
D	Secondary <i>Sekunder</i>	Primary <i>Primer</i>	Quaternary <i>Kuartenan</i>



What is process X and Y?
Apakah X dan Y?

	X	Y
A	Hydrolysis <i>Hidrolisis</i>	Condensation <i>Kondensasi</i>
B	Condensation <i>Kondensasi</i>	Hydrolysis <i>Hidrolisis</i>
C	Hydrolysis <i>Hidrolisis</i>	Hydrolysis <i>Hidrolisis</i>
D	Condensation	Condensation

9. Diagram 5 shows a respiratory structure in an organism.
Rajah 5 menunjukkan struktur respirasi dalam satu organisma.



Diagram 5
Rajah 5

What is the respiratory structure shown in the diagram?
Apakah struktur respirasi yang ditunjukkan dalam rajah tersebut?

- | | |
|----------------------------|-------------------------------------|
| A Gills
<i>Insang</i> | C Alveolus
<i>Alveolus</i> |
| B Trachea
<i>Trakea</i> | D Moist skin
<i>Kulit lembap</i> |
10. Diagram 6 shows a set of apparatus to investigate anaerobic respiration by yeast.
Rajah 6 menunjukkan satu susunan radas untuk mengkaji respirasi anearob oleh yis.

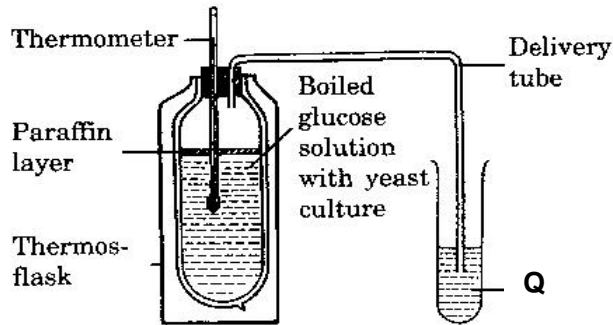


Diagram 6
Rajah 6

Substance Q is used to identify the type of gas releases during the process.
What is Q?

*Bahan Q digunakan untuk menentukan jenis gas yang dibebaskan semasa proses tersebut.
Apakah Q?*

- | | |
|--------------------------------------------|--------------------------------------------------|
| A Calcium oxide
<i>Kalsium oksida</i> | C Calcium carbonate
<i>Kalsium karbonat</i> |
| B Hydrogen oxide
<i>Hidrogen oksida</i> | D Calcium hydroxide
<i>Kalsium hidroksida</i> |

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

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

12. Which of the following process convert light energy to chemical energy?
 Antara proses berikut, yang manakah menukarkan tenaga cahaya kepada tenaga kimia?

- A Photosynthesis
Fotosintesis
- B Chemosynthesis
Kemosintesis
- C Photolysis of water
Penguraian molekul air
- D Hydrolisis of starch
Hidrolisis kanji

13. Diagram 7 shows the organisms P and Q.
 Rajah 7 menunjukkan organisma P dan Q.

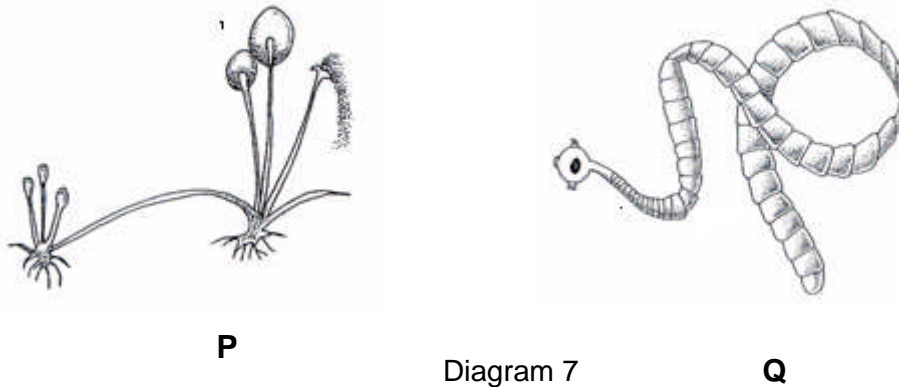
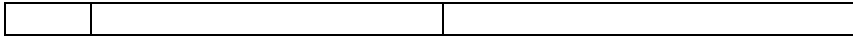


Diagram 7
 Rajah 7

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

	P	Q
A	Autotrophic Autotropik	Parasitic Parasitik
B	Saprophytic Saprofitik	Parasitic Parasitik
C	Holozoic Holozoik	Saprophytic Saprofitici
D	Parasitic Parasitik	Heterotropic Heterotropik



14.

Heat is trapped in the atmosphere,
the Earth's average temperature rises.
*Haba terperangkap di atmosfera,
Purata suhu bumi meningkat.*

Which term is correct to describe the phenomenon?
Antara istilah berikut, yang manakah menerangkan tentang fenomena tersebut?

- A Greenhouse Effect
Kesan Rumah Hijau
- B Thermal Pollution
Pencemaran terma
- C Climate change
Perubahan cuaca
- D Global warming
Pemanasan globali

15. The following information is about eutrophication.
Berikut adalah maklumat mengenai eutrofikasi.

P – Algae grow and cover the surface of the lake
Alga tumbuh dan meliputi permukaan kolam

Q – The rate of bacteria reproduction increases
Kadar pertumbuhan bacteria meningkat

R – BOD of water increases
BOD meningkat

S – Organic fertilizer flows into the lake
Baja organik mengalir ke dalam kolam

Which of the following sequences is correct about the eutrophication process?
Antara berikut, manakah urutan yang betul tentang proses eutrofikasi?

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

16. Which of the following shows the correct sequence of the blood flowing in the pulmonary circulation?
Antara berikut yang manakah menunjukkan urutan yang betul tentang pengaliran darah dalam peredaran pulmonari?
- A Pulmonary artery → Lungs → Pulmonary vein → Heart
Arteri pulmonari → Peparu → vena pulmonari → Jantung
- B Aorta → Lungs → Pulmonary artery → Heart
Aorta → Peparu → Arteri pulmonari → Jantung
- C Pulmonary vein → Heart → Aorta → Body Cells
Vena pulmonari → Jantung → Aorta → Sel badan
- D Vena cava → Heart → Pulmonary artery → Lungs
Vena kava → Jantung → Arteri Pulmonari → Peparu
17. Diagram 8 shows a type of blood circulatory system.
Rajah 8 menunjukkan sejenis sistem peredaran darah.

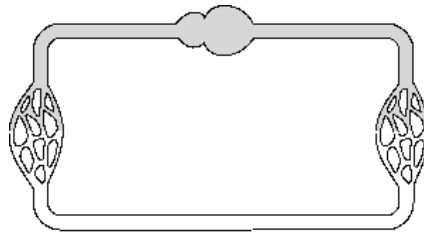


Diagram 8
Rajah 8

- Which of the organism has the blood circulatory system in the diagram above?
Apakah organisma yang mempunyai sistem peredaran darah seperti rajah diatas?
- | | |
|-----------------------------|---------------------------------|
| A Cockroach
<i>Lipas</i> | C Penguin
<i>Penquin</i> |
| B Lizard
<i>Cicak</i> | D Gold Fish
<i>Ikan emas</i> |
18. Which artery carries blood with the lowest oxygen concentration?
Apakah arteri yang membawa darah yang mengandungi kepekatan oksigen paling rendah?
- A The pulmonary artery
Arteri pulmonari
- B The mesenteric artery
Arteri mesentari
- C The hepatic artery
Arteri hepatic
- D The renal artery

Arteri renal

19. Diagram 9 shows human bones.
Rajah 9 menunjukkan tulang manusia.

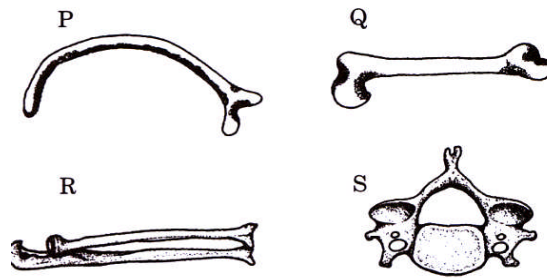


Diagram 9
Rajah 9

Which bones are part of the appendicular skeleton?
Antara berikut, tulang yang manakah sebahagian daripada rangka apendaj?

- A P and S
P dan S
- B Q and R
Q dan R
- C P, Q and R
P, Q dan R
- D Q, R and S
Q, R dan S
20. Diagram 10 shows a part of vertebral column of human.
Rajah 10 menunjukkan sebahagian daripada turus vertebra manusia.

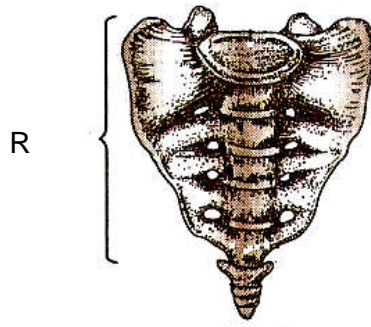


Diagram 10
Rajah 10

What is the number of bones found in part R?
Apakah bilangan tulang yang terdapat di bahagian R?

- A 1
- B 5
- C 8
- D 33

21. Diagram 11 shows parts of the human brain.
Rajah 11 menunjukkan bahagian otak manusia.

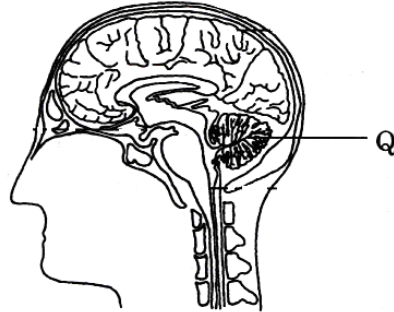


Diagram 11
Rajah 11

What is the function of Q?
Apakah fungsi Q?

- A Controls thinking
Mengawal pemikiran
 - B Controls rate of heart beat
Mengawal degupan jantung
 - C Controls balancing of body
Mengawal keseimbangan badan
 - D Controls peristalsis movement
Mengawal pergerakan peristalsis
22. Diagram 12 shows a cross section of the stem of dicotyledon plant which experiences secondary growth.
Rajah 12 menunjukkan keratan rentas batang tumbuhan dikotiledon yang mengalami pertumbuhan sekunder.

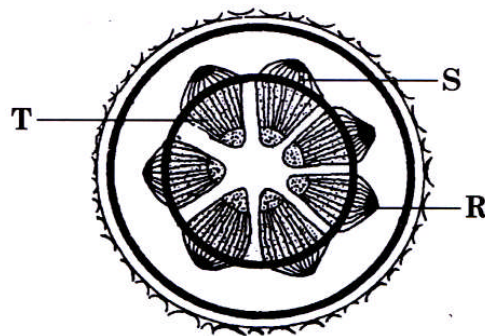


Diagram 12
Rajah 12

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

	R	S	T
A	Primary phloem <i>Floem primer</i>	Secondary xylem <i>Xylem sekunder</i>	Secondary phloem <i>Floem sekunder</i>
B	Secondary xylem <i>Xylem sekunder</i>	Primary phloem <i>Floem primer</i>	Secondary phloem <i>Floem sekunder</i>
C	Secondary phloem <i>Floem sekunder</i>	Primary phloem <i>Floem primer</i>	Secondary xylem <i>Xylem sekunder</i>
D	Primary phloem <i>Floem primer</i>	Secondary phloem <i>Floem sekunder</i>	Secondary xylem <i>Xylem sekunder</i>

23. Diagram 13 belows shows the stages in the development of embryo of a human.
 Rajah 13 menunjukkan peringkat-peringkat dalam perkembangan embrio manusia.

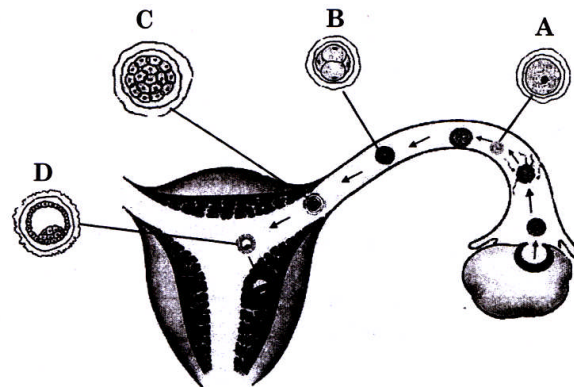


Diagram 13
 Rajah 13

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

24. Diagram 14 shows genotype of offsprings from parent P and Q.
Rajah 14 menunjukkan genotip anak daripada induk P dan Q.

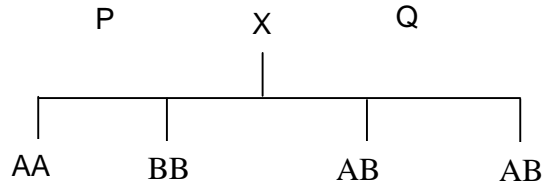


Diagram 14
Rajah 14

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

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

25. Which of the following characteristics in garden pea plants shows continuous variation?
Yang mana satukah merupakan ciri yang menunjukkan variasi selanjara dalam pokok kacang pea?

- A Flower colour
Warna bunga
- B Seed shape
Bentuk biji benih
- C Seed colour
Warna biji benih
- D Length of leaf
Panjang daun

26. Diagram 15 shows a plant cell.
Rajah 15 menunjukkan satu sel tumbuhan.

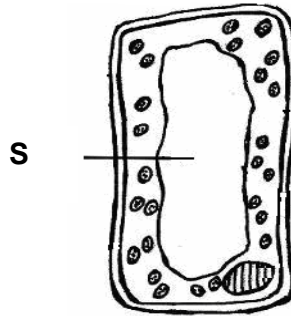


Diagram 15
Rajah 15

- What is the function of structure S?
Apakah fungsi struktur S?
- A Excrete of waste product from the cell.
Mengeluarkan bahan kumuh daripada sel.
 - B Maintain turgidity of the cell.
Mengekalkan kesegahan sel.
 - C Control size of the cell.
Mengawal saiz sel.
 - D Maintain the shape of the cell.
Mengekalkan bentuk sel.
27. What is the function of cholesterol molecules in the plasma membrane?
Apakah fungsi molekul kolestrol dalam plasma membran?
- A As membrane carriers to move substances across the plasma membrane by active transport.
Sebagai membran pembawa yang mengangkut bahan merentasi membrane plasma secara pengangkutan aktif.
 - B To form protein channels for facilitated diffusion of mineral ions.
Membentuk protein liang untuk resapan berbantu ion mineral.
 - C To join the proteins with phospholipid molecules.
Menghubungkan protein dengan molekul fosfolipid .
 - D To stabilize the fluidity of the plasma membrane.
Menstabilkan keanjalan membran plasma..

28. Diagram 16 shows an organic compound.
Rajah 16 menunjukkan sejenis sebatian organik

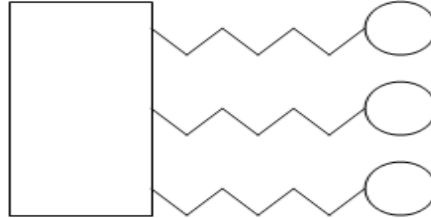


Diagram 16
Rajah 16

Which of the following enzyme can hydrolyse the organic compound
Antara enzim berikut, yang manakah boleh menghidrolisis sebatian organik tersebut.

- | | | | |
|---|-------------------------|---|-----------------------------|
| A | Lipase
<i>Lipase</i> | C | Protease
<i>Protease</i> |
| B | Zimase
<i>Zimase</i> | D | Sucrase
<i>Sukrase</i> |
29. Diagram 17.1 shows the chromosomes of a parent cell.
Rajah 17.1 menunjukkan kromosom dalam sel induk.

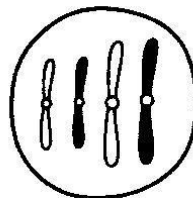


Diagram 17.1
Rajah 17.1

Diagram 17.2 shows the possible combinations of chromosomes in the daughter cells when the parent cell divides.
Rajah 17.2 menunjukkan kemungkinan gabungan kromosom dalam sel anak apabila sel induk membahagi.

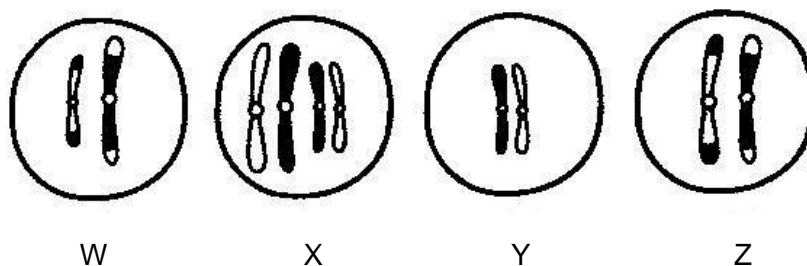


Diagram 17.2
Rajah 17.2

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

- A Cell X has haploid number of chromosomes
Sel X mempunyai bilangan kromosom yang haploid.
- B Cell Z is a product of meiosis
Sel Z adalah hasil meiosis.
- C Cell Y is a product of mitosis
Sel Y adalah hasil mitosis
- D Cell W can become a gamete
Sel W boleh menjadi gamet

30. Diagram 18 shows a phase during meiosis.
Rajah 18 menunjukkan satu fasa semasa meiosis.

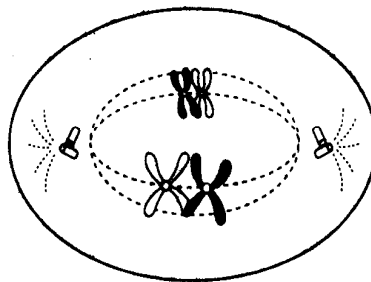


Diagram 18
Rajah 18

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

- A Produce daughter cell with equal number of chromosome as the parent cell.
Menghasilkan sel anak yang mempunyai bilangan kromosom yang sama dengan sel induk.
- B Cause crossing over occurs between homologous chromosome.
Menyebabkan pindah silang berlaku antara kromosom homolog.
- C Halved the number of chromosome in each daughter cell.
Bilangan kromosom dalam sel anak menjadi separuh.
- D Produce variation in gamete
Menghasilkan variasi pada gamet.

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

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

Table 1
Jadual 1

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

	Lime juice <i>Jus limau</i>	Papaya juice <i>Jus betik</i>
A	45.0	27.8
B	27.8	12.5
C	44.0	12.5
D	55.0	44.0

32. The chemical equation shows a type of respiration in human muscle during vigorous exercise.

Persamaan kimia menunjukkan sejenis respirasi yang berlaku dalam otot manusia semasa aktiviti cergas.



Which statement explain why muscle cells needs more oxygen just after the activity.

Apakah pernyataan yang menerangkan kenapa sel otot memerlukan lebih oksigen sebaik sahaja selepas aktiviti tersebut.

- A To transfer lactic acid from muscle tissue to the liver.
Memindahkan asid laktik dari tisu otot ke hati.
 - B To oxidize lactic acid to produce energy
Mengoksidakan asid laktik bagi menghasilkan tenaga.
 - C To oxidize lactic acid to glucose
Mengoksidakan asid laktik kepada glukosa.
 - D To convert glucose to glycogen.
Menukarkan glukosa kepada glikogen
33. Diagram 19 shows the energy flow from producer to secondary consumer.
Rajah 19 menunjukkan aliran tenaga daripada pengeluar kepada pengguna sekunder.

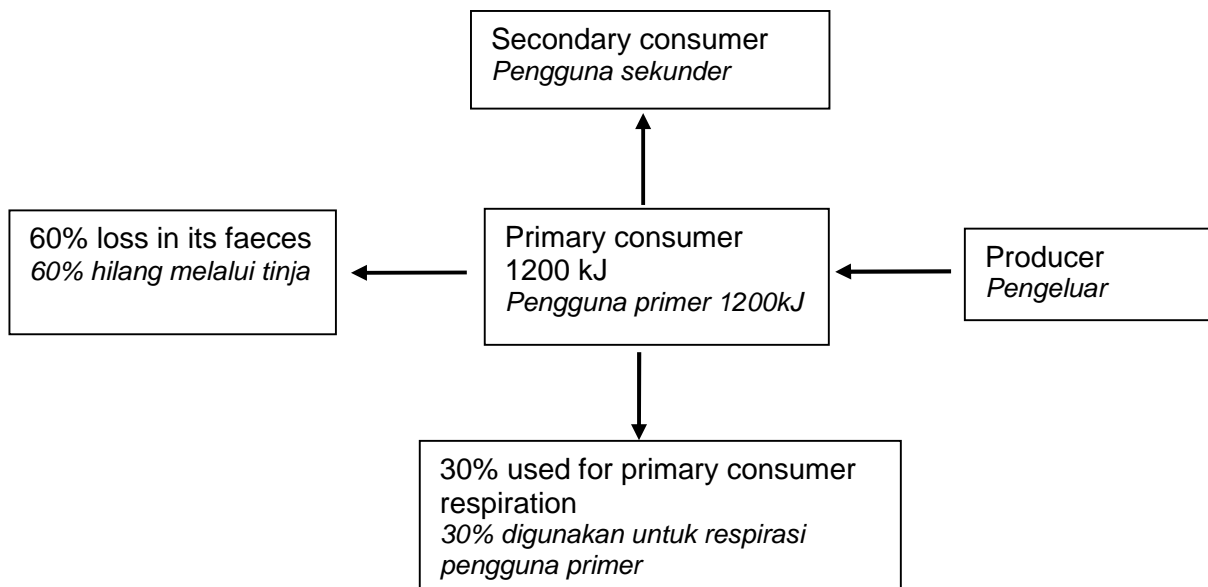


Diagram 19
Rajah 19

What is the total energy passed down to the secondary consumer?

Apakah jumlah tenaga yang diterima oleh pengguna sekunder?

- A 1080 kJ
- C 360 kJ

B 720 kJ

D 120 kJ

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

I	One male gamete nucleus fuses with the nucleus of an egg cell to form an embryo sac. <i>Satu nukleus gamet jantan bergabung dengan nukleus sel telur untuk membentuk pundi embrio.</i>
II	Two haploid nuclei formed in the ovule fuse with two male gamete nuclei. <i>Dua nucleus haploid dalam ovul bergabung dengan dua nucleus gamet jantan.</i>
III	One male gamete nucleus fuses with the female nucleus to form a diploid zygote. <i>Satu nukleus gamet jantan bergabung dengan nukleus betina untuk membentuk zigot yang diploid.</i>
IV	Two polar nuclei fuse with one male nucleus to form the endosperm. <i>Dua nukleus kutub bergabung dengan satu nucleus gamet jantan membentuk endosperma.</i>

A I and II only

C I, II, and III only

B III and IV only

D II, III, and IV only

35. Which of the following is the correct sequence representing the stages in ozone depletion.
Antara berikut yang manakah menunjukkan turutan yang betul tentang peringkat dalam penipisan lapisan ozon.

I	CFCs releases chlorine atoms <i>Atom klorin membebaskan CFCs</i>
II	Chlorine atoms react with ozone molecules <i>Atom klorin bertindak dengan molekul ozon</i>
III	CFCs breaks down with the presence of Ultraviolet radiations <i>CFCs diuraikan dengan kehadiran sinar ultraungu.</i>

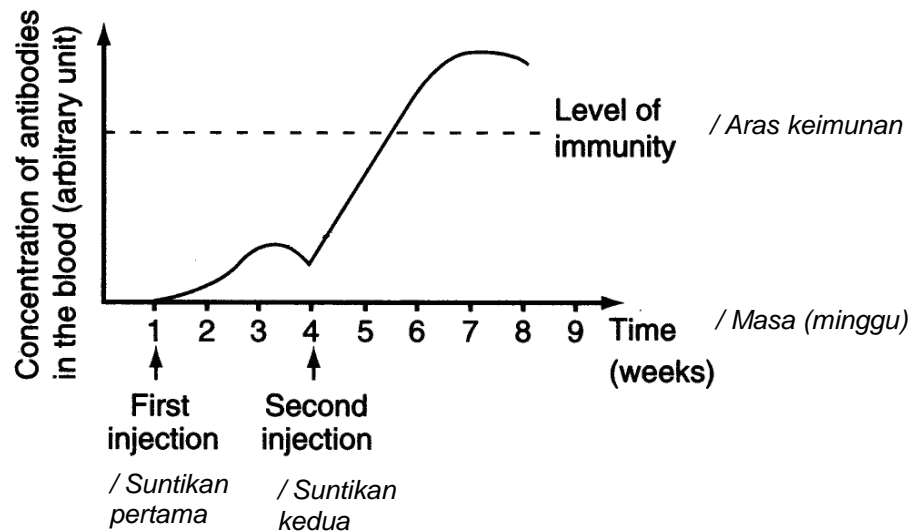
A III → I → II

C II → I → III

B II → III → I

D I → II → III

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



Graph 1
Graf 1

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

- A Both injections contain serum that can raise antibody level.
Kedua-dua suntikan mengandungi serum yang boleh meningkatkan aras antibodi.
- B Second injection is required to boost level of immunity.
Suntikan kedua diperlukan untuk meningkatkan aras keimunan.
- C Both injections contains pathogen which control production of antibody.
Kedua-dua suntikan mengandungi pathogen yang mengawal penghasilan antibodi.
- D Second injection contains higher level of antibody.
Suntikan kedua mengandungi aras antibody yang lebih tinggi.

37. Diagram 20 shows the structure of human forearm.
Rajah 20 menunjukkan struktur anggota hadapan manusia.

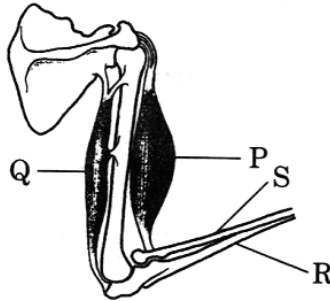


Diagram 20
Rajah 20

What happens to the parts P, Q, R and S which cause the arm to be in the position as shown in the diagram?

Apakah yang berlaku kepada bahagian P, Q dan S yang menyebabkan lengan berada dalam keadaan seperti rajah tersebut?

	P	Q	S
A	Relaxes <i>Mengendur</i>	Contracts <i>Mengecut</i>	Is pushed downwards <i>Ditolak kearah bawah</i>
B	Contracts <i>Mengecut</i>	Relaxes <i>Mengendur</i>	Is pushed downwards <i>Ditolak kearah bawah</i>
C	Relaxes <i>Mengendur</i>	Contracts <i>Mengecut</i>	Is pulled upward <i>Ditarik kearah atas</i>
D	Contracts <i>Mengecut</i>	Relaxes <i>Mengendur</i>	Is pulled upward <i>Ditarik kearah atas</i>

- 38.

Blushing or flushing of the skin leads to heat lost from the body.

Kemerahan pada kulit menyebabkan kehilangan haba daripada badan.

Which of the following statement explains the condition?

Antara pernyataan berikut yang manakah menerangkan keadaan tersebut?

- A Dilation of blood capillaries
Pengembangan kapilari darah
- B Constriction of blood capillaries

Pencerutan kapilari darah

- C Erythrocytes increase in number due to heat lost
Bilangan eritrosit bertambah disebabkan oleh kehilangan haba.
- D Erythrocytes dilates due to absorption of heat
Eritrosit mengembang disebabkan oleh penyerapan haba.

39. Diagram 21 shows stages in the development of an embryo sac in the ovule of flowering plant.
Rajah 21 menunjukkan peringkat dalam perkembangan pundi embryo dalam ovul tumbuhan berbunga.

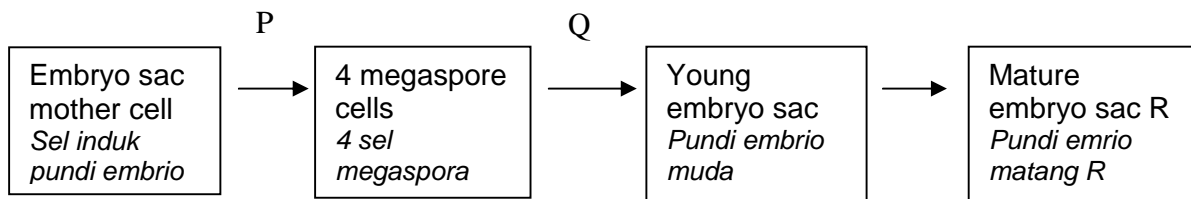


Diagram 21
Rajah 21

What are process P, Q and structure R ?
Apakah proses P, Q dan struktur R?

	Process P <i>Proses P</i>	Process Q <i>Proses Q</i>	Structure R <i>Struktur R</i>
A	Mitosis <i>Mitosis</i>	Meiosis <i>Meiosis</i>	4 haploid nuclei <i>4 nukleus haploid</i>
B	Mitosis <i>Mitosis</i>	Meiosis <i>Meiosis</i>	8 haploid nuclei <i>8 nukleus haploid</i>
C	Meiosis <i>Meiosis</i>	Mitosis <i>Mitosis</i>	4 haploid nuclei <i>4 nukleus haploid</i>
D	Meiosis <i>Meiosis</i>	Mitosis <i>Mitosis</i>	8 haploid nuclei <i>8 nukleus haploid</i>

40. Diagram 22 shows a method of producing fruits from flowering plants using auxin hormone.

Rajah 22 menunjukkan satu kaedah menghasilkan buah daripada tumbuhan berbunga menggunakan hormon auksin.

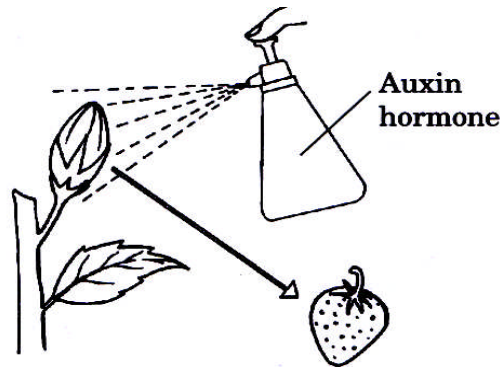


Diagram 22
Rajah 22

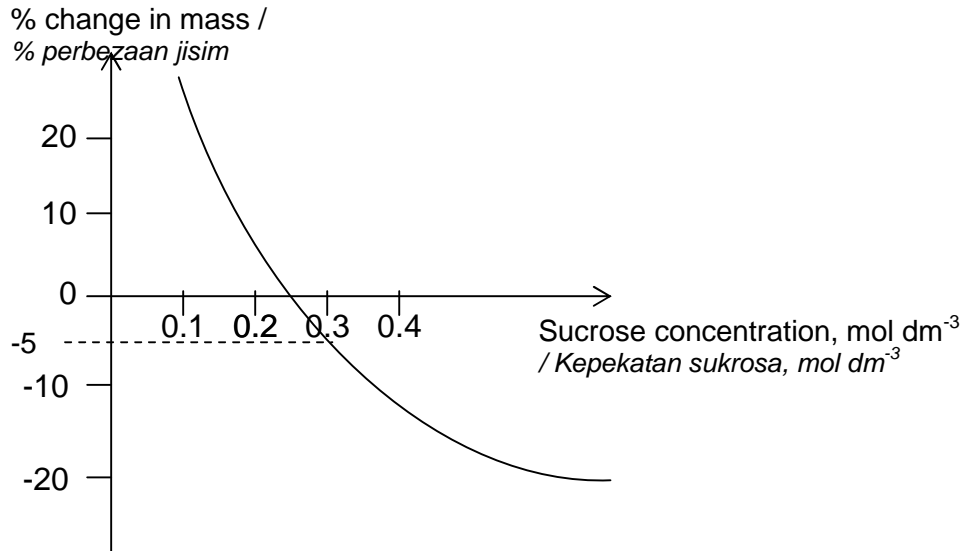
Which is true about the characteristic of the fruit formed?

Antara berikut yang manakah benar tentang ciri buah yang terbentuk.

- A The fruit is sweeter
Buah adalah lebih manis
- B The fruit is more sekulen
Buah adalah lebih sekulen
- C The fruit has more fibre
Buah mengandungi lebih fiber
- D The fruit does not have seeds
Buah tidak mengandungi biji benih

41. Graph 2 shows the percentage change in mass of potato cylinders in sucrose solutions of various concentrations.

Graf 2 menunjukkan peratus perubahan jisim selinder kentang dalam larutan sukrosa yang pelbagai kepekatan.



Graph 2
Graf 2

If the average initial weight of each potato cylinder is 3.50 g, what is the average final weight of the potato cylinders that have been immersed in the 0.3 mol dm⁻³ sucrose solution?

Jika purata jisim bagi setiap selindar kentang adalah 3.50 g, apakah purata berat akhir bagi selindar kentang yang telah direndam dalam 0.3 mol dm⁻³ larutan sukrosa?

- | | |
|----------|----------|
| A 3.00 g | C 3.33 g |
| B 3.15 g | D 3.68 g |

42. Diagram 23 shows a dirty shirt which will be cleaned using a detergent containing enzyme

Rajah 23 akan di basuh dengan mengandungi enzim.

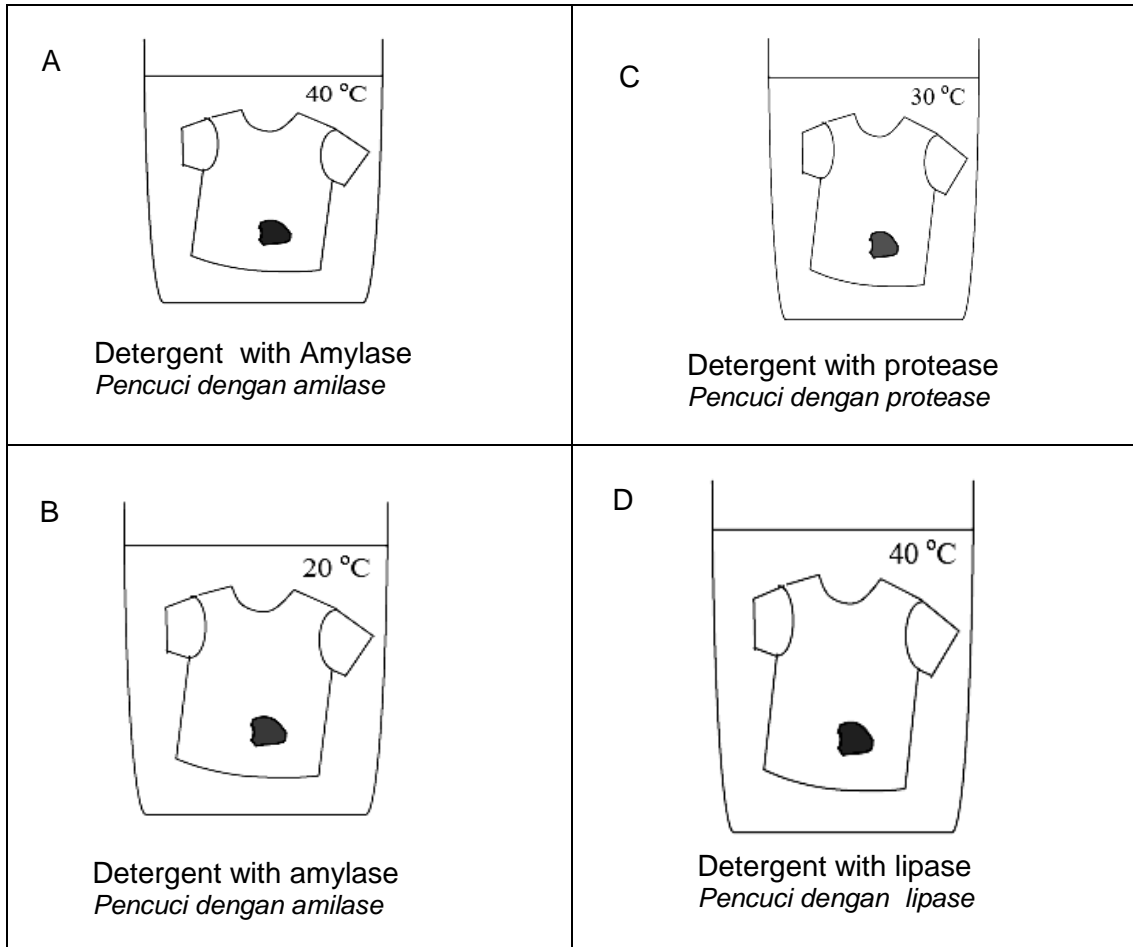


menunjukkan sehelai baju kotor yang menggunakan serbuk pencuci

Grease spot
Tompok minyak

Diagram 23
Rajah 23

Which of the following treatment is the fastest to clean the grease?
Antara berikut, yang manakah rawatan paling cepat membersihkan tompok minyak tersebut?



43. Diagram 24 shows a cell cycle of an organism.
Rajah 24 menunjukkan kitar sel bagi satu organisma.

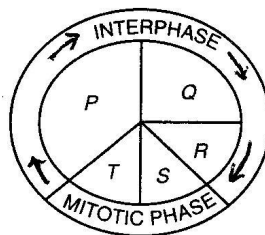


Diagram 24

Rajah 24

A respiratory inhibitor is introduced into the culture containing a dividing cell at phase Q. Which of the following will occur to the cell.

Perencat respirasi diletakkan kedalam kultur yang mengandungi sel yang sedang membahagi pada fasa Q. Apakah yang akan berlaku kepada sel tersebut?

- A The cell increase in size
Sel tersebut mengalami pertambahan saiz.
- B The cell double its number
Sel tersebut mengganda bilangannya.
- C The cell fails to divide
Sel tersebut gagal membahagi.
- D The cell breaks down
Sel tersebut terurai

44. In an experiment to estimate the population of bat in a cave, a student obtained the following data.

Dalam eksperimen menganggar saiz populasi kelawar dalam sebuah gua, pelajar telah memperolehi data seperti berikut.

Bat caught and marked on the first catch <i>Kelawar ditangkap dan ditanda pada tangkapan pertama</i>	70
Bat caught on the fifth night <i>Kelawar ditangkap pada malam ke lima</i>	60
Bat marked on the second catch <i>Kelawar bertanda pada tangkapan kedua</i>	2

What is the population size of bats in the cave.

Apakah saiz populasi kelawar dalam gua tersebut.

- A 260
- B 2030
- C 2100
- D 2380

- 45.

A young plant has all its root hair removed. The rate of transpiration of the plant is drops.

Satu tumbuhan muda telah dibuang akar rerambutnya. Kadar transpirasi tumbuhan tersebut menurun.

Which of the following statement correctly explain the condition.

Antara pernyataan berikut yang manakah menerangkan keadaan tersebut.

- A Reduce surface area for absorption of water.
Mengurangkan luas permukaan untuk penyerapan air.

- B Reduce rate of water transport.
Mengurangkan kadar pengangkutan air.
- C Reduce rate of evaporation.
Mengurangkan kadar penyerapan.
- D Reduce capillarity action.
Mengurangkan tindakan kapilari.
46. Diagram 25 shows a excretory system of a person with gallstone at X.
Rajah 25 menunjukkan sistem perkumuhan yang mempunyai batu karang pada X.

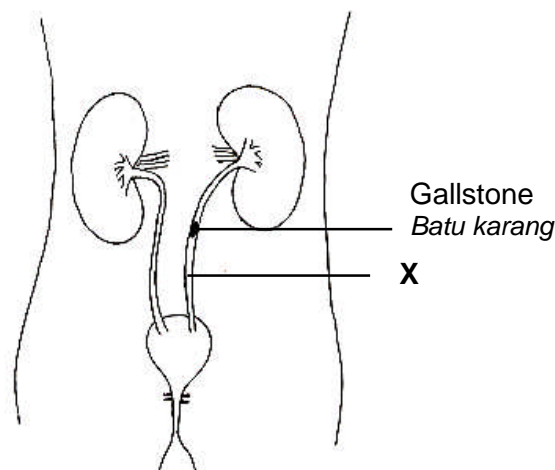


Diagram 25
Rajah 25

- Which is the best method to treat the gallstone?
Apakah kaedah terbaik untuk merawat batu karang tersebut.
- A Cut and remove X.
Potong dan keluarkan X.
- B Drink plenty of water to dislodge X.
Minum banyak air untuk menanggalkan X.
- C Use laser to break down the gallstone at X.
Guna pancaran laser untuk memecahkan batu karang pada X.
- D Cut and remove the kidney connected to X.
Potong dan keluarkan ginjal yang bersambung dengan X.
47. A scientist crossed two heterozygous pea plants with round and yellow seeds. From this cross, he obtains 32 plants with wrinkled and green seeds. If round and yellow alleles are dominant, what is the number of plants with wrinkled and yellow seeds will he get from this cross?
Seorang saintis telah mengacuk dua pokok kacang heterozigous untuk benih yang licin dan berwarna kuning. Hasil daripada kacukan ini, dia dapat 32 pokok yang berbenih kedut dan berwarna hijau. Jika alel licin dan kuning adalah dominan, berapa pokok berbenih kedut dan kuning dia boleh dapat daripada kacukan ini?

A 33

C 96

B 64

D 288

48. Diagram 25 shows the result of the monohybrid cross between trait rambutan tree P and rambutan tree Q, 50% of the offspring are tall and 50% are dwarf.
Rajah 25 di bawah menunjukkan keputusan kacukan monohybrid bagi pokok rambutan R dan rambutan Q. 50% dari anak yang terhasil kesemuanya tinggi manakala 50% lagi kerdil.

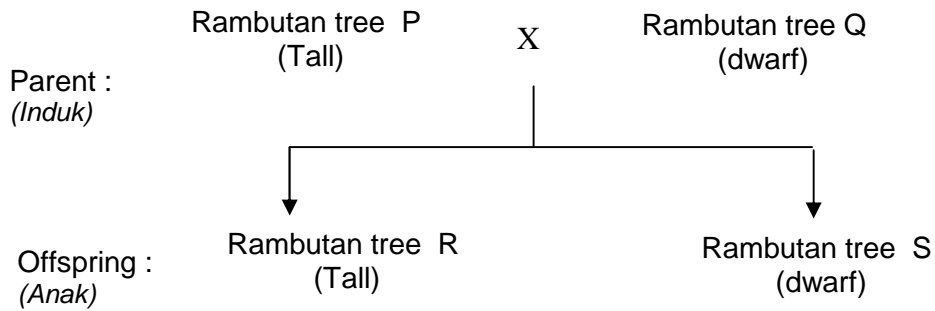


Diagram 25
Rajah 25

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

A 0%

C 50%

B 25%

D 75%

49. Diagram 26 shows a change in the structure of two chromosomes undergoing mitosis after being exposed to radioactive rays for 2 hours.
Rajah 26 menunjukkan perubahan struktur yang berlaku pada kromosom yang menjalani mitosis setelah terdedah pada sinaran radioaktif selama 2 jam.

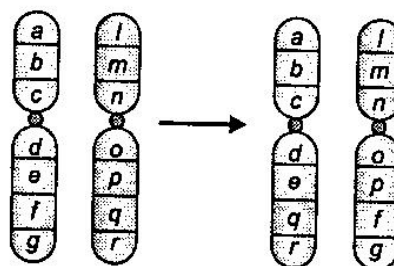


Diagram 26
Rajah 26

What type of mutation is this ?
Apakah jenis mutasi ini?

A Deletion
Pelenyapan

C Translocation
Translokasi

B Duplication
Penggandaan

D Inversion
Penyongsangan

50. A male Down Syndrome married to a female Down Syndrome. What is the probability of the couple having children.

Seorang lelaki Down Syndrom berkahwin dengan seorang perempuan Down syndrom. Apakah kebarangkalian untuk pasangan ini memperolehi anak.

A 0%

C 50%

B 25%

D 100%

END OF QUESTION PAPER

**4551/1
Biology
Kertas 1
Ogos 2009
1¼ jam**



**SEKOLAH BERASRAMA PENUH
BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH/ KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA**

**PEPERIKSAAN PERCUBAAN SETARA
SPM 2009**

**BIOLOGI
KERTAS 1
PERATURAN PEMARKAHAN
UNTUK KEGUNAAN PEMERIKSA SAHAJA**

Peraturan pemarkahan ini mengandungi 2 halaman bercetak

**MARKING SCHEME
PAPER 1
TRIAL SBP 2009**

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

SULIT

4551/2

NAMA:..... Tingkatan :.....

SULIT
4551/2
BIOLOGI
Kertas 2
Ogos
2009
2 ½ jam



**BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA**

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2009**

BIOLOGI
Kertas 2

Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tuliskan nama dan tingkatan pada ruang yang disediakan.*
2. *Jawab semua soalan daripada Bahagian A. Tuliskan jawapan anda dalam ruang yang disediakan*
3. *Jawab dua soalan daripada Bahagian B. Jawapan kepada Bahagian B hendaklah ditulis pada kertas tulis.*
4. *Anda diminta menjawab dengan lebih terperinci untuk Bahagian B. Jawapan mestilah jelas dan logik. Persamaan, gambar rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda boleh digunakan.*
5. *Penggunaan kalkulator saintifik yang tidak boleh diprogramkan adalah dibenarkan.*

Bahagian	Soalan	Markah penuh	Markah diperoleh
A	1	12	
	2	12	
	3	12	
	4	12	
	5	12	
B	6	20	
	7	20	
	8	20	
	9	20	
Jumlah			

Kertas soalan ini mengandungi **20** halaman bercetak

Section A
Bahagian A

[60 marks]
[60 markah]

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

- 1 Diagram 1.1 shows a root hair cell from Plant R and the surrounding soil particles.
Rajah 1.1 menunjukkan sel akar rambut tumbuhan R dan butiran tanah di sekelilingnya.

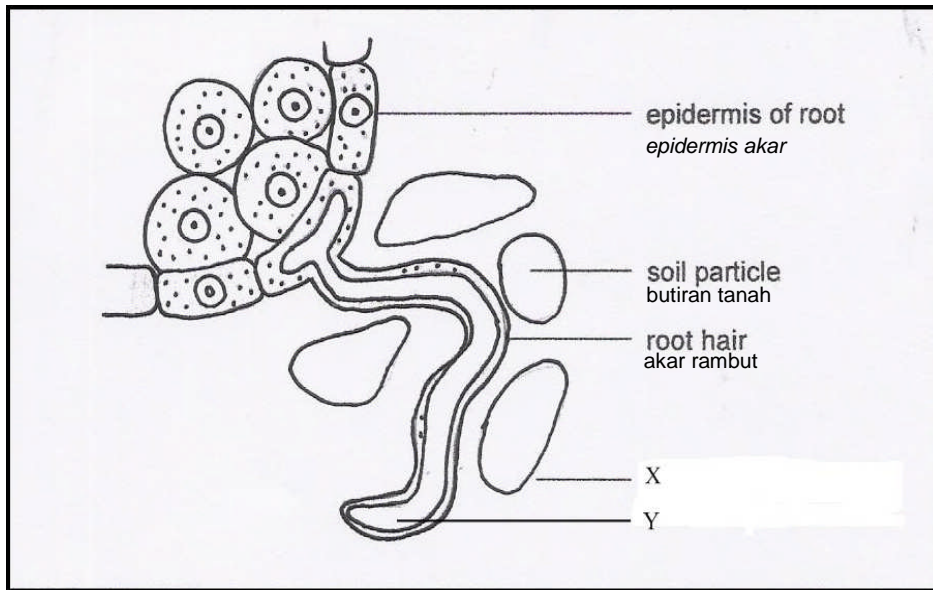


Diagram 1
Rajah 1

- (a) (i) Name the process by which root hair cells absorb water.
Namakan proses di mana sel akar rambut menyerap air.

.....
[1 mark]
[1 markah]

1 (a)(i)

- (ii) Define the process in a(i).
Berikan definisi proses di a(i)

.....
[1 mark]
[1 markah]

1 (a)(ii)

(b) Based on diagram 1, which of the region X and Y has
Berdasarkan rajah 1, yang manakah antara X dan Y mempunyai

(i) lower water concentration
kepekatan air yang lebih rendah

.....

(ii) higher water concentration
kepekatan air yang lebih tinggi

.....

[2 marks]
[2 markah]

1 (b)

(c) Draw an arrow on Diagram 1 to show the movement of water in a root hair cells of plant R.
Lukiskan anak panah pada Rajah 1 untuk menunjukkan penyerapan air pada sel akar rambut bagi tumbuhan R.

[1 mark]
[1 markah]

1 (c)

(d) A farmer applied a large quantity of fertilizer on Plant R. Predict and explain what will happen with Plant R in a few days.
Seorang petani menaburkan baja yang berlebihan pada tumbuhan R. Ramal dan terangkan apakah yang akan berlaku pada tumbuhan R selepas beberapa hari.

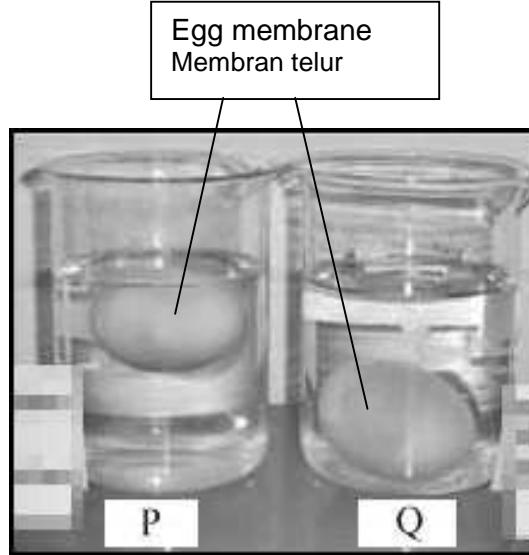
.....
.....
.....
.....
.....

[3 marks]
[3 Markah]

1 (d)

(e) Photograph 1 shows two fresh raw eggs with their shells removed with acid which have been soaked for one hour into solution P and Q respectively.

Gambar foto 1 menunjukkan dua biji telur segar yang mentah di mana kulit luarnya telah dipisahkan dengan menggunakan asid dan telah direndam masing-masing dalam larutan P dan Q.



Photograph 1
Gambar foto 1

Explain the processes which occur in both P and Q

Terangkan proses yang berlaku dalam P dan Q

P:.....

.....

Q:.....

.....

[4 marks]
[4 markah]

1 (e)

TOTAL

2. Diagram 2.1 shows the vertebral column of human.
Rajah 2.1 menunjukkan turus vertebra manusia.

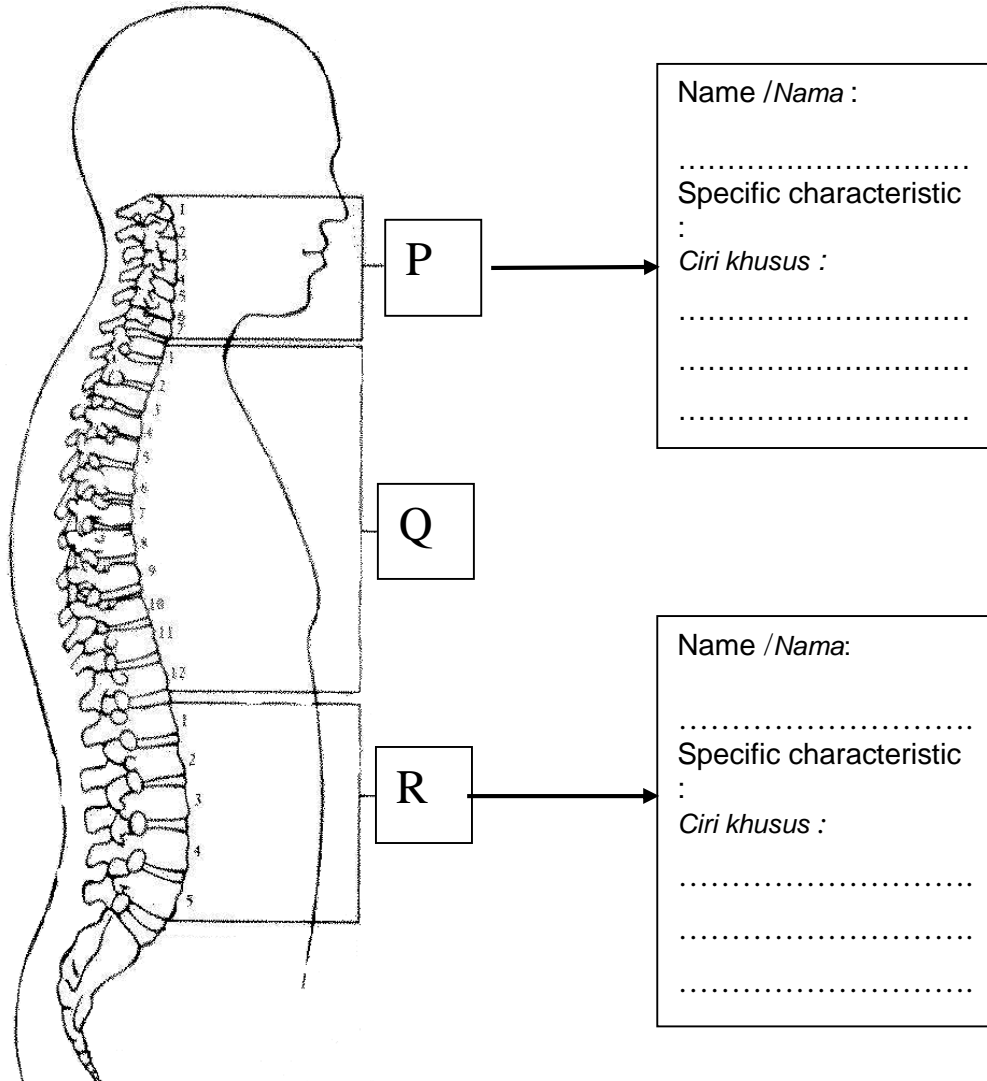


Diagram 2.1
Rajah 2.1

- (a) In boxes provided at Diagram 2.1, name vertebra in region P and R. State their special structure characteristic.
Pada kotak yang disediakan pada Rajah 2.1, namakan vertebra dalam kawasan P dan R. Nyatakan ciri khas yang terdapat pada strukturnya.

[4 marks]
 [4 markah]

2 (a)

(b) Vertebra in region Q and R have variation in the size and shape but all still have similar structure. Explain the similarity.

Vertebra pada bahagian Q dan R mempunyai variasi dalam saiz dan bentuk tetapi semuanya masih mempunyai persamaan struktur.

Terangkan persamaan itu.

.....
.....
.....
.....

[2 marks]
[2 markah]

2 (b)

(c) Diagram 2.2 shows vertebrae in region R. Structure S is located between the vertebrae.

Rajah 2.2 menunjukkan vertebra pada kawasan R. Struktur S terdapat di antara vertebra.

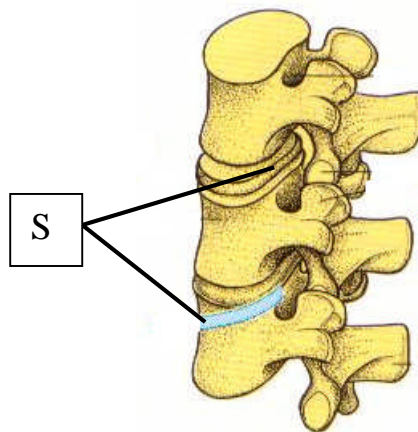


Diagram 2.2
Rajah 2.2

(i) Name structure S.
Namakan struktur S.

.....
[1 mark]
[1 markah]

2 (c)(i)

(ii) Explain the function of structure S.
Terangkan fungsi struktur S.

.....
.....
.....

[2 marks]

2 (c)(ii)

[2 markah]

(d) Madam Zee is 64 years old. She suffer from osteoporosis and find it hard to walk. The doctor has recommended that she has a hip replacement. Therefore, Madam Zee takes plenty of dairy products.

Puan Zee berumur 64 tahun. Beliau menderita osteoporosis dan mengalami kesukaran untuk berjalan. Doktor menyarankan beliau menjalani penggantian tulang paha. Oleh itu, beliau mengambil banyak hasil tenusu.

(i) Give reason why taking plenty of dairy products is a good idea.

Berikan alasan mengapa mengambil banyak hasil tenusu merupakan idea yang baik.

.....
.....

2 (d)(i)

[1 mark]
[1 markah]

(ii) State **two** possible disadvantages of having a hip replacement.

*Nyatakan **dua** kemungkinan keburukkan menjalani pembedahan paha.*

1.

.....

2.

.....

2 (d)(ii)

[2 marks]
[2 markah]

TOTAL

- 3 Diagram 3 shows the structure of respiratory system in human.
Rajah 3 menunjukkan struktur system respirasi manusia.

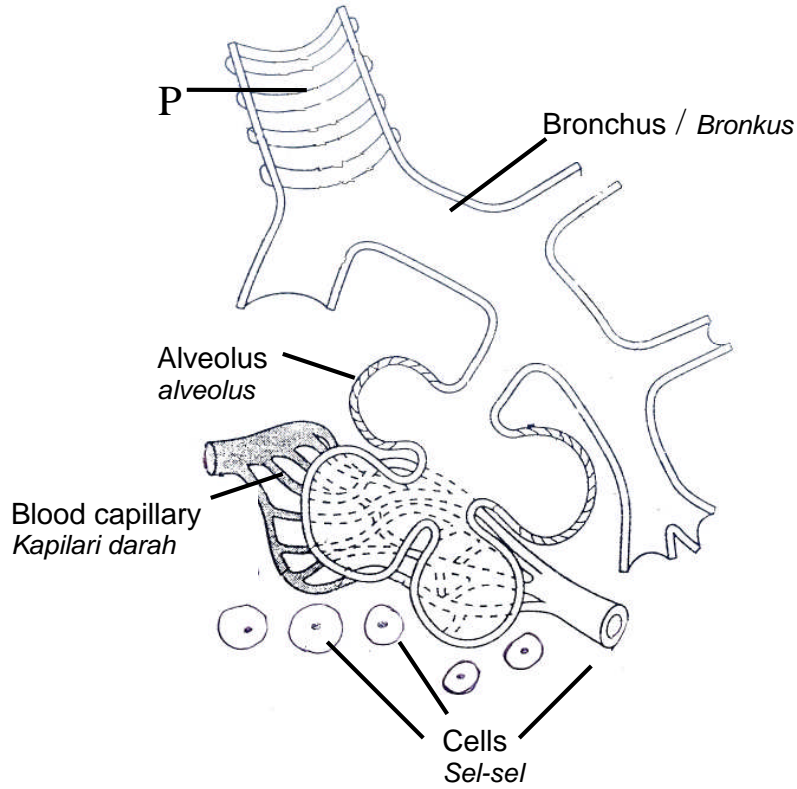


Diagram 3
Rajah 3

- (a) Based on Diagram 3, explain **one** adaptation of alveolus for efficient gases exchange.
*Berdasarkan Rajah 3, terangkan **satu** penyesuaian pada alveolus untuk pertukaran gas yang cekap.*

.....

[2 marks]
 [2 markah]

3 (a)

- (b) (i) Name P
Namakan P

.....

[1 mark]
 [1 markah]

3 (b)(i)

(ii) Explain the role of P to prevent dirt and bacteria from entering the alveolus.

Terangkan peranan P untuk mengelakkan kotoran dan bakteria dari memasuki alveolus.

.....
.....
.....

[2 marks]
[2 markah]

3 (b)(ii)

(c) (i) On Diagram 3, draw labeled arrow (→) to show the direction of

- Blood flow
- Oxygen diffusion
- Carbon dioxide diffusion

Pada Rajah 3, lukiskan anak panah berlabel (→) untuk menunjukkan arah :

- Pengaliran darah
- Resapan oksigen
- Resapan karbon dioksida

[3 marks]
[3 markah]

3 (c)(i)

(ii) Explain why the diffusion of oxygen occur at the alveolus.

Terangkan mengapa resapan oksigen berlaku di alveolus.

.....
.....
.....

[2 marks]
[2 markah]

3 (c)(ii)

(d) A hard mass of food passing down the oesophagus might indirectly interrupt the air supply to lung by pressing on P.

Explain how P overcome this problem.

Makanan pejal yang keras yang melalui esophagus mungkin secara tidak langsung mengganggu aliran udara ke paru dengan menekan ke atas P. Terangkan bagaimana P mengatasi masalah ini.

.....
.....
.....

[2 marks]
[2 markah]

3 (d)

TOTAL

- 4 Diagram 4 shows the human karyotype for individual M and N, and the gametes that can be produced through process P.
Rajah 4 menunjukkan kariotip manusia bagi individu M dan N, dan gamet-gamet yang boleh terhasil melalui proses P.

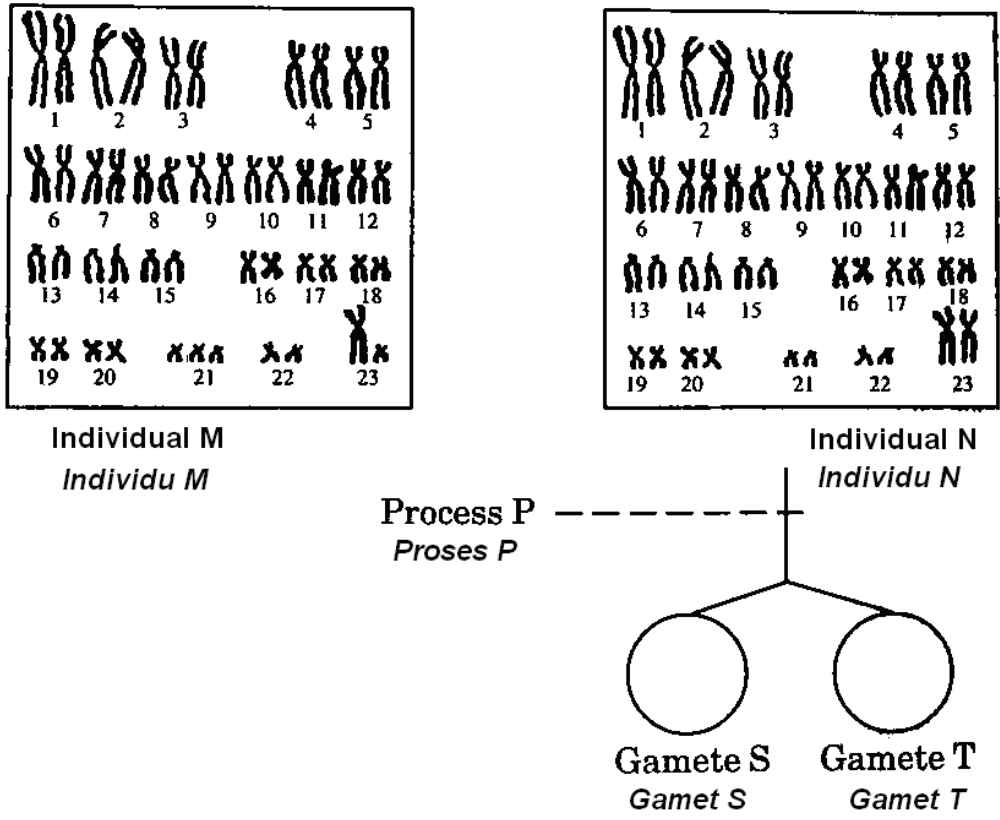


Diagram 4
Rajah 4

Based on the human karyotype in Diagram 4 :
Berdasarkan kariotip manusia dalam Rajah 4 :

- (a) (i) State the total chromosome number in a somatic cell for individual M and individual N.
Nyatakan jumlah bilangan kromosom dalam satu sel soma bagi individu M dan individu N.

.....
 [1 mark]
 [1 markah]

4 (a)(i)

- (ii) State **one** difference between individual M and N .
*Nyatakan **satu** perbezaan di antara individu M dan N.*

.....
 [1 mark]
 [1 markah]

4(a)(ii)

- (b) (i) S and T represent the gametes produced through process P.
 Complete Diagram 4 to show the number and type of chromosomes inherited by gamete S and T.
*S dan T mewakili gamet-gamet yang terhasil melalui proses P.
 Lengkapkan Rajah 4 untuk menunjukkan nombor dan jenis kromosom yang diwarisi oleh gamet R dan T.*

[2 marks]
[2 markah]

4(b)(i)

- (ii) Based on your answer in (b) (i), explain the process P.
Berdasarkan jawapan anda dalam (b) (i), terangkan proses P

.....

[2 marks]
[2 markah]

4(b)(ii)

- (c) Based on your biological knowledge, describe how the karyotype for individual M is formed.
Berdasarkan pengetahuan biologi anda, huraikan bagaimana kariotip untuk individu M terbentuk.

.....

[4 marks]
[4 markah]

4(c)

- (d) Explain the type of variation shown by individual M and N.
Terangkan jenis variasi yang ditunjukkan oleh individu M dan N.

.....

[2 marks]
[2 markah]

4(d)

TOTAL

- 5 Diagram 5 shows prenatal development of a human embryo.
Rajah 5 menunjukkan perkembangan pranatal bagi embrio manusia.

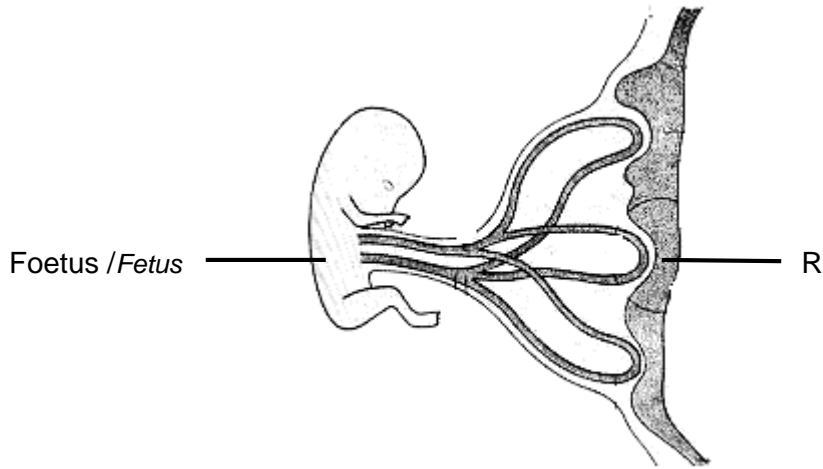


Diagram 5
Rajah 5

- (a)(i) Name **two** materials that pass via R from mother to the foetus.
*Namakan **dua** bahan yang merentasi R daripada ibu ke fetus.*

1:

2:.....

[2 marks]
 [2 markah]

5 (a)(i)

- (ii) Name **two** materials in blood of mother that are partially prevented by R from entering the blood of foetus.
*Nyatakan **dua** bahan dalam darah ibu yang dihalang tetapi tidak sepenuhnya oleh R dari memasuki darah fetus.*

1:.....

2:.....

[2 marks]
 [2 markah]

5(a)(ii)

- (b) Explain how the structure of R enable a rapid exchange of materials to take place.
Terangkan bagaimana struktur R membenarkan pertukaran bahan dengan cepat.

.....

.....

.....

[2 marks]
 [2 markah]

5(b)

(c) State **two** differences between the content of R and foetal blood.
Nyatakan dua perbezaan kandungan dalam R dengan kandungan darah foetus.

- 1.
-
- 2.
-

[2 marks]
[2 markah]

5(c)

(d) R regress and cause miscarriage.
R merosot dan menyebabkan keguguran.

Explain the above statement.
Terangkan pernyataan di atas.

-
-
-

[2 mark]
[2 markah]

5(d)

(e) Explain why colostrums valuable to the baby immediately after birth.
Terangkan mengapa kolostrum sangat penting untuk bayi seurus dilahirkan.

-
-
-

[2 marks]
[2 markah]

5(e)

TOTAL

SECTION B

Bahagian B

[40 marks]

[40 markah]

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

6. (a) Diagram 6.1 shows the cell structure of leaf. Diagram 6.2 shows the organelle M in that cell.
Rajah 6.1 menunjukkan struktur sel daun. Rajah 6.2 menunjukkan organel M dalam sel tersebut.

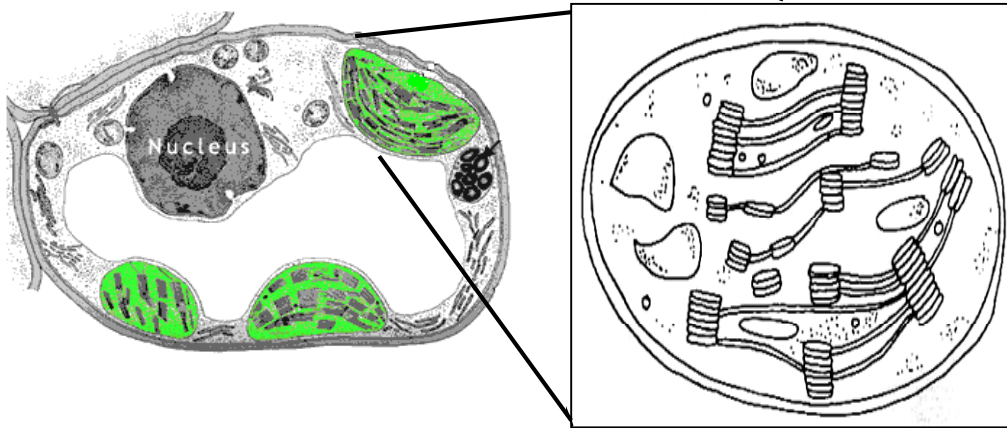


Diagram 6.1
Rajah 6.1

Diagram 6.2
Rajah 6.2

Describe the mechanisms in organelle M that involved in the formation of starch in the plant.
Huraikan mekanisme dalam organel M yang terlibat dalam pembentukan kanji dalam tumbuhan.

[10 marks]
 [10 markah]

- (b) Table 1 shows a daily food intake by a teenager.
Jadual 1 menunjukkan pengambilan makanan harian seorang remaja.

Breakfast / sarapan	Lunch / makan tengahari	Dinner/makan malam
Full cream milk <i>Susu penuh krim</i>	Fried noodles <i>Mee goreng</i>	Pasta with cream sauce <i>Pasta dengan sos krim</i>
Fried egg <i>Telur goreng</i>	Fried chicken <i>Ayam goreng</i>	Cream of mushroom soup <i>Sup cendawan berkrim</i>
Fried sausage <i>Sosej goreng</i>	Ice cream <i>Ais krim</i>	Cheese Cake <i>Kek keju</i>
	Carbonated soft drink <i>Minuman berkarbonat</i>	

Table 1
Jadual 1

- (i) Suggest **two** health problems which that teenager could have if she continuously taking the above menu for a long time. Explain your answers.
*Cadangkan **dua** masalah kesihatan yang dihadapi oleh remaja tersebut sekiranya ia mengambil menu itu dalam jangka masa panjang. Terangkan jawapan anda.*

[4 marks]
[4 markah]

- (ii) Explain ways to improve daily food intake by stating the reasons for your choice of food.
Terangkan cara-cara memperbaiki pengambilan makanan dengan menyatakan alasan pemilihan tersebut.

[6 marks]
[6 markah]

7. (a)(i) What is meant by *cloning*?
Apakah yang dimaksudkan dengan pengklonan?

[2 marks]
[2 markah]

- (a)(ii) Describe **one** cloning technique to produce a commercial plant of desirable characteristics
*Jelaskan **satu** contoh teknik pengklonan yang boleh digunakan untuk menghasilkan tumbuhan komersial yang mempunyai ciri-ciri yang dikehendaki.*

[6 marks]
[6 markah]

(b)

The hormone insulin used by present day diabetics is the result of genetic engineering technology. This hormone which was used to treat diabetics since 1982 is the first technological product approved for the market.
Hormone insulin yang digunakan oleh pesakit diabetis adalah hasil dari teknologi kejuruteraan genetik. Hormon yang telah digunakan sejak 1982 adalah produk teknologi pertama yang dibenarkan yang dibenarkan untuk pasaran.

- Based on above information, discuss the benefits of genetic engineering method in producing products for the society.
Berdasarkan maklumat di atas, bincangkan kebaikan teknik kejuruteraan genetik dalam menghasilkan keperluan masyarakat.

[6 marks]
[6 markah]

(c) Diagram 7.1 shows a group of cells that is exposed to ultraviolet ray.
Rajah 7.1 menunjukkan sekumpulan sel yang terdedah kepada sinar ultraviolet.

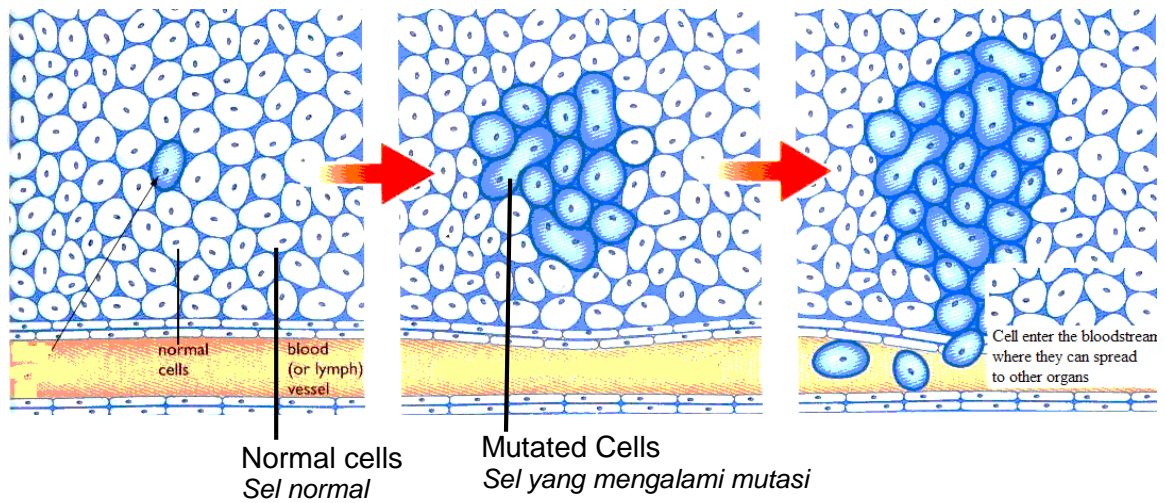


Diagram 7.1
Rajah 7.1

The exposure drives the cell cycle malfunctions. Based on the Diagram 7.1 describe effect of cell cycle malfunctions to the body.
Pendedahan kepada sinar radioaktif menyebabkan kitar sel tidak berfungsi. Berdasarkan Rajah 7.1, huraikan kesan kitar sel yang tidak berfungsi ke atas badan.

[6 marks]
[6 markah]

8. Diagram 8.1 shows the movement of water from root to the leaves and out to the atmosphere.
Rajah 8.1 menunjukkan pergerakan air dari akar ke daun dan terbebas ke atmosfera.

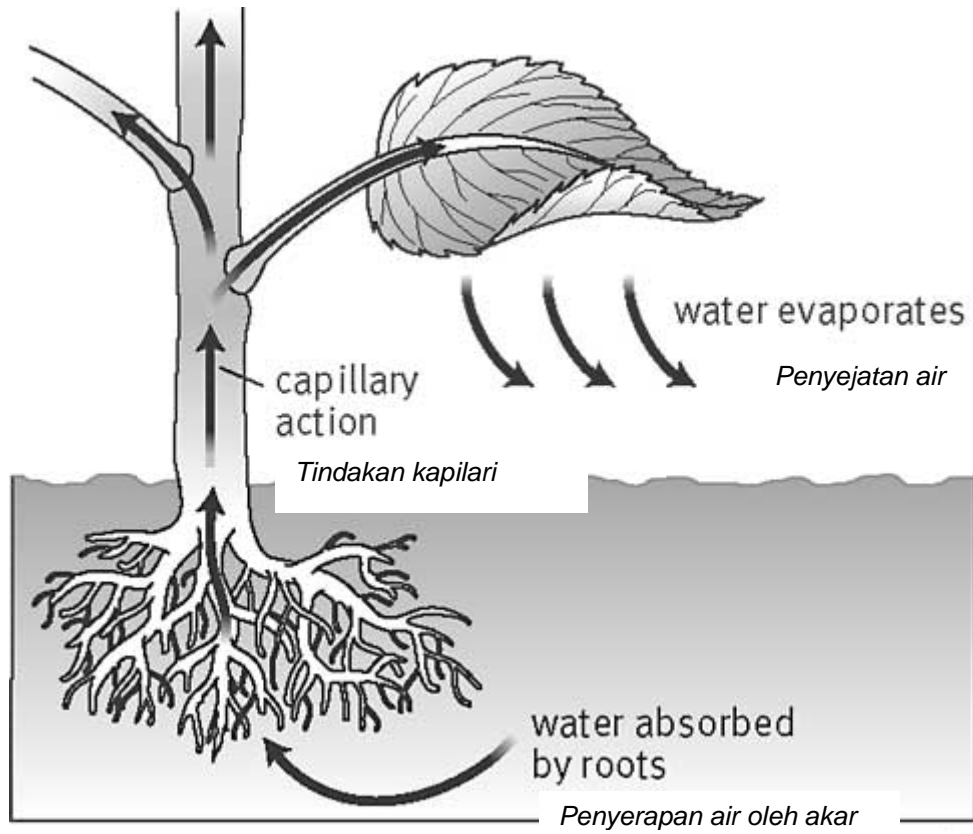


Diagram 8.1
Rajah 8.1

- (a) Based on Diagram 8.1, describe the movement of water from root to the leaves.
Berdasarkan Rajah 8.1, huraikan pergerakan air dari akar ke daun.

[10 marks]
[10 markah]

(b) Diagram 8.2 shows part of the blood circulatory system and the lymphatic system in the human body.

Rajah 8.2 menunjukkan system peredaran darah dan sistem limfa dalam badan manusia.

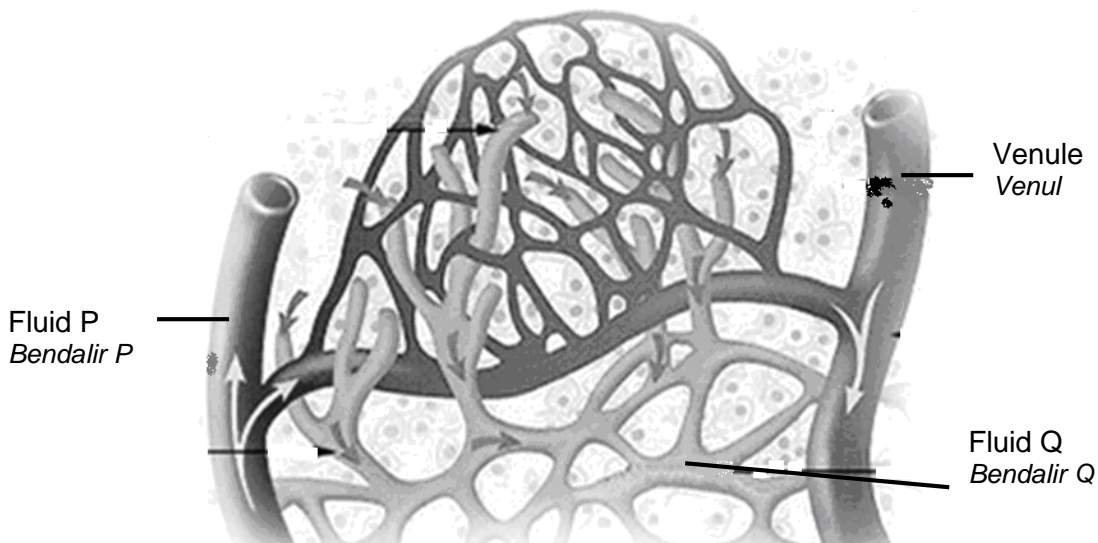


Diagram 8.2
Rajah 8.2

(i) Explain the differences between the composition of fluid P and fluid Q.
Terangkan perbezaan antara komposisi bendalir P dan bendalir Q.

[4 marks]
[4 markah]

(ii) Describe how fluid Q is formed from blood until it is brought back into the blood circulatory system.
Huraikan bagaimana bendalir Q terbentuk daripada darah sehingga bendalir tersebut masuk semula ke dalam sistem peredaran darah.

[6 marks]
[6 markah]

9. (a) Diagram 9.1 shows synapse while Diagram 9.2 shows reflex arc when hand touches a hot object.
Rajah 9.1 menunjukkan sinaps dan Rajah 9.2 menunjukkan arka refleks apabila tangan menyentuh objek panas.

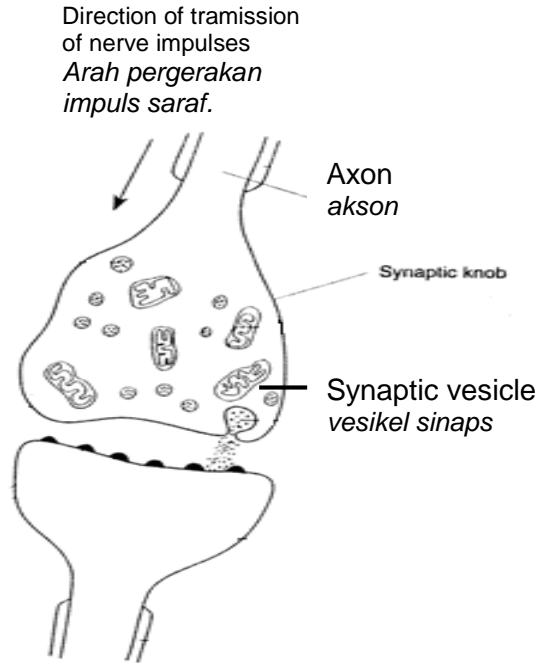


Diagram 9.1
Rajah 9.1

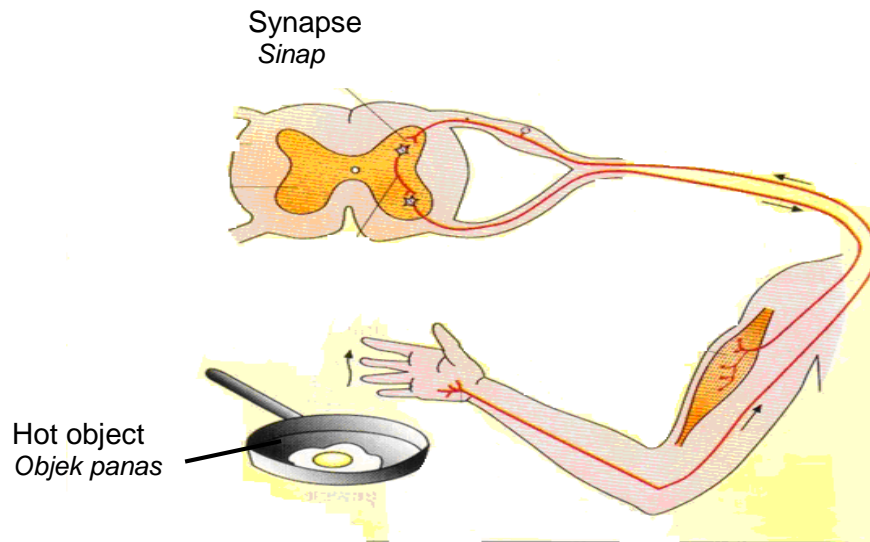


Diagram 9.2
Rajah 9.2

Based on Diagram 9.1 and 9.2 , explain the pathway of an impulse in a reflex arc shown in Diagram 9.2
Berdasarkan Rajah 9.1 dan 9.2, terangkan laluan impuls dalam arka refleks yang ditunjukkan dalam Rajah 9.2.

[8 marks]

- [8 markah]
- (b) (i) Explain with the help of diagram, how geotropism is brought about in a plant root and shoot.
Terangkan dengan bantuan rajah, bagaimana geotropisme berlaku dalam akar dan pucuk tumbuhan.
- [8 marks]
[8 markah]
- (ii) Explain the advantages of geotropism to a plant.
Terangkan kebaikan geotropisme kepada tumbuhan.
- [4 marks]
[4 markah]

END OF QUESTIONS

SULIT
4551/2
BIOLOGI
Peraturan Pemarkahan
Ogos
2009
2 ½ jam



BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2009

BIOLOGI
Kertas 2

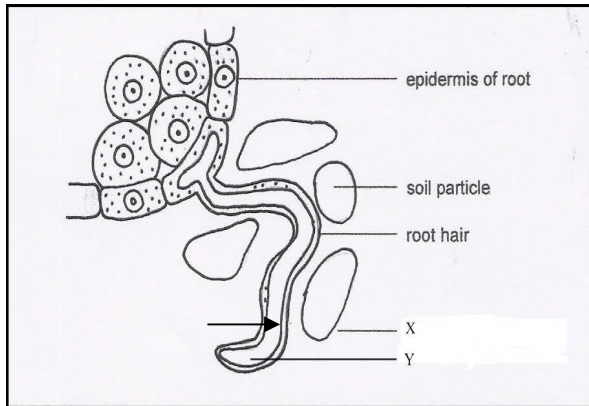
PERATURAN PEMARKAHAN

Untuk kegunaan pemeriksa sahaja

Peraturan Pemarkahan ini mengandungi 15 halaman bercetak

Answer scheme
Section A

Question 1

No	Marking Criteria	Marks	
(a)(i)	Able to name the process by which root hair cells absorb water. Answer : Osmosis	1	
(a) (ii)	Able to define the process in (a)(i) Sample answer: P1: (the net) movement of water molecules from a region of low solute concentration to a region of high solute concentration through a semi-permeable membrane // movement of water from hypotonic region to hypertonic region	1	2
(b) (i)	Able to identify the concentration of the region X and Y Answer : Y	1	
(ii)	Answer : X	1	2
(c)	Able to draw an arrow on diagram 1.1 to show the movement of water in a root hair cells of plant R. 	1	1
(d)	Able to predict and explain what will happen with plant R in a few days. Sample Answer: F1: Plant R will wilt P1: Excess of fertilizer causes the environment surrounding to be hypertonic to the cell sap P2: (a net) movement of water molecules from inside to outside of the cell by osmosis	1 1 1	3

(e)	Able to explain the processes occurring in both P and Q		
	<p>Sample Answer:</p> <p>P F1: fresh raw egg in P is floating. 1 P1: solution P is hypertonic to the cell sap of fresh raw egg. 1 P2: (a net) movement of water molecules from inside to outside of the cell by osmosis 1</p> <p style="text-align: right;">F with any P Max 2</p> <p>Q F2: fresh raw egg in Q sink 1 P3: solution P is hypotonic to the cell sap of fresh raw egg. 1 P4: (a net) movement of water molecules from outside to inside of the cell by osmosis 1</p> <p style="text-align: right;">F with any P Max 2</p>		4
TOTAL			12

Question 2

No	Marking Criteria	Marks	
(a)	Able to name vertebra in region P and R and state their specific structure characteristic . Sample Answer : P : Name : cervicle (vertebrae) 1 Characteristic : have (a pair of) transverse foramen 1 R : Name : Lumbar (vertebrae) 1 Characteristic : processes short /thick // large centrum 1		4
(b)	Able to explain the similarity. Sample answer : F1: both have several (bony spinous/ transverse) processes 1 P1: for muscle attachment 1 F2: both have facet / articulation surface 1 P2: to articulate with next vertebrae 1 F3: both have centrum 1 P3: to absorb shock/ provide support 1 F4: both have vertebral foramen 1 P4: to provide passage of spinal cord 1 <p style="text-align: right;">Any F with correspond P Max 2</p>		2
c (i)	Able to name structure S Answer : Intervertebral disc 1		
(ii)	Able to explain the function of structure S Sample answer :		

	F: permit movement of vertebral column P: absorb shock / reduce friction	1 1	3
d (i)	Able to give reason why eats plenty of dairy products is a good idea. Sample Answer : P: provide plenty of calcium (which help to reduce the effects of osteoporosis)	1	
(ii)	Able to state two possible disadvantages of having a hip replacement. Sample answer : P1: it may cause the surrounding tissue to become inflamed P2: Painful P3: dislocation /blood clot P4: risk of infection after surgery P5: her legs may not be exactly the same length P6: the artificial hip will eventually need replacing	1 1 1 1 1 1	
Any 2 P		Max 2	3
TOTAL		12	

Question 3

No	Marking Criteria	Marks	
(a)	Able to state one adaptation of alveolus for efficient gases exchange. Sample answer: F1 : one cell thick P1 : gas doesn't have far to diffuse //diffuse easily F2 : supply with network of blood capillary. P2 : to transport respiratory gases to /from all the body cells. Any F with correspond P	1 1 1 1	2
(b)(i)	Able to name P Sample answer : Trachea	1	
(ii)	Able to explain the role of P to prevent dirt and bacteria from entering the alveolus. Sample answer : F1 : secrete sticky fluid/mucus P1 : traps dirt / bacteria that are breathed in. F2 : cells in P have cilia / tiny hair-like structures P2 : sweeping the mucus out towards the mouth. Any F with correspond P	1 1 1 1	3
(c)(i)	Able to draw arrow. Sample answer : <i>Blood flow= arrow from blood capillary to other side of blood capillary</i> <i>Oxygen diffusion = arrow from alveolus to blood capillary // arrow</i>	1 1	

	<i>from blood capillary to cells</i>		
	<i>Carbon dioxide diffusion = arrow from blood capillary to alveolus // from cells to blood capillary</i>	1	
(ii)	Able to explain why the diffusion of oxygen occur. Sample answer : F: the partial pressure of oxygen in the air of the alveoli is higher compared to the partial pressure of oxygen in the blood capillary P: (therefore,) oxygen diffuses across the surface of the alveolus to the blood.	1 1	5
(d)	Able to explain how P overcome this problem. Sample answer : F : P/trachea is protected (against closure by a series of closely packed C-shaped) ring of cartilage P : cartilage keep the trachea open// prevent from collapse.	1 1	2
	TOTAL		12

Question 4

No	Marking Criteria	Marks	
(a)(i)	Able to state the total chromosome number in a somatic cell for individual M and individual N. Sample Answer Individual M - 47 , Individual N - 46	1	
(ii)	Able to state one difference between individual M and N. Sample answer D1: M – Syndrome Down whereas N is normal D2: M – male / XY sex chromosomes whereas N is a female / XX sex chromosomes D3: M – There are three chromosomes number 21 whereas in N - there are two chromosomes number 21 Any 1 D	1	2
(b) (i)	Able to write the number and type of chromosomes inherited by gamete Q, R and T. Sample answer Gamete S : 22 + X Gamete T : 22 + X	1 1	2
(b) (ii)	Able to explain process P Sample answer F: Process P is meiosis P: Each pair of homologous chromosomes are separated into different daughter cells	1 1	2
(c)	Able to describe how the karyotype for individual M formed.		

	<p>Sample answer P1: At metaphase 1 of meiosis, the homologous pairs of chromosomes are arranged on the metaphase plate (at random) P2: Each homologous pair separated and move to the opposite pole except chromosome number 21. P3: Both chromosomes number 21 move to one pole P4: One of the gamete contain 24 chromosomes and the other one gamete contain 22 chromosomes. P5: The gamete which contain 24 chromosomes been fertilized by normal gamete / gamete which contain 23 chromosomes.</p>	1 1 1 1 1	Max 4	4
(d)	<p>Able to explain the type of variation shown by individual M and N.</p> <p>Sample answer F : Discontinuous variation P : Effects of genetic factors // There is no gradual change between the two extreme / no intermediates. // not influenced by environmental conditions</p>	1 1		2
TOTAL			12	

Question 5

No	Marking Criteria	Marks	
(a)(i)	<p>Able to name the materials that can pass via placenta</p> <p>Sample answer: water / amino acid / glucose /nutrients / oxygen / antibodies Any two</p>	1 1	
(ii)	<p>Able to name the materials that partially prevented by placenta</p> <p>Sample answer : Drugs / alcohol / caffeine / nicotine / HIV / rubella virus Any two</p>	1 1	4
(b)	<p>Able to explain the adaptation of the structure R</p> <p>Sample answer : F1 : placenta has a large surface area to volume ratio. P1 : to increase exchange rate</p> <p>F2 : material and embryonic bloods are brought into close ontact. P2 : diffusion can take place efficiently</p> <p>F3 : separated only by a thin membrane P3 : diffusion can take place efficiently</p> <p style="text-align: right;">Any F with correspond P</p>	1 1 1 1	2
(c)	<p>Able to state the differences between the content of R and foetal blood</p>		

	<p>Sample answer :</p> <table border="1"> <tr> <td></td> <td>R</td> <td>Foetal blood</td> </tr> <tr> <td>Oxygen</td> <td>high</td> <td>low</td> </tr> <tr> <td>nutrient</td> <td>high</td> <td>low</td> </tr> <tr> <td>Carbon dioxide</td> <td>low</td> <td>high</td> </tr> <tr> <td>Waste / example</td> <td>Low</td> <td>high</td> </tr> </table> <p style="text-align: right;"><i>Any two</i></p>		R	Foetal blood	Oxygen	high	low	nutrient	high	low	Carbon dioxide	low	high	Waste / example	Low	high	1 1 1 1	2
	R	Foetal blood																
Oxygen	high	low																
nutrient	high	low																
Carbon dioxide	low	high																
Waste / example	Low	high																
(d)	<p>Able to explain the above statement.</p> <p>Sample answer : F : placenta acts as an endocrine gland // secreting oestrogen/progesterone. P : (these hormone) help to maintain a thickened / blood enriched endometrium throughout the pregnancy.</p>	1 1	2															
(e)	<p>Able to explain the importance of colostrums to newborn baby.</p> <p>Sample answer : F : colostrums contain antibodies P : to help infant / baby survive from pathogens .</p>	1 1	2															
TOTAL		12																

Question 6

No	Marking Criteria	Marks
(a) (i)	<p>Able to describe the mechanisms in organelle M that involved in the formation of starch in the plant.</p> <p>Sample answer :</p> <p>P1: The formation of starch in plants is by the process of photosynthesis which occurs in chloroplasts.</p> <p>P2: The two stages in photosynthesis are the light and dark reactions.</p> <p>Light reaction: P3: Takes place in grana.</p> <p>P4: Chlorophyll captures light energy which excites the electrons of chlorophyll molecules to higher energy levels.</p> <p>P5: In the excited state, the electrons can leave the chlorophyll molecules.</p>	1 1 1 1 1

	<p>P6: Light energy is also used to split water molecules into hydrogen ion (H⁺) and hydroxyl ions (OH⁻) (Photolysis of water).</p> <p>P7: The hydrogen ions then combine with the electrons released by chlorophyll to form hydrogen atoms.</p> <p>P8: The energy from the excited electrons is used to form energy-rich molecules of adenosine triphosphate /ATP.</p> <p>P9: Hydroxyl ion loses an electron to form a hydroxyl group. This electron is then received by chlorophyll.</p> <p>P10: The hydroxyl groups then combine to form water and gaseous oxygen.</p> <p>Dark Reaction:</p> <p>P11: Take place in stroma.</p> <p>P12: Do not require light energy.</p> <p>P13: The hydrogen atoms are used to fix carbon dioxide in a series of reactions catalysed by photosynthetic enzymes</p> <p>P14: and caused the reduction of carbon dioxide into glucose.</p> <p>P15: The glucose monomers then undergo condensation to form starch which is temporarily stored as starch grains in the chloroplasts.</p> <p style="text-align: right;">any 10P</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>10</p>
(b)(i)	<p>Able to suggest two health problems which that teenager could have if she continuously taking the above menu for a long time.</p> <p>Sample answer :</p> <p>F1: Chronic heart disease</p> <p>P1: Her diet contains large amounts of oil/cream/fat and it causes arteriosclerosis / atherosclerosis / heart problem / cardiovascular disease.</p> <p>F2: Constipation.</p> <p>P2: Lack of fruit/vegetables / fibers leads to constipation.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>4</p>
(b)(ii)	<p>Able to explain ways to improve daily food intake and stating the reasons for the choice of food.</p> <p>Sample answer :</p> <p>P1: Drink scheme milk/low fat milk and eat a boiled egg to reduce the cream and fat from her diet</p>	<p>1</p>	

	P2: Replace sausage with an orange to increase her fruit fibre intake	1	
	Lunch:		
	P3: Drink fresh fruit juice because it has lower sugar content/more vitamins	1	
	P4: Eat steamed rice/steamed chicken to lower cholesterol intake	1	
	P5: Eat vegetable/salad to increase the amount of roughage	1	
	Dinner:		
	P6: Drink clear soup to reduce the cholesterol	1	
	P7: Use tomato sauce with her pasta because it contains less fat and more fibers.	1	
	P8: Eat a slice of watermelon/any fruits to increase her intake of fiber to prevent constipation	1	
	Any 6		6
	TOTAL		20

Question 7

No	Marking Criteria	Marks	
(a)	<p>Able to explain what cloning is :</p> <p>Sample answer :</p> <p>P1 : Cloning is an asexual reproductive process of producing clones//does not involve gamete</p> <p>P2 : A clone is a group of cells//organism//a population of organisms produced from a single ancestral cell.</p> <p>P3 : A clones genetically identical</p> <p>P4 : The technique can be used to produce high quality of organism / orchids/ oil palm / cocoa plants.</p> <p style="text-align: right;"><i>Any 2 P</i></p>	1	1
		1	1
		1	1
		1	1
			2
(b)	<p>Able to describe tissue culture technique.</p> <p>Sample answer:</p> <p>P1 : Tissue culture technique</p> <p>P2 : Tissue culture technique is used to produce (high quality of seedling)oil palm seedlings in vitro/any suitable example.</p> <p>P3 : The leaves/shoot/stem/root tissues are cut out.(These cut out plant tissues are called explants).</p> <p>P4 :The pieces of meristematic tissue (explants) are cultured in sterile nutrient medium, in suitable pH and with addition of plant growth substances.(at least 2 factors)</p>	1	1
		1	1
		1	1
		1	1

	<p>P5 : The flasks containing the tissue are stored in an incubator at 37°C for 2/3 weeks.</p> <p>P6 : The cell divide by mitosis to produce callus.</p> <p>P7 : The callus is then cut into small pieces.</p> <p>P8 : The small pieces of callus tissues are then cultured in sterile nutrient medium.</p> <p>P9 : When it has grown to a suitable size, the clone is transferred to the nursery.</p> <p style="text-align: right;">Any 6 P</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>6</p>
(b)	<p>Able to discuss Advantages / strength:</p> <p>P1 : Genetic engineering involves genes manipulation / transfer / modification in organisms to produce certain products.</p> <p>P2 : Example; products in pharmacy such as insulin / antibiotics; food products based on plants / animals; agricultural / agrochemical products.</p> <p>P3 : The products produced are very similar to the original / natural materials because the same genes are used / particularly chosen genes are transferred.</p> <p>P4 : The production of products is faster especially with the use of microorganisms/bacteria.</p> <p>P5 : Microorganisms such as bacteria are suitable to be used as gene vectors / they have free DNA in the form of ring / plasmid.</p> <p>P6 : High reproduction rate of bacteria/microorganism in optimal culture mediums able to produce a large amount of chosen genes / products / insulin / antibiotics.</p> <p>P7 : Can be used by thousands of people who need them / widespread usage.</p> <p>P8 : Able to produce a variety of proteins / recombinant proteins / enzymes used in food industries / medicine / agriculture.</p> <p>P9 : Genetic engineering technique is used to solve criminal cases through DNA finger printing / DNA fragments analysis.</p> <p>P10 : Other uses /examples; metal extraction from oxide/any suitable examples</p> <p style="text-align: right;">Any 6 P</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>6</p>

(c)	<p>Able to describe the effect of cycle malfunctions to the body.</p> <p>Sample answer</p> <p>P1: The exposure damage the DNA of the cell</p> <p>P2: A cell divides through mitosis repeatedly.</p> <p>P3: Produces cancerous cell</p> <p>P4: Due to (severe) distruption to the mechanism that controls the cell cycle</p> <p>P5: Cancerous cells divide freely / uncontrollably heeding the cell cycle control</p> <p>P6: (these cells) compete with surrounding normal cells to obtain nutrient / energy (for growth)</p> <p>P7: Invade / destroy neighbouring cells</p> <p>P8: (they can spread to other organ and) initiate cancers there .</p> <p style="text-align: right;">Any 6 P</p>	1	1	1	1	1	1	6	
TOTAL							20		

Question 8

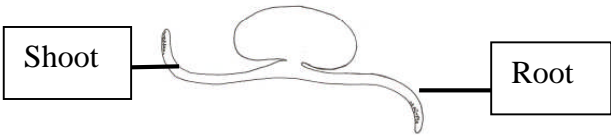
No	Marking Criteria			Marks		
(a)	<p>Able to describe the movement of water from root to the leaf which aided by :</p> <ol style="list-style-type: none"> 1. Root pressure 2. Capillary action 3. Transpirational pull <p>Sample answer:</p> <p><u>Root pressure</u></p> <p>P1: The cell sap of root hair (usually) hypertonic to the surrounding soil solution</p> <p>P2: Water diffuses into the root by osmosis.</p> <p>P3: (As they absorb more water by osmosis), a cell sap becomes more dilute compared to neighbouring cells.</p> <p>P4: Water (therefore) moves to these adjacent cells which become more diluted themselves, so osmosis continues across the cortex</p> <p>P5: (At the same time), ions from the soil are actively secreted</p>	1	1	1	1	1

	<p>into the xylem vessels and this causes osmotic pressure to increase</p> <p>P6: Water flows continuously into the xylem and this create a pressure known as root pressure</p> <p>P7: Root pressure gives an initial upward force to water and mineral ions in the xylem vessels</p> <p>Capillary action</p> <p>P8 : Water moves up through the xylem in the stems by capillarity (with is the upward movement of a fluid in a narrow bore tube)</p> <p>P9: Capillary action is due to combined force of cohesion (water molecule have attraction for each other) and adhesion (water molecules are attracted to the side of the vessels)</p> <p>P10: Water molecule form a continuous water column in the xylem vessel (due to cohesion and adhesion force enable water to move up along the xylem vessels)</p> <p>P11: (As water is pulled upwards) the cohesion of water (which is due to hydrogen bonding holds the water molecule together) prevent the water column in the xylem breaking apart</p> <p>P12: (At the same time) the adhesion of the water (to the wall of the xylem vessel and tracheids) prevents gravity from pulling the water down the column</p> <p>Transpirational pull</p> <p>P13: The lost of water from the mesophyll cells during transpiration is replaces by water which flows in from the xylem vessels in the leaves</p> <p>P14: This creates a tension / suction force in the water column because water has cohesive properties called transpiration pull</p> <p>P15: The transpiration pull draws water from the xylem in the leaves/stems/roots.</p> <p>P16: The continuous flow of water through the plant is known as the transpiration stream</p>	<p>1</p> <p>1</p> <p>Max 4</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>Max 4</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>Max 2</p>	<p>4</p> <p>4</p> <p>2</p>
b (i)	<p>Able to explain the diffrences of composition fluid P and fluid Q</p> <p>Sample answer:</p> <p>F1: Fluid Q/lymph has a larger numbers of lymphocyte compare to fluid P/blood</p> <p>P1: lymphocyte is produced by the lymph nodes in lymph system</p>	<p>1</p> <p>1</p>	

	F2: Fluid Q/lymph has lower contents of oxygen compare to fluid P/blood P2: oxygen has been used up by the cell	1 1	4
b(ii)	Able to describe how lymph is formed from blood until it is brought back into the blood circulatory system. Sample Answer : P1: (When the blood flows from arteries into capillaries)there is higher hydrostatic pressure at the arterial end of the capillaries P2: (This high pressure) forces some plasma to pass through the capillary walls into the intercellular spaces (between the cells) P3: Once the fluid leaves the capillary walls, it is called interstitial/tissue fluid // The interstitial fluid fills the spaces between the cells and constantly bathes the cells P4: 90% of the interstitial fluid diffuses back into blood capillary P5: 10% of the interstitial fluid that has not been reabsorbed into the bloodstream goes into the lymph capillaries.(Once inside the lymph capillaries) the fluid is known as lymph. P6: The lymph capillaries unite to form larger lymphatic vessels. P7: From the lymphatic vessels, lymph eventually passes into the thoracic duct/the right lymphatic duct. P8:The thoracic duct empties its lymph into the right subclavian vein. (Hence, lymph drains back into the blood). <i>Any 6 P</i>	1 1 1 1 1 1 1	6 Max 6
TOTAL			20

Question 9

No	Marking Criteria	Marks
(a)	Able to state the Sequence of events that occur when the hand touches a hot object. Sample answer : P1: the heat on the object stimulates the nerve endings (receptors) in the skin. P2: impulses are triggered. P3: This impulses travel along the sensory/afferent neurone to the spinal cord.	1 1 1

	<p>P4: in the spinal cord, the impulses are transmitted first across a synapse to the interneurone and then across another synapse to the motor/efferent neurone. (<i>at least 2 type of neurone</i>)</p> <p>At synapse</p> <p>P5: When an impulse reach a presynaptic membrane, it triggers the synaptic vesicles to release neurotransmitter into the synaptic cleft.</p> <p>P6 The neurotransmitter diffuse across the synaptic cleft</p> <p>P7: and bind to receptors which are attached to the postsynaptic membrane.</p> <p>P8: The binding of the neurotransmitter to the receptors leads to the generation of a new impulse</p> <p>P9: Impulses leave the spinal cord along the motor/efferent neurone to the effector</p> <p>P10: the effector is the biceps muscle which then contracts. This brings about a sudden withdrawal of the hand.</p> <p style="text-align: right;">Any 8 P</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>8</p>
<p>(b) (i)</p>	<p>Able to explain how geotropism is brought about in a plant root and shoot.</p> <p>Sample answer : Diagram :</p> <div style="text-align: center;">  </div> <p>Correct Diagram (shoot grows upward, root grow downward): 1 m</p> <p>Shoot</p> <p>P1 : The auxin that is produced at the tip of shoot.</p> <p>P2 : auxin moves downward/ accumulate on the underside of the shoot tip due to the pull of gravity.</p> <p>P3 : the high concentration of auxin accelerates the growth</p> <p>P4 : stimulating greater cell elongation on the underside relative to the cells on the upper side.</p> <p>P5 : this differential elongation causes the shoot to bend away from gravity / grow downwards.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>1</p>

	<p>Root P6 : The auxin that is produced at the tip of root. P7 : auxin moves downward/ accumulate on the underside of the root tip due to the pull of gravity. P8 : the high concentration of auxin inhibits the growth P9 : slowing down cell elongation on the underside relative to the cells on the upper side. P10 : this differential elongation causes the shoot to bend towards gravity / grow downwards. <p style="text-align: right;">Any 7 P</p> </p>	<p>1 1 1 1 1</p>	<p>7</p>																
(b)(ii)	<p>Able to explain the advantages</p> <p>Sample answer</p> <table border="1" data-bbox="352 846 1206 1256"> <thead> <tr> <th></th> <th>Advantages</th> <th></th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>F1</td> <td>ensures the root grow/penetrate deep into soil</td> <td>P1</td> <td>To anchor the plant firmly in the ground</td> </tr> <tr> <td>F2</td> <td>The roots always contact with the soil water/mineral/nutrients</td> <td>P2</td> <td>To maintain turgor pressure/ growth/ photosynthesis</td> </tr> <tr> <td>F3</td> <td>Ensure that the leaves of shoot growth towards sunlight</td> <td>P3</td> <td>To absorb maximum amount of light energy for photosynthesis.</td> </tr> </tbody> </table> <p style="text-align: right;">Any 2 F with correspond P</p>		Advantages		Explanation	F1	ensures the root grow/penetrate deep into soil	P1	To anchor the plant firmly in the ground	F2	The roots always contact with the soil water/mineral/nutrients	P2	To maintain turgor pressure/ growth/ photosynthesis	F3	Ensure that the leaves of shoot growth towards sunlight	P3	To absorb maximum amount of light energy for photosynthesis.	<p>1 1 1 1 1 1</p>	<p>4</p>
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END OF MARKING SCHEME