KEMENTERIAN PENDIDIKAN MALAYSIA

BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH DAN SEKOLAH KECEMERLANGAN

PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2014
PERCUBAAN SIJIL PELAJARAN MALAYSIA

BIOLOGY

Kertas 1

Dua jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

Arahan:

1. Kertas soalan ini adalah dalam dwibahasa.
2. Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.
3. Kertas soalan ini mengandungi **50 soalan**.
4. Jawab **semua** soalan.
5. Jawab setiap soalan dengan menghitamkan ruangan yang **betul** dalam helaian jawapan.
6. Hitamkan **satu** ruangan sahaja bagi setiap soalan.
7. Sekiranya anda ingin mengubah jawapan anda, padamkan tanda hitam yang telah dibuat. Kemudian hitamkan ruangan untuk jawapan baharu.
8. Rajah yang diberikan dalam soalan tidak dilukiskan mengikut skala melainkan diberitahu.
9. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

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

1 The following statements are the characteristics of organelle P.
Pernyataan berikut merupakan ciri-ciri bagi organel P.

- Has a double membrane
  Terdapat dua lapisan membran
- Interior contain aqueous solution that has enzyme
  Di bahagian dalam mengandungi larutan akues berenzim
- Site for aerobic respiration
  Tapak respirasi aerob

What is organelle P?
Apakah organel P?

A Vacuole
Vakuol

B Chloroplast
Kloroplas

C Ribosome
Ribosom

D Mitochondrion
Mitokondria

2 Diagram 1 shows a type of animal tissue.
Rajah 1 *menunjukkan sejenis tisu haiwan.*

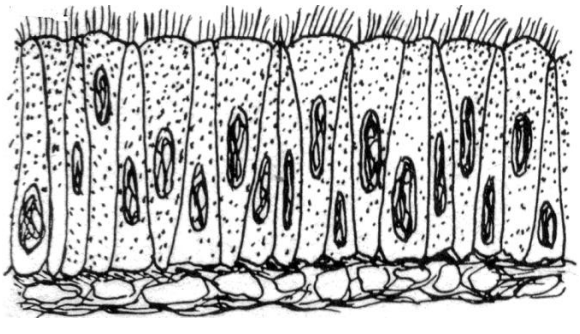


Diagram 1
Rajah 1

What is the tissue?
Apakah tisu ini?

A Epithelial tissue
Tisu epitelium

B Connective tissue
Tisu penghubung

C Muscle tissue
Tisu otot

D Nerve tissue
Tisu saraf

3 Pak Samad sprayed excessive fertiliser to his long bean plant with hopes that the plant will produce more fruits. Few days later, he found that the plant becomes wilt.

Pak Samad menyembur baja berlebihan kepada pokok kacang hijaunya dengan harapan ia akan berbuah lebih lebat. Beberapa hari kemudian, dia mendapati pokok tersebut layu.

What causes the long bean plant to wilt?
Apakah yang menyebabkan pokok kacang panjang itu layu?

A Water from the plant root diffuse into the soil by osmosis
Air daripada akar pokok kacang meresap ke dalam tanah secara osmosis

B Fertilizer diffuse into the root
Baja meresap masuk ke dalam akar

C Root uses too much energy to transport the fertiliser into the cell
Akar menggunakan terlalu banyak tenaga untuk mengangkut baja ke dalam sel

D Dissolve fertiliser diffuse from the soil into the root
Baja terlarut meresap daripada tanah ke dalam akar

4 Diagram 2 shows cell organisation in a multicellular organism.
Rajah 2 menunjukkan organisasi sel pada organisma multisel.

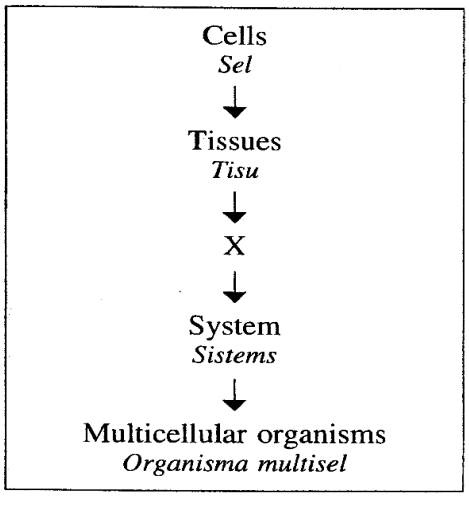
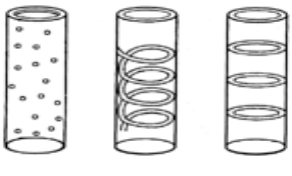


Diagram 2
Rajah 2

Which is an example of X?
Manakah satu contoh bagi X?

A

B



C

D

5 Diagram 3 shows a cross section of the human blood vessels surrounding the tissues.
Rajah 3 *menunjukkan keratan rentas salur darah manusia.*

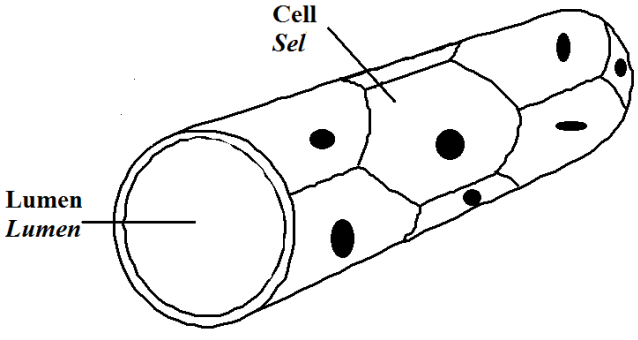


Diagram 3
Rajah 3

Based on the diagram, what is the special characteristic of the blood vessel to carry out its function efficiently?
Apakah ciri istimewa pada salur darah yang membolehkan ia berfungsi secara efisien?

A Large surface area
Luas permukaan besar

B One cell thick wall
Dinding setebal satu sel

C Moist surface
Permukaan yang lembap

D Circular shape
Berbentuk bulat

6 Diagram 4 shows an experiment to investigate the changes of sucrose solution in a Visking tubing.
Rajah 4 menunjukkan eksperimen untuk mengkaji perubahan kepekatan sukrosa dalam tiub Visking.

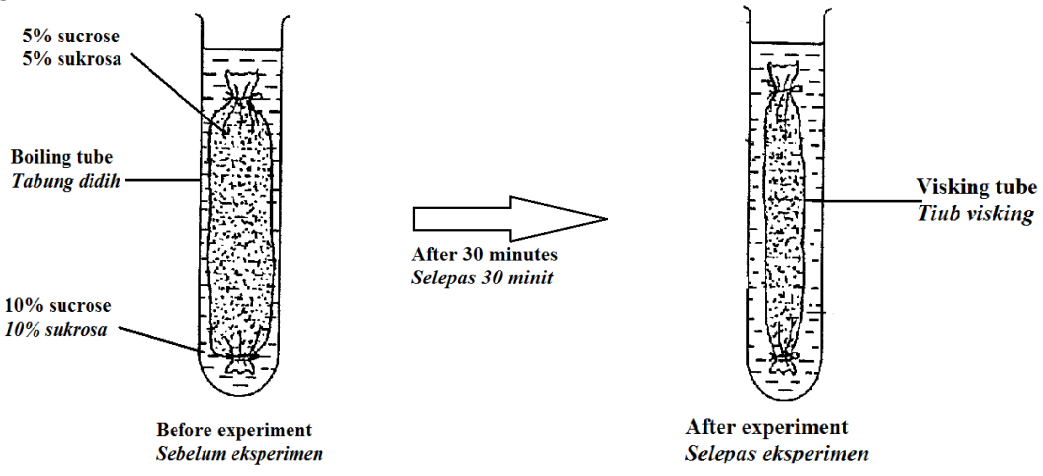
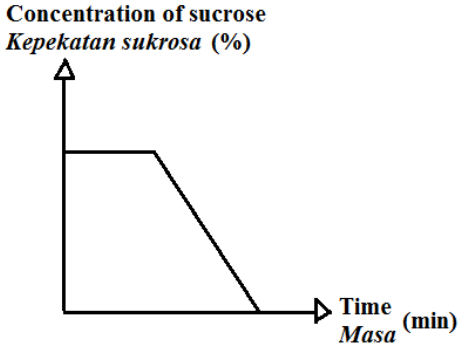


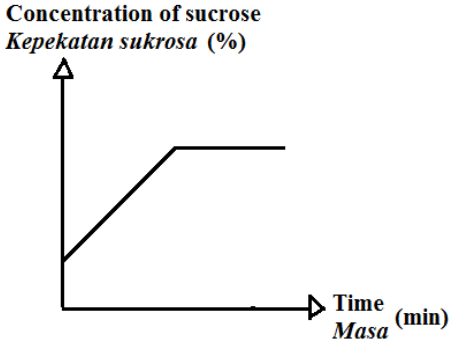
Diagram 4
Rajah 4

Which of the following graphs **A, B, C** or **D** represents the change?
Antara graf **A, B, C** *atau* **D** *berikut, yang manakah mewakili perubahan itu?*

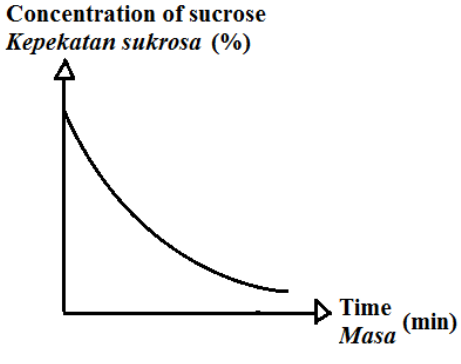
A



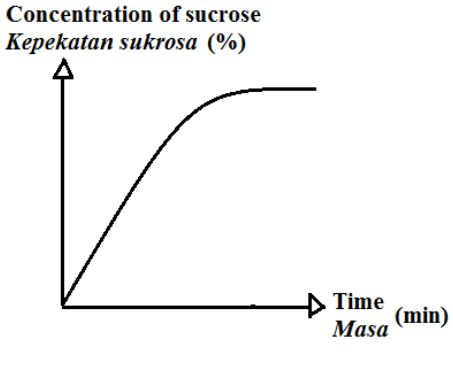
B



C



D



7 Which type of carbohydrate is found in abundance in the liver cells?
Apakah jenis karbohidrat yang banyak disimpan di dalam sel hati ?

A Starch
kanji

B Sucrose
sukrosa

C Glycogen
Glikogen

D Glucose
Glukosa

8 Diagram 5 shows the molecular structure of two classes of food.
Rajah 5 menunjukkan struktur molekul bagi dua jenis kelas makanan.

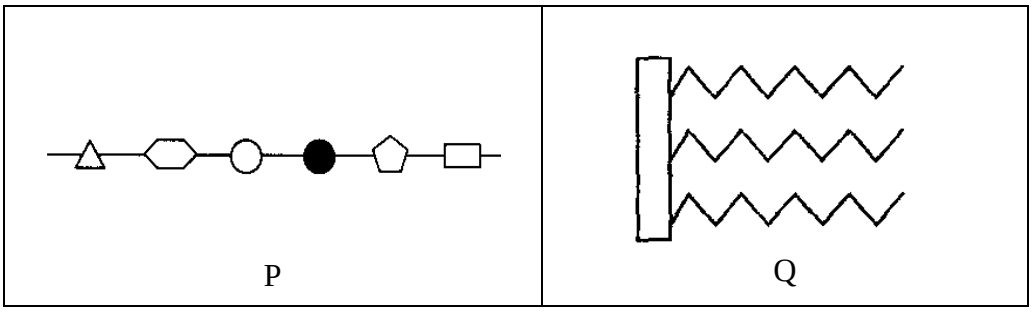


Diagram 5
Rajah 5

What are the food classes of P and Q?
Apakah kelas makanan bagi molekul P *dan* Q*?*

	P	Q
A	Protein *Protein*	Lipid *Lipid*
B	Carbohydrate *Karbohidrat*	Protein *Protein*
C	Lipid *Lipid*	Carbohydrate *Karbohidrat*
D	Protein *Protein*	Carbohydrate *Karbohidrat*

9 Diagram 6 shows the set up of an experiment to study the hydrolysis of albumen. The contents of the test tubes **A**, **B**, **C** and **D** are given in the table.
Rajah 6 *menunjukkan susunan bahan dan radas bagi eksperimen untuk mempelajari mengenai proses hidrolisis albumin. Kandungan pada tabung uji* **A**, **B**, **C** *dan* **D** *adalah seperti didalam jadual.*

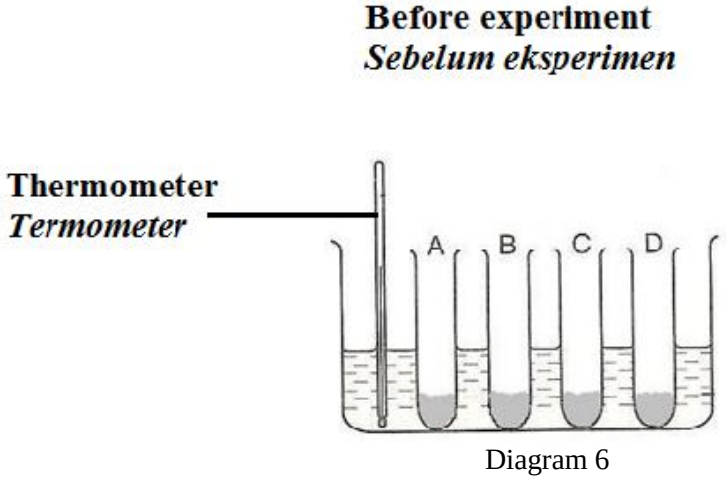


Diagram 6
Rajah 6

The experiment is left for 20 minutes. Which of test tube shows the albumen had been hydrolysed?
Eksperimen dibiarkan selama 20 *minit. Tabung uji yang manakah menunjukkan albumin telah di hidrolisis?*

Test Tube *Tabung uji*	Content *Kandungan*
A	2 ml albumen solution + 1 ml pepsin 2 ml *larutan albumin* + 1 ml *pepsin*
B	2 ml albumen solution + 1 ml distilled water 2 ml *larutan albumin* + 1 ml *air suling*
C	2 ml albumen solution + 1 ml pepsin + 3 drops hydrochloric acid 2 ml *larutan albumin* + 1 ml *prpsin* + 3 *titis asid hidroklorik*
D	2 ml albumen solution + 1 ml distilled water + 3 drops hydrochloric acid 2 ml *larutan albumin* + 1 ml *air suling* + 3 *titis asid hidroklorik*

10 Diagram 7 shows the phases in a cell cycle.
Rajah 7 *menunjukkan fasa-fasa dalam satu kitar sel*.

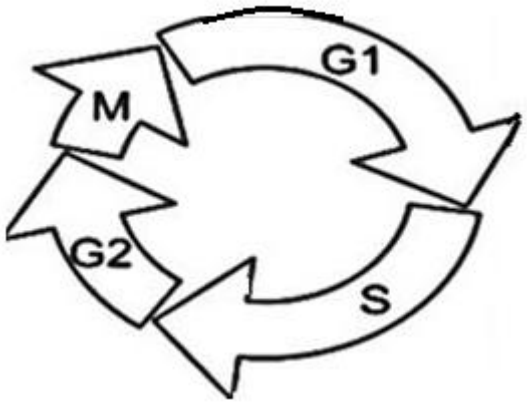


Diagram 7
Rajah 7

Which phase do synthesis of mitochondria and chloroplasts occur?
Antara fasa berikut yang manakah berlakunya sintesis mitokondrion dan kloroplas?

A G1 **B** G2

C S **D** M

11 Diagram 8 shows cells at different stages of mitosis.
Rajah 8 *menunjukkan sel-sel dalam peringkat mitosis yang berbeza.*

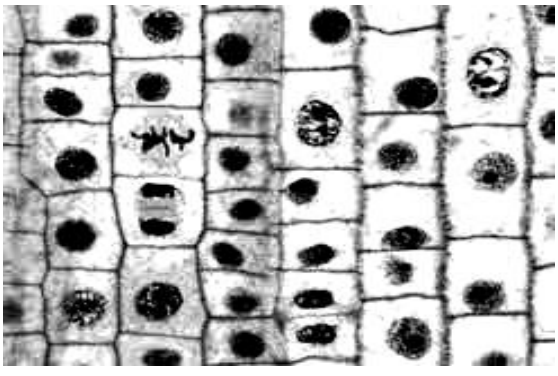


Diagram 8
Rajah 8

Which of the following tissues contains these cells?
Antara tisu-tisu berikut, yang manakah mengandungi sel-sel tersebut?

A The epidermal tissue
Tisu epidermis

B The meristem tissue
Tisu meristem

C The phloem tissue
Tisu floem

D The ground tissue
Tisu asas

12 Table 1 shows the number of chromosomes in the liver cell of several animals
Jadual 1 menunjukkan bilangan kromosom yang terdapat pada sel hati beberapa jenis haiwan

Chicken *Ayam*	Goat *Kambing*	Elephant *Gajah*
78	60	56

Table 1
Jadual 1

What are the chromosomal number of their sperm cells?
Apakah bilangan kromosom bagi sel sperma haiwan-haiwan tersebut?

	Chicken *Ayam*	Goat *Kambing*	Elephant *Gajah*
A	78	60	56
B	26	20	18
C	39	30	28
D	20	15	14

13 When cellulose is digested by the protozoa in the caecum of a rodent, what is the final product absorb by the intestine?
Apabila selulosa dicernakan di dalam sekum roden oleh protozoa, apakah hasil akhir yang diserap di usus?

A Starch
Kanji

B Maltose
Maltosa

C Sucrose
Sukrosa

D Glucose
Glukosa

14 Diagram 9 shows the stomach chambers of a cow.
Rajah 9 *menunjukkan bahagian perut lembu.*

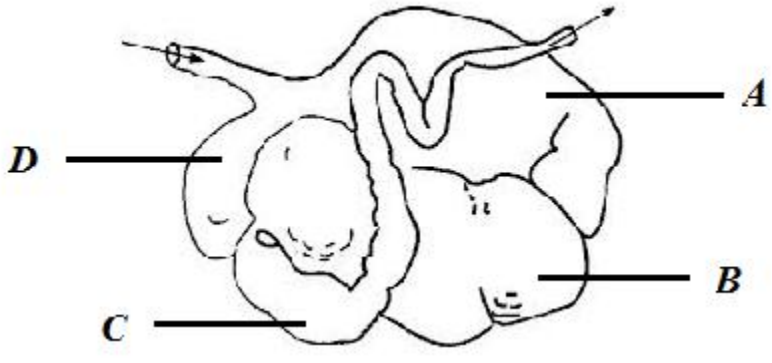


Diagram 9
Rajah 9

Which of the label part **A**, **B**, **C** or **D**, is the true stomach of cow?
Antara bahagian **A**, **B**, **C** *atau* **D**, *yang manakah adalah perut sebenar lembu?*

15 The following statements are about mineral X in plant.
Maklumat berikut adalah mengenai nutrien X *terhadap tumbuhan.*

- Formation of leaves, synthesis of auxin and cofactor in carbohydrate metabolism.
  Pembentukan daun, sintesis auxin dan kofaktor dalam metabolism karbohidrat.
- Spotted leaves with irregular area of chlorosis and retarded growth.
  Permukaan daun berbintik dengan bahagian berklorosis, pertumbuhan terbantut

What is mineral X?
Apakah mineral X*?*

A Molybdenum
Molibdenum

B Zinc
Zink

C Magnesium
Magnesium

D Mangan
Mangan

16 Diagram 10 shows the structure of a chloroplast.
Rajah 10 *menunjukkan struktur kloroplas.*

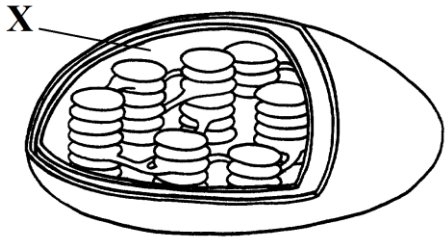


Diagram 10
Rajah 10

Which of the following statements is **true** about reaction that occurs in X?
*Antara pernyataan berikut, yang manakah **benar** mengenai tindakbalas yang berlaku dalam X?*

A Hydrogen atom reduces carbon dioxide into glucose.
Atom hidrogen menurunkan karbon dioksida kepada glukosa.

B Substance required in the reaction is water.
Bahan yang diperlukan dalam tindakbalas tersebut ialah air.

C Sunlight is captured, causing the electrons of chlorophyll to get excited.
Cahaya diserap, dan menyebabkan electron-elektron klorofil teruja.

D Light energy is used to split the water molecules
Tenaga cahaya digunakan untuk memisahkan molekul air.

17 Table 2 shows the nutrient content for every 100g of certain food.
Jadual 2 *menunjukkan kandungan nutrient bagi setiap* 100g *makanan tertentu.*

Food ***Makanan***	**Protein(g)** ***Protein(g)***	**Carbohydrate(g)** ***Karbohidrat(g)***	**Calcium(mg)** ***Kalsium(mg)***	**Vitamin A (ug)**	**Vitamin D (mg)**
A	12.3	4.2	4	155	0
B	17.4	0	16	0	0
C	3.3	4.8	120	44	6
D	0.7	5.4	48	200	1

Table 2
Jadual 2

Which food **A**, **B**, **C** or **D** in the Table 2 is most suitable for those suffering from osteoporosis?
Antara makanan **A**, **B**, **C** *atau* **D** *dalam Jadual* 2 *yang manakah paling sesuai untuk penghidap osteoporosis?*

18 A patient is told by doctor that organ X as shown in Diagram 11 fails to function.
Seorang pesakit diberitahu oleh doktor bahawa organ X *seperti yang ditunjukkan dalam Rajah* 11 *gagal berfungsi*.

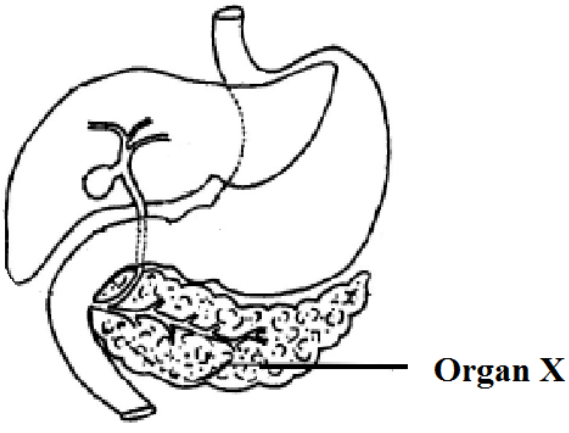


Diagram 11
Rajah 11

Base on the information, which are most likely to happen if that patient does not receive proper treatment?
Berdasarkan maklumat tersebut, yang manakah akan berlaku jika pesakit tersebut tidak menerima rawatan yang betul?

I Digestion of protein will be affected
Penghadaman protein akan terganggu

II Digestion of uncooked starch is not completed
Penghadaman kanji mentah tidak lengkap

III Hyperglycemia will occur
Hyperglisemia akan berlaku

IV No neutral medium in duodenum
Tiada medium neutral dalam duodenum

A 1 and 11 only
I *dan* II *sahaja*

B II and III only
II *dan* III *sahaja*

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

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

19 Which of the following happens during inhalation?
Antara yang berikut yang manakah berlaku semasa menarik nafas?

A The external intercostal muscles relax
Otot interkosta luar mengendur

B The diaphragm muscles contract
Otot diafragma mengecut

C The rib cage moves downwards and inwards.
Sangkar rusuk turun ke bawah dan ke dalam

D The diaphragm curves and become dome-shaped.
Otot diafragma berbentuk kubah

20 Diagram 11 shows part of a tracheal system in an insect.
Rajah 11 *menunjukkan sebahagian daripada sistem trakea dalam serangga.*

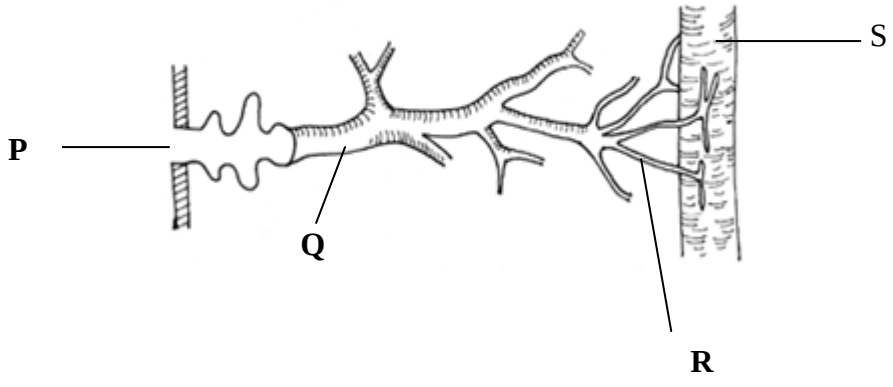


Diagram 11
Rajah 11

Gaseous exchange in insects occurs between
Pertukaran gas dalam serangga berlaku diantara.

A Q and S
Q *dan* S

B P and R
P *dan* R

C R and S
R *dan* S

D R and Q
R *dan* Q

21 Diagram 12 shows part of human respiratory system.
Rajah 12 *menunjukkan bahagian dalam sistem respirasi manusia.*

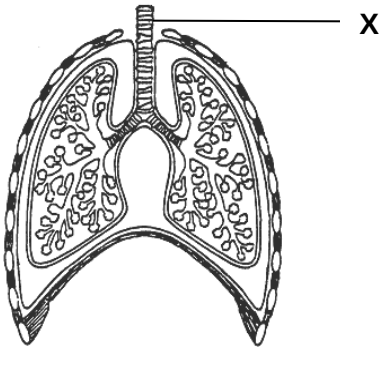


Diagram 12
Rajah 12

Which tissue supports the structure X?
Apakah tisu yang menyokong struktur X*?*

A Bone
Tulang

B Chitin
Kitin

C Cartilage
Rawan

D Muscle
Otot

22 Diagram 13 shows how an air sample is taken from a student who just finished running 100m.
Rajah 13 *menunjukkan bagaimana sampel udara diambil daripada pelajar yang baru sahaja tamat larian* 100m.

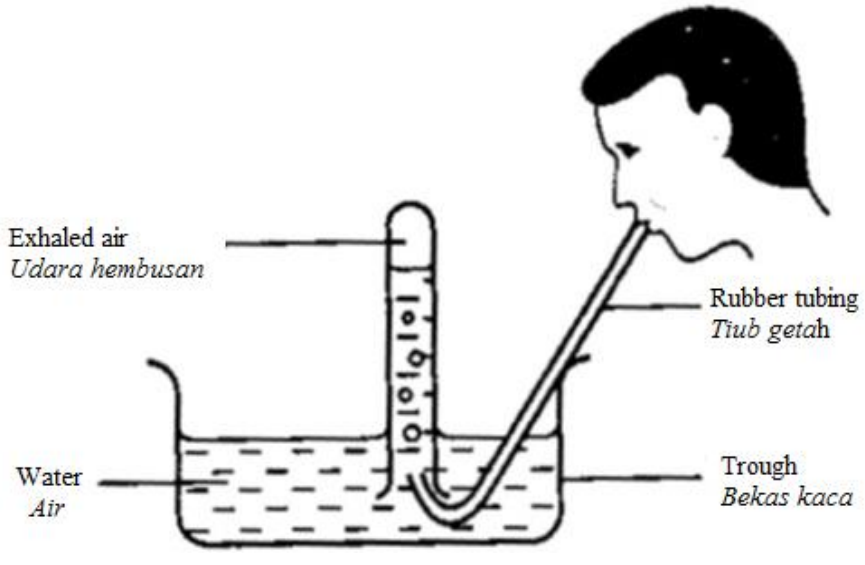


Diagram 13
Rajah 13

It is found out that the concentration of carbon dioxide after exercise is higher.
Which of the following causes the increase in carbon dioxide?
Didapati komposisi karbon dioksida udara hembusan pelajar ini adalah lebih tinggi.
Diantara berikut yang manakah menyebabkan peningkatan karbon dioksida?

A Due to increase in ventilation
Kerana peningkatan ventilasi

B Conversion of lactic acid
Penukaran asid laktik

C More glucose breakdown to release more energy
Lebih penguraian glukosa untuk membebaskan lebih tenaga

D Tiredness cause the cell to become more active at releasing carbon dioxide
Kepenatan menyebabkan lebih banyak karbon dioksida dihasilkan oleh sel

23 *Durio zibenthinus* is the scientific name of durian tree. The word *zibenthinus* refers to ..
Durio zibenthinus adalah nama saintifik bagi pokok durian. Perkataan zibenthinus merujuk kepada ..

A Genus
Genus

B Species
Spesies

C Class
Kelas

D Order
Order

24 Diagram 14 shows two organisms living together.
Rajah 14 *menunjukkan dua organisma yang hidup bersama..*

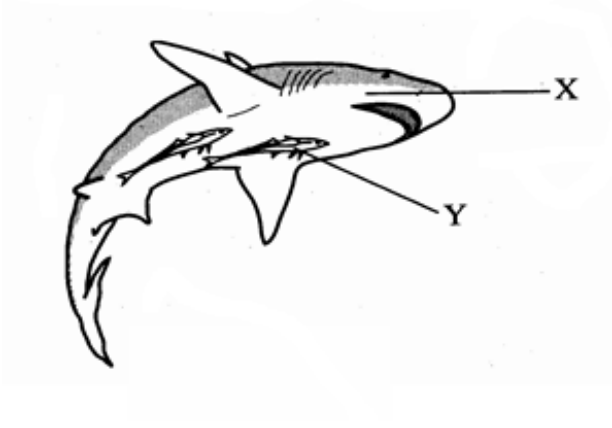


Diagram 14
Rajah 14

Which of the following describe the relationship between a remora fish (Y) and a shark (X)?
Manakah antara berikut menerangkan perhubungan antara ikan remora (Y) *dan jerung* (X)*?*

	Shark (X)	**Remora fish (Y)**
A	Provide food *Membekalkan makanan*	Absorb digested nutrient *Menyerap makanan tercerna*
B	Live temporarily outside the host *Tinggal sementara di luar hos*	Provide temporary place to live *Menyediakan tempat sementara untuk hidup*
C	Provide transport and safety *Menyediakan pengangkutan dan keselamatan*	Get free transport, occasionally food *Dapat pengangkutan percuma, sesekali makanan*
D	Ectoparasite *Ektoparasit*	Host *Perumah*

25 Diagram 15 shows a mangrove swamp at the river mouth in the year 2007.
Rajah 15 *menunjukkan paya bakau di sebuah muara sungai pada tahun 2007.*

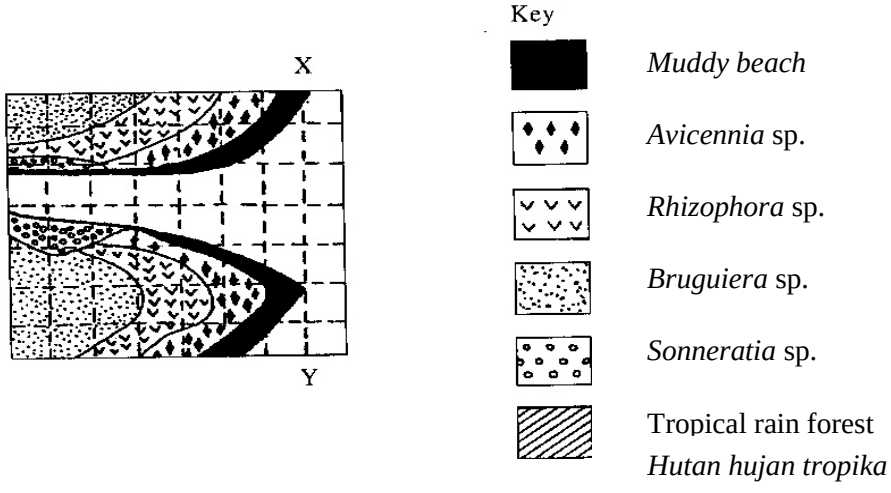
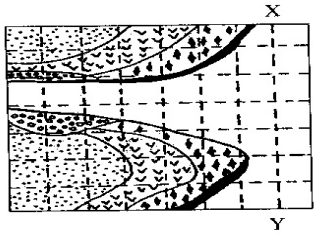


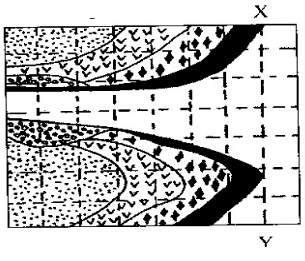
Diagram15
Rajah 15

Predict which is the possible zonal shift at the river mouth in the year 2050 if the area is used for fisheries?
Ramalkan yang manakah mungkin mewakili perubahan zon yang berlaku di muara sungai pada tahun 2050 *jika kawasan itu digunakan untuk penternakan ikan?*

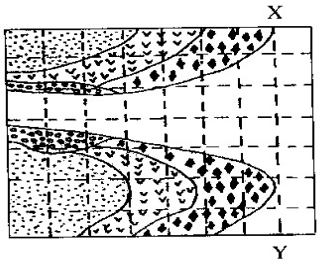
A



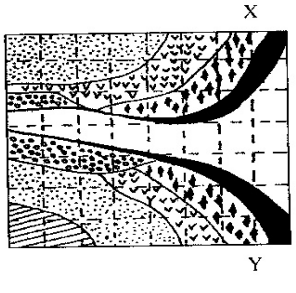
B



C



D



26 Table 3 shows the result of a field study to estimate the population of garden snails in a vegetable farm.
Jadual 3 *menunjukkan keputusan kajian lapangan untuk menganggar saiz populasi siput babi di dalam sebuah ladang sayur.*

Sample	Number of garden snails captured *Bilangan siput babi yang ditangkap*	
First *Pertama*	280	
Second *Kedua*	70 marked 70 *bertanda*	80 unmarked 80 *tidak bertanda*

Table 3
Jadual 3

What is the estimated population size of the snail ?
Berapakah anggaran saiz populasi siput babi berkenaan?

A 6 **B** 225

C 37 **D** 600

27 Diagram 16 shows the emission of various gases by a chemical factory in an industrial area.
Rajah 16 *menunjukkan pengeluaran pelbagai jenis gas dari sebuah kilang kimia di kawasan perindustrian.*

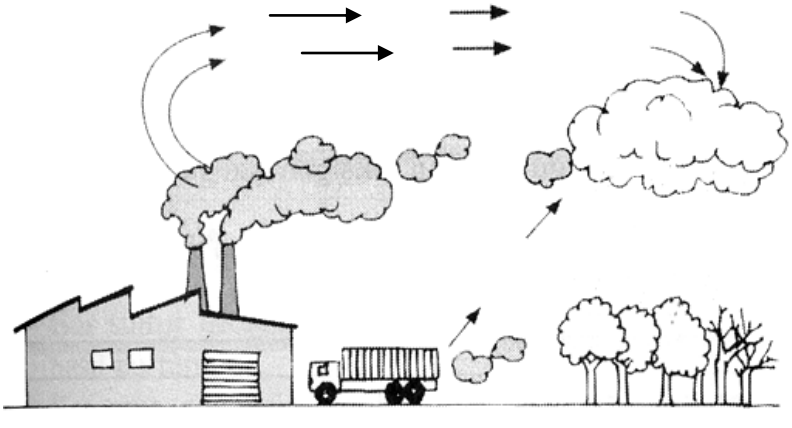


Diagram 16
Rajah 16

Which of the following is most likely to occur?
Antara berikut yang manakah paling mungkin untuk berlaku?

A Acid rain
Hujan asid

B The greenhouse effect
Kesan rumah hijau

C Global warming
Pemanasan global

D The thinning of ozone layer
Penipisan lapisan ozon

28 Nitrates and phosphates from farmland that flow into a lake caused rapid growth of algae. What is the phenomenon described by the above situation?
Nitrat dan fosfat yang dialirkan dari ladang ke dalam tasik telah menyebabkan pertumbuhan alga yang mendadak.
Apakah fenomena yang diterangkan oleh situasi di atas?

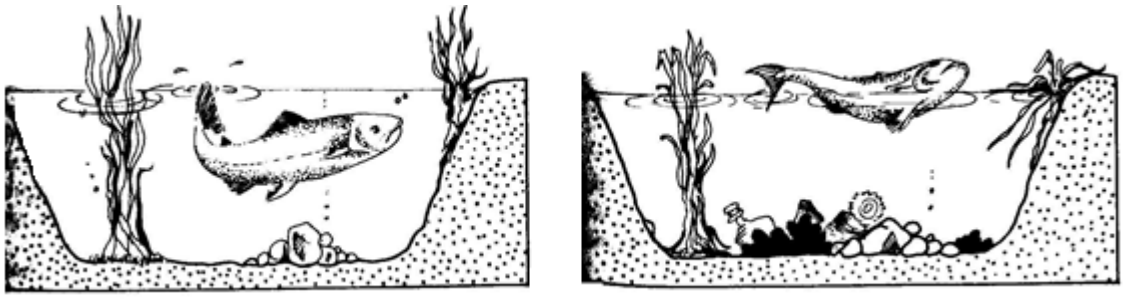
A Eutrophication
Eutrofikasi

B Fertilizer accumulation
Pengumpulan baja

C Pesticide pollution
Pencemaran pestisid

D Colonisation
Pengkolonian

29 Diagram 17 shows a situation of a pond in year 1999 and 2003.
Rajah 17 *menunjukkan keadaan sebuah kolam pada tahun* 1999 *dan* 2003.



Year 1999
Tahun 1999

Year 2003
Tahun 2003

Diagram 17
Rajah 17

Which of the following statements **best** explain the diagram above?
*Antara pernyataan berikut yang manakah **sesuai** menerangkan kejadian dalam rajah di atas*

I Domestic waste is a main factor in pond pollution
Sisa domestik adalah faktor utama pencemaran kolam

II Additional quantity of nitrogenous material increases the number of microorganisms
Penambahan kuantiti bahan bernitrogen meningkatkan bilangan mikroorganisma

III BOD will increase because the content of oxygen decrease
BOD akan meningkat kerana kandungan oksigen berkurang

IV Aquatic organism died due to lack of oxygen
Organisma akuatik mati disebabkan kekurangan oksigen

A II and IV
II *dan* IV

B II and III
II *dan* III

C I, III and IV
I, III *dan* IV

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

30 Table 4 shows the result of an experiment to compare the water quality in areas R and S.
Jadual 4 *menunjukkan keputusan satu eksperimen membandingkan kualiti air di kawasan* R *dan* S.

Water sample ***Sampel air***	**Time taken for methylene blue to be decolourised/ minutes** ***Masa diambil untuk larutan metilena biru dilunturkan/minit***
Area R *Kawasan R*	45
Area S *Kawasan S*	22

Table 4
Jadual 4

Which of the following statement is **true** to explain the result of the experiment?
Antara pernyataan berikut yang manakah ***benar*** *menerangkan keputusan eksperimen di atas?*

I Water sample from area R is more polluted than area S
Sampel air dari sumber R *lebih tercemar berbanding sumber* S

II Water sample from area R has lower BOD value than area S
Sampel air dari sumber R *mempunyai nilai* BOD *yang lebih rendah berbanding sumber* S

III Water sample from area R has less microorganisms than area S
Sampel air dari sumber R *mengandungi kurang mikroorganisma berbanding sumber* S

IV Water sample with higher BOD value causes slow decolouration
Sampel air yang mempunyai nilai BOD *yang tinggi melunturkan larutan metilena biru lebih perlahan*

A I and III
I *dan* III

B II and III
II *dan* III

C II and IV
II *dan* IV

D III and IV
III *dan* IV

31 The following statements describe the process that occurs in the body defence mechanism.
Pernyataan *berikut menerangkan tentang proses yang berlaku di dalam sistem pertahanan badan.*

- The level of antibody rises slowly over a period of few weeks when attacked by pathogens.
  Paras antibody meningkat secara perlahan dalam beberapa minggu selepas diserang oleh patogen.
- The antibody is very specific and last as long as the lymphocytes producing it survive
  Antibodi sangat khusus dan bertahan lama selagi limfosit yang menghasilkannya kekal

What type of immune response is obtained?
Apakah jenis imuniti yang diperolehi ?

A Naturally acquired active immunity
Keimunan aktif semulajadi

B Naturally acquired passive immunity
Keimunan pasif semulajadi

C Artificial active immunity
Keimunan aktif buatan

D Artificial passive immunity
Keimunan pasif buatan

32 Diagrams 18 shows the structure of human heart.
Rajah 18 menunjukkan struktur jantung manusia.

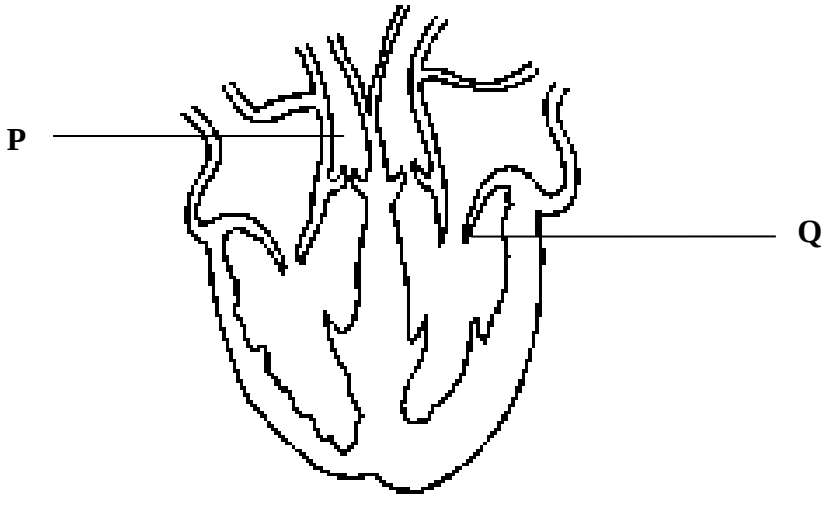


Diagram 18
Rajah 18

What are the structures labelled P and Q?
Apakah struktur yang berlabel P *dan* Q*?*

A P is pulmonary artery and Q is the bicuspid valve.
P *ialah arteri pulmonary dan* Q *ialah injap bikuspid*

B P is pulmonary vein and Q is bicuspid valve.
P *ialah vena pulmonary dan* Q *ialah injap bikuspid*

C P is pulmonary artery and Q is tricuspid valve
P *ialah arteri pulmonari dan* Q *ialah injap trikuspid*

D P is pulmonary vein and Q is semi-lunar valve
P *ialah vena pulmonari dan* Q *ialah injap sabit*

33 Diagram 19 shows the internal environment in multicellular organism
Rajah 19 *menunjukkan persekitaran dalaman dalam organisma mlktisel.*

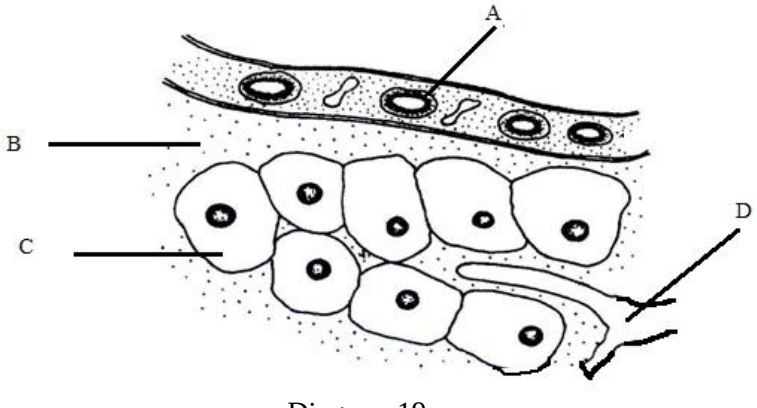


Diagram 19
Rajah 19

Which part labeled **A** ,**B**, **C** and **D** contain higher concentration of fatty acid and glycerol?
Bahagian manakah yang berlabel **A** , **B** ,**C** *dan* **D** *mengandungi kepekatan asid lemak dan gliserol yang tinggi ?*

34 Diagram 20 shows cross section of vascular bundle of a plant
Rajah 20 *menunjukkan keratan rentas berkas vascular suatu tumbuhan*

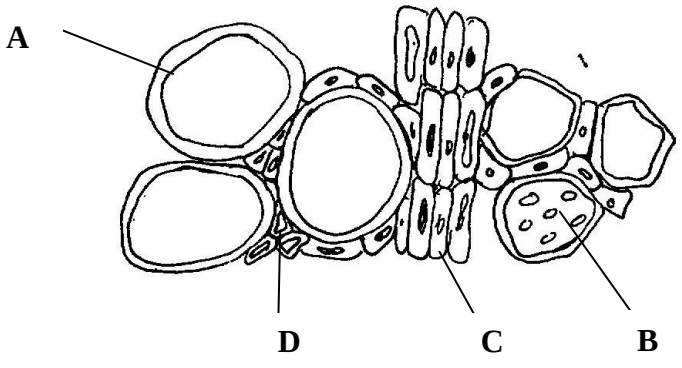


Diagram 20
Rajah 20

The plant is exposed to radioactive carbon dioxide and light for a few hours.
Which tissue labelled **A**, **B**, **C** and **D** is the first to have a trace of radioactive carbon?

Tumbuhan didedahkan kepada radioaktif karbon dan cahaya selama beberapa jam
Antara tisu berlabel **A** , **B** , **C** *dan* **D** , *yang manakah paling awal dikesan mengandungi karbon radioaktif*

35

- Circular muscle contract and the body lengthen
  Otot keliling menguncup dan badan memanjang
- The longitudinal muscle stretches and pushes the body compartment forwards.
  Otot bujur memanjang dan menolak segmen badan ke hadapan

Which animal shows the kind of movement describe above ?
Haiwan apakah yang menunjukkan pergerakan di atas ?

A Snake
Ular

B Worms
cacing

C Insect
Serangga

D Lizard
cicak

36 Diagram 21 shows two of the vertebra bones in the spinal cord.
Rajah 21 *menunjukkan dua daripada ruas vertebra di sepanjang tulang belakang*

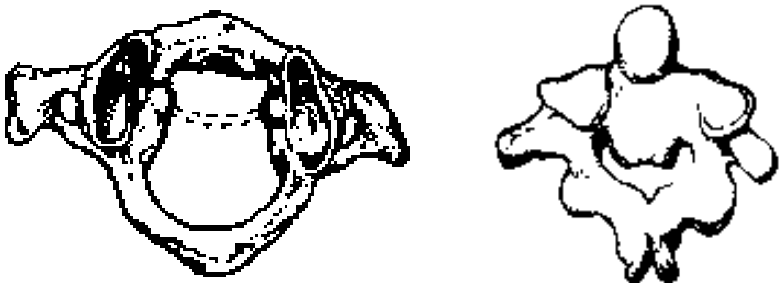


Diagram 21
Rajah 21

What type of movement is allowed between the joint of these two bones ?
Apakah bentuk pergerakan yang dibenarkan oleh persendian di antara dua ruas vertebra di atas?

A Movement of head from side to side
Menggeleng

B Nodding
Mengangguk

C Bending
Membongkok

D Rotating 180 ^{o}
Putaran 180 ^{o}

37 Diagram 22 shows water exudes from the special pores at the edge of leaves.
Rajah 22 *menunjukkan pengeluaran titisan air melalui rongga khas di hujung daun*

Diagram 22
Rajah 22

What is the process in which water exudes from the special pores at the edges of leaves ?
Apakah proses pengeluaran titisan air melalui rongga khas di hujung daun ?

A Guttation
Gutasi

B Translocation
Translokasi

C Transpiration
Transpirasi

D Root pressure
Tekanan akar

38 Diagram 23 is a structure protected by the spinal column
Rajah 23 *ialah suatu struktur yang dilindungi oleh turus vertebra*.

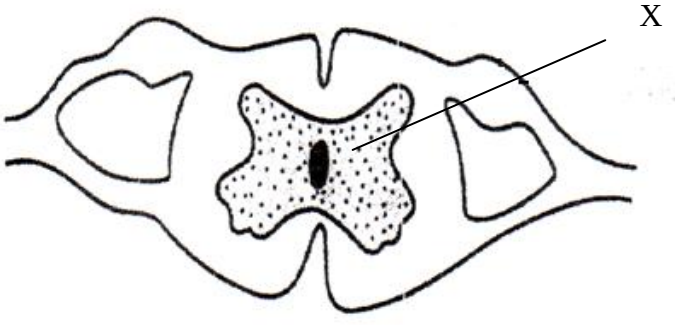


Diagram 23
Rajah 23

What is the main component of structure X?
Apakah komponen utama struktur X?

A Cerebrospinal fluid
Cecair spinal

B Cell bodies and synapses
Badan sel dan sinaps

C Myelinated nerve fibres
Saraf bermielin

D Red blood cells
Sel darah merah

39 Diagram 24 shows direction of light on coleoptile .
Rajah 24 *menunjukkan arah pendedahan cahaya ke atas satu koleoptil.*

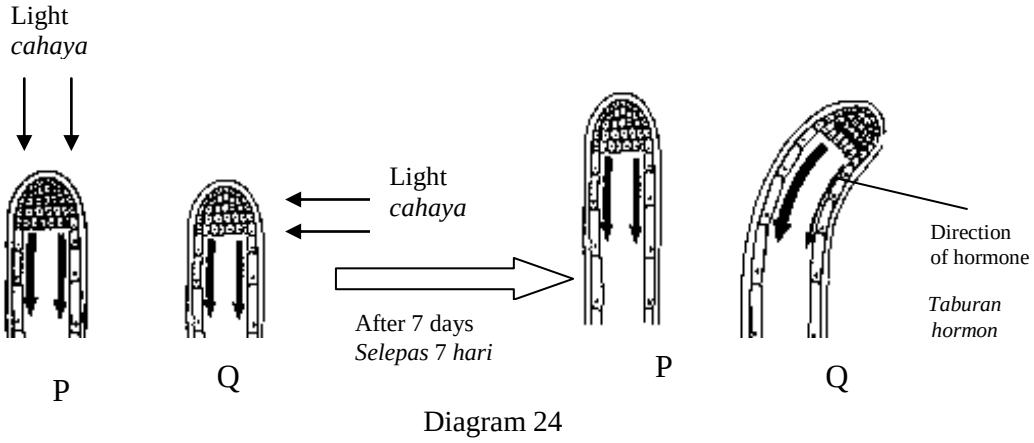


Diagram 24
Rajah 24

What conclusion is derived from the experiment based on the diagram shown ?
Apakah kesimpulan yang boleh dibuat daripada eksperimen seperti yang ditunjukkan?

A Light stimulates the elongation of coleoptiles
Cahaya merangsang pemanjangan koleoptil

B Elongation of cells are longer at the side further away from light
Pemanjangan sel berlaku lebih banyak di bahagian yang terlindung daripada cahaya

C The hormone ethylene distributed downwards
Taburan hormon etilena adalah ke arah bawah

D Growth of coleoptile is not influenced by distribution of hormone
Pertumbuhan koleoptil tidak dipengaruhi oleh taburan hormon

40 Which structure and function of a nerve cell is paired **correctly**?
*Pasangan antara struktur dan fungsi sel saraf yang manakah dipadankan dengan **betul**?*

	Structure **Struktur**	**Function** **Fungsi**
A	Myelin sheath *Sarung mielin*	Transmit impulse *Menghantar impuls*
B	Cell body *Badan sel*	Contain mucleus and cytoplasm *Mengandungi nukleus dan sitoplasma*
C	Dendrites *Dendrit*	Initiate Impulse *Mencetus impuls*
D	Node of Ranvier *Nodus Ranvier*	Control cell activity *Mengawal aktiviti sel*

41

A hyperactive child has part of his thyroid removed.

Sebahagian daripada kelenjar tiroid kanak-kanak yang hiperaktif telah dibuang

What is the reason for such an action?
Apakah tujuan tindakan tersebut?

A Reduce the production of thyroxin
Mengurangkan penghasilan tiroksina

B Slow down the child movement
Memperlahankan pergerakan kanak-kanak

C Increase the ability of child to control his movement
Meningkatkan keupayaan mengawal pergerakan

D Improve coordination and response
Meningkatkan koordinasi dan tindakbalas

42 Which cell has a diploid number of chromosomes?
Sel yang manakah mempunyai bilangan kromosom diploid?

A Secondary oocyte
Oosit sekunder

B Spermatid
Spermatid

C Spermatogonium
Spermatogonium

D Polar body
Jasad kutub

43 Which pair of hormones are released by ovary in the menstrual cycle ?
Antara yang berikut, yang manakah merupakan hormone yang terlibat dalam kitaran haid?

A Luteinizing hormone and FSH
Hormon Pluteinan dan FSH

B Progesterone and Oestrogen
Progesteron dan Estrogen

C Luteinizing and Oestrogen
Hormone Pluteinan dan Estrogen

D Androgen dan Progesteron
Androgen dan Progestron

44 The informations below are problem faced by a couple
Pernyataan di bawah adalah mengenai sistem pembiakan.

- Damage of the Fallopian tubes
  Kerosakan di tiub Fallopio
- Low sperm count
  Bilangan sperma yang sedikit

Which method is best applied if the couple want a child of their own?
Kaedah yang mana sesuai digunakan jika pasangan tersebut ingin memperoleh anak sendiri?

A In vitro fertilisation
Persenyawaan in vitro

B Gene therapy
Terapi gen

C Replace Fallopian Tube
Ganti tiub Falopio

D Take Viagra pill
Ambil pil Viagra

45 Diagram 25 shows a mature ovule of a flowering plant.
Rajah 25 *menunjukkan satu ovul pada tumbuhan berbunga.*

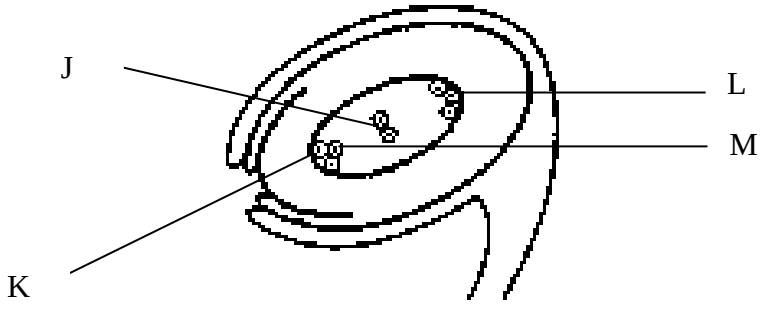


Diagram 25
Rajah 25

J,K,L and M are the nuclei found in the ovule.
Which nuclei fuse with male gametes during double fertilisation?
J,K,L *dan* M *adalah nukleus yang terdapat didalam ovul.*
Nukleus-nukleus yang manakah bercantum dengan gamet-gamet jantan semasa persenyawaan ganda dua?

A J and K
J *dan* K

B K and L
K *dan* L

C L and M
L *dan* M

D J and M
J *dan* M

.

46 The following statement is related to inheritance.
Pernyataan berikut berkaitan dengan pewarisan.

- The way in which the constituent of gene is expressed physically
  Kandungan gen itu ditunjukkan secara fizikal
- The appearance is determined by either pairs of allele alone or as well as environmental factor
  Sifat yang dilihat ditentukan oleh sama ada pasangan alel sahaja atau melibatkan juga faktor persekitaran

What is the **correct** term for this description?
*Apakah istilah yang **betul** bagi pernyataan ini?*

A Genotype
Genotip

B Phenotype
Fenotip

C Characteristic
Ciri

D Trait
Sifat

47 The allele for curly hair in humans is dominant over straight hair. A woman with curly hair is heterozygous while her husband has straight hair.
What is the probability of getting a child with curly hair?

Alel bagi rambut kerinting pada manusia dalah dominan terhadap rambut lurus. Seorang perempuan yang berambut kerinting adalah heterozigot manakala suaminya mempunyai rambut lurus.
Apakah kebarangkalian untuk mendapat anak yang berambut kerinting?

A 100%

B 75%

C 50%

D 25%

48 In a disputed paternity case, the following blood groups were identified.
Dalam satu kes perbicaraan paterniti kumpulan darah yang berikut dikenalpasti.

Mother *Ibu*	Blood group AB *Kumpulan darah* AB
Baby *Bayi*	Blood group A *Kumpulan darah* A
Steven	Blood group O *Kumpulan darah* O
John	Blood group AB *Kumpulan darah* AB

Which combination of the following statements is **correct**?
*Pernyataan yang manakah yang **betul**?*

I The genotype of the baby is I^AI^O
Genotip bayi ialah I^AI^O

II The genotype of the mother is I^AI^B
Genotip ibu ialah I^AI^B

III Steven is the father of the baby
Steven ialah bapa kepada bayi

IV Neither Steven or John could be the father to the baby
Steven dan John bukan bapa kepada bayi

A I,II and IV
I,II *dan* IV

B I and II
I *dan* II

C I,III and IV
I,III *and* IV

D I,II and III
I,II *dan* III

49 Diagram 26 shows a schematic diagram of a genetic disease.
Rajah 26 *menunjukkan rajah skema perwarisan suatu jenis penyakit genetik*

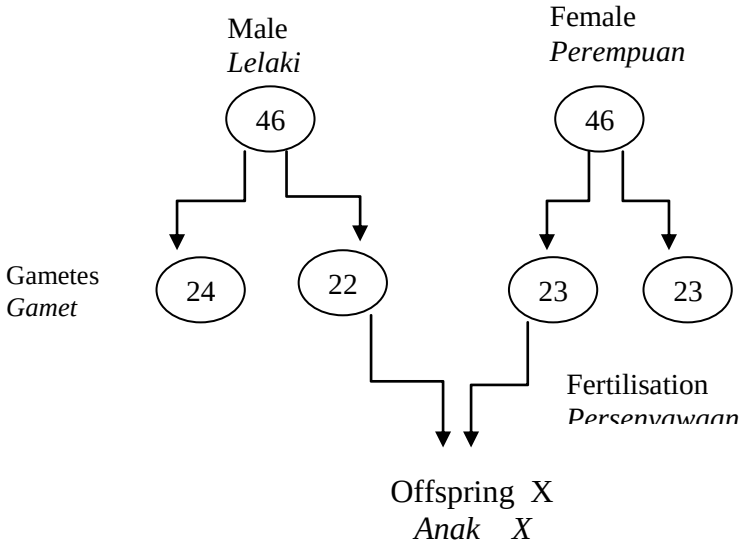


Diagram 26
Rajah 26

What is the genetic disease suffered by offspring X ?
Apakah penyakit genetik yang dialami oleh anak X ?

A Turner Syndrome
Sindrom Turner

B Down's Syndrome
Sindrom Down

C Klinefelter Syndrome
Sindrom Klinefelter

D Sickle-cell anaemia
Anemia sel sabit

50 Mutagen is a physical or chemical agent that change the genetic material.
Which of the following are mutagen ?
Mutagen adalah agen fizikal dan kimia yang mengubah bahan genetik.
Antara yang berikut yang manakah merupakan mutagen ?

I Sodium chloride
Natrium klorida

II Nitrogen
Nitrogen

III Gamma rays
Sinar gama

IV Formaldehid
Formaldehid

A I and II
I *dan* II

B I and III
I *dan* III

C II and IV
II *dan* IV

D III and IV
III *dan* IV

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

Biology
Kertas 2
Ogos 2014
2 ½ Jam

KEMENTERIAN PENDIDIKAN MALAYSIA

http://cikguadura.wordpress.com/

BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH DAN SEKOLAH KECEMERLANGAN

PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2014
PERCUBAAN SIJIL PELAJARAN MALAYSIA

BIOLOGI
Kertas 2
2 jam 30 minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini adalah dalam **dwibahasa**.
2. Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.
3. Kertas soalan ini mengandungi **dua bahagian**.
4. Jawab **semua** soalan dalam Bahagian A. Tuliskan jawapan anda di dalam ruangan yang disediakan pada kertas soalan.
5. Jawab **mana-mana dua** soalan dalam Bahagian B. Tuliskan jawapan anda pada kertas bergaris dengan terperinci.
6. Rajah yang diberikan dalam soalan tidak dilukiskan mengikut skala melainkan diberitahu.
7. Markah yang diperuntukkan ditunjukkan di dalam kurungan.
8. Cadangan tempoh melengkapkan Bahagian A ialah 90 minit, dan Bahagian B ialah 60 minit.
9. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

Untuk Kegunaan Pemeriksa			
Bahagian	**Soalan**	**Markah Penuh**	**Markah diperolehi**
A	1	12	
	2	12	
	3	12	
	4	12	
	5	12	
B	6	20	
	7	20	
	8	20	
	9	20	
Jumlah		**100**	

Kertas ini mengandungi 20 halaman bercetak

For Examiner's Use

Section A
Bahagian A

[60 marks]
[60 *markah*]

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

1 Diagram 1.1 shows the formation and breakdown of sucrose molecule.
Rajah 1.1 *menunjukkan pembentukan dan pemecahan molekul sukrosa.*

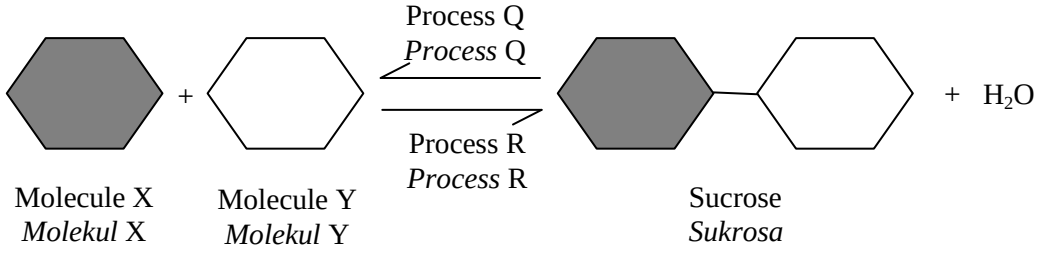


Diagram 1.1
Rajah 1.1

(a) Name molecules X and Y.
Namakan molekul X *dan* Y.

X ……..……...
Y ……..……...

[2 marks]
[2 *markah*]

(b) (i) Name processes Q and R
Namakan proses Q *dan R*

Q ……...
R ……

[2 marks]
[2 *markah*]

(ii) Process Q involves in the digestion of sucrose.
Support this statement by describing the chemical reaction that takes place.
Proses Q *terlibat dalam pencernaan sukrosa.*
Sokong pernyataan ini dengan menghuraikan tindak balas kimia yang berlaku.

……
……..……..……
……

[2 marks]
[2 *markah*]

For Examiner's Use

(c) Diagram 1.2 shows the action of an enzyme.
Rajah 1.2 *menunjukkan tindakan suatu enzim.*

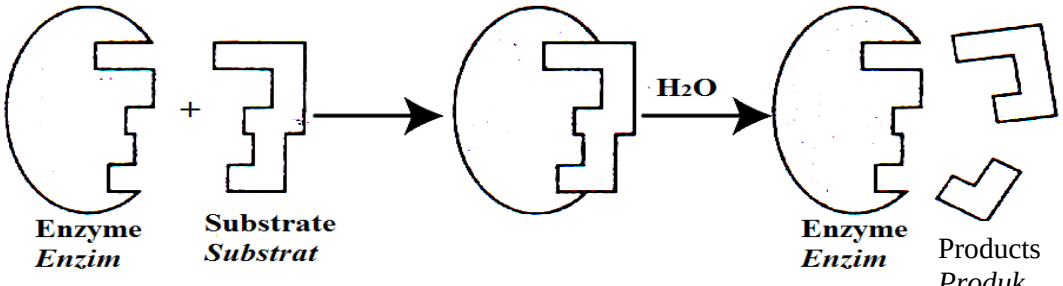


Diagram 1.2
Rajah 1.2

The action of enzyme and substrate is specific.
Give your opinion.
Tindakan antara enzim dan subsrat adalah spesifik.
Berikan pendapat anda.

……..

……..

……..

[2 marks]
[2 *markah*]

(d) (i) Name one enzyme that can be used to remove sucrose stain on cloth.
Namakan satu enzim yang boleh digunakan untuk menanggalkan kotoran sukrosa pada baju.

…… [1 mark]
[1 *markah*]

(ii) The effectiveness of the enzyme named in (d) (i) can be increased.
Suggest how.
Keberkesanan enzim yang dinamakan di (d) (i) *boleh ditingkatkan.*
Cadangkan bagaimana.

……

……

……

……

[3 marks]
[3 *markah*]

12

For Examiner's Use

2 Diagram 2.1 shows an earthworm and its muscles which involved in a forward movement.

Rajah 2.1 *menunjukkan seekor cacing tanah dan otot-otot yang terlibat dalam satu pergerakan ke hadapan.*

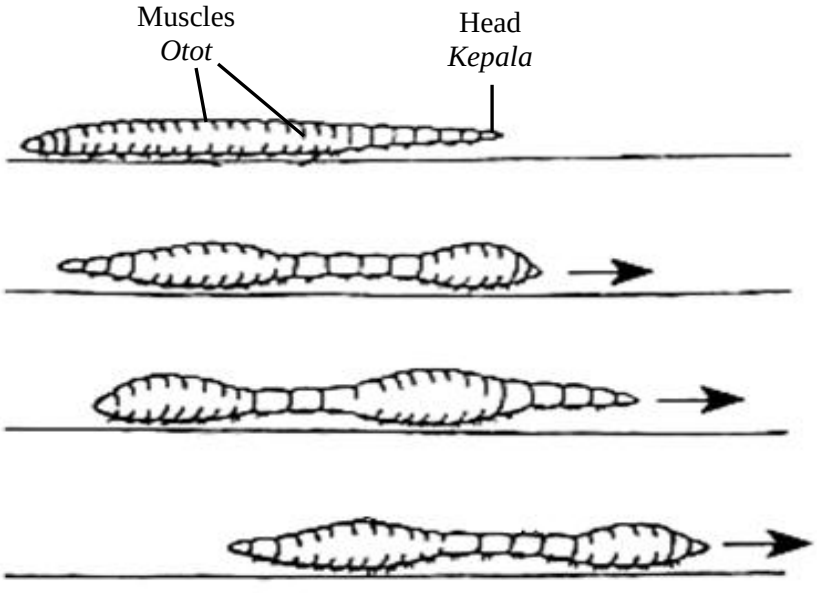


Diagram 2.1
Rajah 2.1

(a) Name the type of skeleton of an earthworm.

Namakan jenis rangka pada cacing tanah.

…….....

[1 mark]
[1 *markah*]

(b) The peristaltic waves that begin at the anterior (front part) and move towards the posterior (back part) of the body makes the earthworm move forward.

How the muscles in earthworm make this possible?

Gelombang peristalsis yang bermula dari bahagian hadapan dan bergerak ke bahagian belakang badan membolehkan cacing tanah bergerak ke hadapan.

Bagaimanakah otot-otot dalam cacing tanah membolehkan ini berlaku?

……..

……..

……..

[2 marks]
[2 *markah*]

For Examiner's Use

(c) Diagram 2.2 shows the cross section of the thorax of a bird.
Rajah 2.2 *menunjukkan keratan rentas toraks seekor burung.*

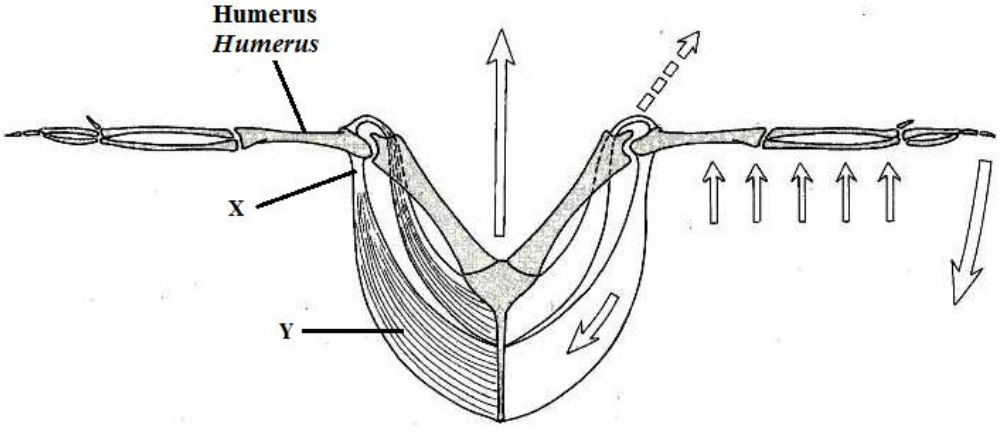


Diagram 2.1
Rajah 2.1

(i) Name tissue X.
Namakan tisu X.

…….. [1 mark]
[1 *markah*]

(ii) Suggest how tissue X plays its role in the bird's movement.
Cadangkan bagaimana tisu X *memainkan peranan dalam pergerakan burung itu.*.

……
……
……
[2 marks]
[2 *markah*]

(d) (i) Name the organelle found in abundance in tissue Y
Namakan organel yang banyak dijumpai dalam tisu Y.

…….....
[1 mark]
[1 *markah*]

(ii) Give supportive statement to your answer in (d) (i).
Berikan pernyataan yang menyokong jawapan anda di (d) (i).

……
……
……

[2 marks]
[2 *markah*]

For Examiner's Use

(e) Tissue Y is injured.
Does this affect the movement of the bird? Give your opinion.

Tisu Y *cedera.*
Adakah ini memberikan kesan kepada pergerakan burung itu?Berikan pendapat anda.

……..

……..

……..

……..

[3 marks]
[3 *markah*]

12

3 Diagram 3.1 shows red blood cells in a blood vessel.
Diagram 3.2 shows the condition of the red blood cells in solution P and solution Q.

Rajah 3.1 *menunjukkan sel darah merah di dalam satu salur darah.*
Rajah 3.2 *menunjukkan keadaan sel-sel darah merah itu di dalam larutan* P *dan larutan* Q.

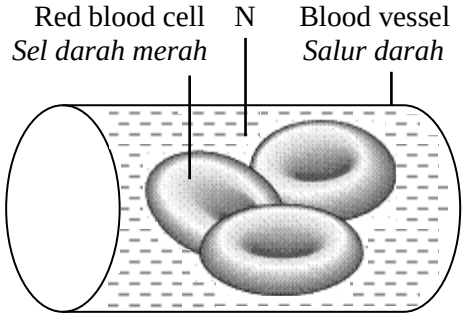
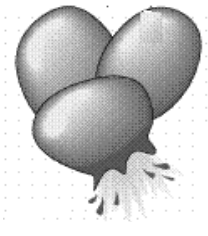
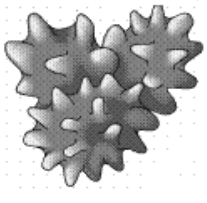


Diagram 3.1
Rajah 3.1



In solution P
Dalam larutan P



In solution Q
Dalam larutan Q

Diagram 3.2
Rajah 3.2

(a) Name the membrane that enclosed the red blood cell and fluid N.

Namakan membran yang membendungi sel darah merah dan cecair N.

Membrane
Membran ……..... [2 marks]
Fliud N ……..…… [2 *markah*]

(b) Fluid N is an isotonic solution to the red blood cells.
How is this important to the blood cells?

Cecair N *merupakan satu larutan isotonik kepada sel darah merah.*
Bagaimanakah keadaan ini penting kepada sel-sel itu?

……..

……..……

……..

[2 marks]
[2 *markah*]

For Examiner's Use

(c) Suggest how solution P and solution Q are different.
Cadangkan bagaimana larutan P *dan larutan* Q *adalah berbeza.*

……..
……..……
……..

[2 marks]
[2 *markah*]

(d) Diagram 3.3 shows the response of pituitary gland when the blood osmotic pressure increases.
Rajah 3.3 *menunjukkan gerak balas kelenjar pituitari apabila tekanan osmosis darah meningkat.*

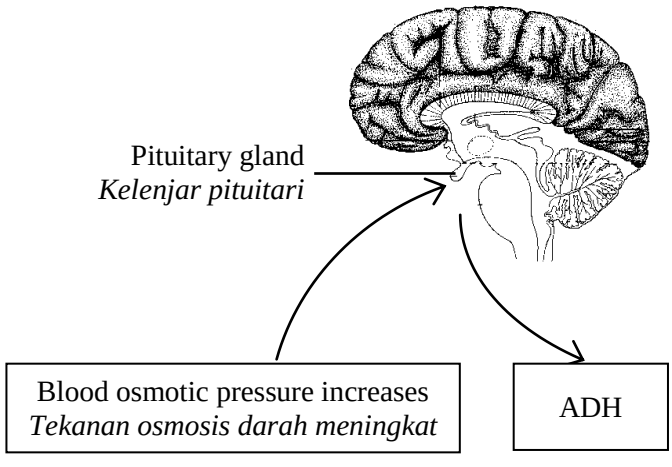


Diagram 3.3
Rajah 3.3

(i) What is meant by high osmotic pressure?
Apakah yang dimaksudkan dengan tekanan osmosis tinggi?

……
……..……..
……

[2 marks]
[2 *markah*]

(ii) Suggest how the antidiuretic hormone or ADH is able to regulate the blood osmotic pressure.
Cadangkan bagaimana hormon antidiuretik atau ADH *boleh mengawalatur tekanan osmosis darah.*

……
……..……..
……

[2 marks]
[2 *markah*]

For Examiner's Use

(iii) State the condition of the urine produced by a healthy person when his blood osmotic pressure of is high.

Nyatakan keadaan air kencing yang dihasilkan oleh seorang yang sihat apabila tekanan osmosis darahnya adalah tinggi.

……

……

[2 marks]
[2 *markah*]

12

4 Diagram 4 shows a cell cycle.

Rajah 4 *menunjukkan satu kitar sel.*

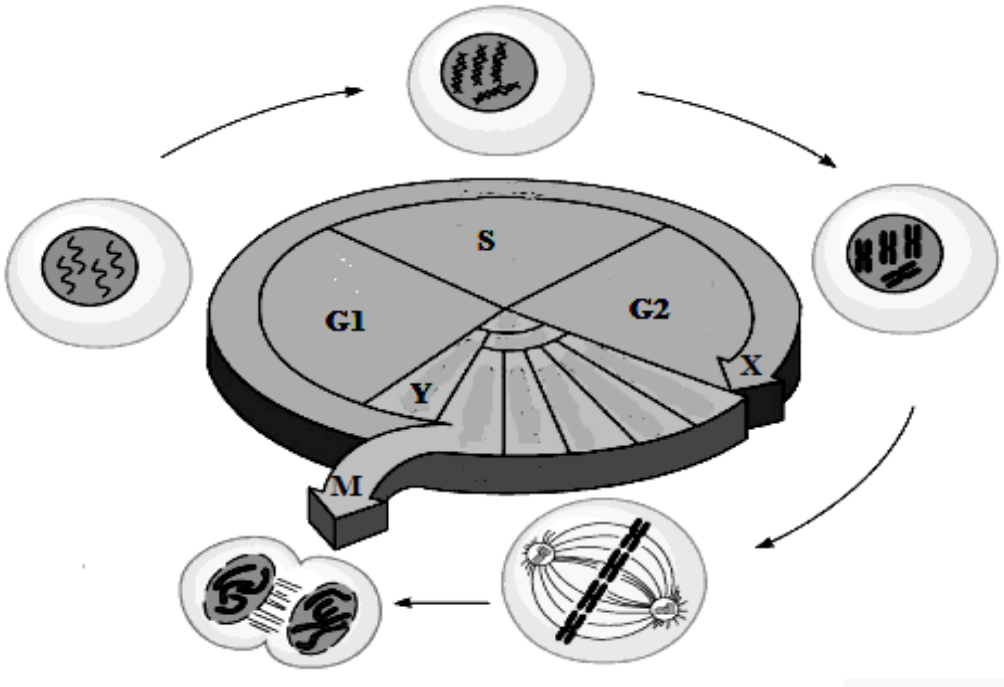


Diagram 4
Rajah 4

(a) Name phase X

Namakan fasa X

X……...……

[1 mark]
[1 *markah*]

(b) What happens during subphase S?

Apakah yang berlaku semasa subfasa S?

……

……

……

……

[3 marks]
[*3markah*]

For Examiner's Use

(c) M is mitosis.
Suggest how M will be affected if phase X does not occur.

M *ialah mitosis.*
Cadangkan bagaimana M *akan terkesan jika fasa* X *tidak berlaku.*

……..

……..

……..

……..

[3 marks]
[*3markah*]

(d) Phase M is important in making new cells.
Support this statement with more information.

Fasa M *adalah penting dalam penghasilan sel-sel baru.*
Sokong pernytaan ini dengan maklumat tambahan.

……..

……..

……..

[2 marks]
[2 *markah*]

(e) (i) Name process Y

Namakan proses Y

……

[1 mark]
[1 *markah*]

(ii) Process Y in plant cell is different from that occurs in animal cell.
Give your opinion.

Proses Y *dalam sel tumbuhan adalah berbeza daripada yang berlaku dalam sel haiwan.*
Berikan pendapat anda.

……

……

……

[2 marks]
[2 *markah*]

12

For Examiner's Use

5 Diagram 5.1 shows the formation of cells P.
Diagram 5.2 shows the pollination of cells P on the stigma of a matured pistil.

Rajah 5.1 *menunjukkan pembentukkan sel-sel* P.
Rajah 5.2 *menunjukkan pendebungaan sel-sel* P *di atas stigma satu pistil yang matang.*

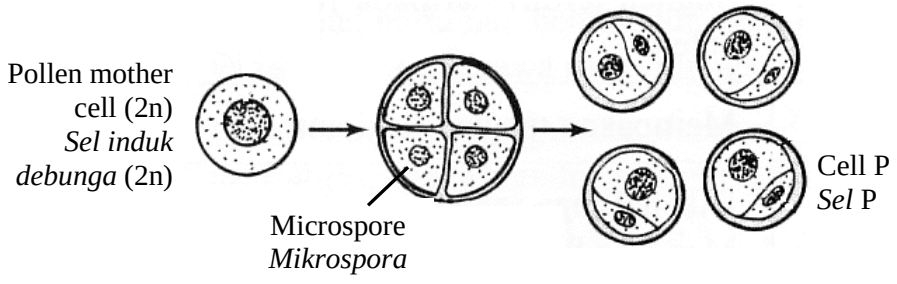


Diagram 5.1
Rajah 5.1

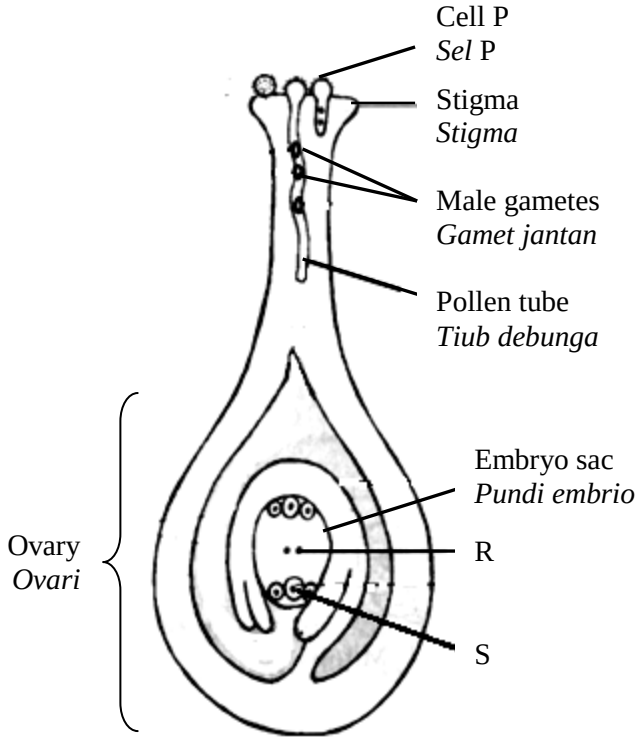


Diagram 5.2
Rajah 5.2

(a) Describe how cells P are formed from the pollen mother cell.
Huraikan bagaimana sel-sel P *terbentuk daripada sel induk debunga*.

……
……
……
[2 marks]

[2 *markah*]

For Examiner's Use

(b) Compare the number of nuclei in cell P and in the embryo sac.
What makes it different?

Bandingkan bilangan nukleus di dalam sel P *dan nukleus di dalam pundi embrio.*
Apakah yang menyebabkan perbezaan ini?

……

……

……

[2 marks]
[2 *markah*]

(c) (i) Cell P germinates in response to a sugary fluid secreted by the matured stigma forming a pollen tube. The pollen tube carries two male gametes towards the ovary. Inside the ovary, an embryo sac developed producing haploid nuclei. Three of the female nuclei are involved in double fertilisation.

Suggest what will happen to both nuclei R and nucleus S if the pollen tube fails to develop.

Sel P bercambah setelah dirangsang oleh cecair bergula yang dirembeskan oleh stigma matang membentuk satu tiub debunga. Tiub debunga ini membawa dua gamet jantan menghala ke ovari. Di dalam ovari, satu pundi embrio berkembang menghasilkan nukleus-nukleus haploid. Hanya tiga daripada nukleus-nukleus betina ini terlibat dalam persenyawaan gandadua.

Cadangkan apa yang akan berlaku kepada kedua-dua nukleus R *dan nukleus* S *jika tiub debunga gagal untuk berkembang.*

……

……

……

……

[3 marks]
[3 *markah*]

(ii) Double fertilisation in plants ensures the survival of plant species.
What is your opinion about this statement?

Persenyawaan gandadua dalam tumbuhan memastikan kemandirian spesies tumbuhan.
Apakah pendapat anda berkenaan pernyataan ini?

……

……

……

……

[2 marks]
[2 *markah*]

For Examiner's Use

(d) The ovary is able to develop into a fruit without undergoing fertilisation. It is the phenomenon of fruiting without the union of male and female gametes and artificially induced by applying hormone X on the stigma.

Ovari boleh berkembang menjadi buah tanpa melalui persenyawaan. Ini adalah satu fenomena pembuahan tanpa melibatkan paduan gamet betina dan gamet jantan dan dirangsang secara buatan dengan meyemburkan hormone X *ke atas stigma.*

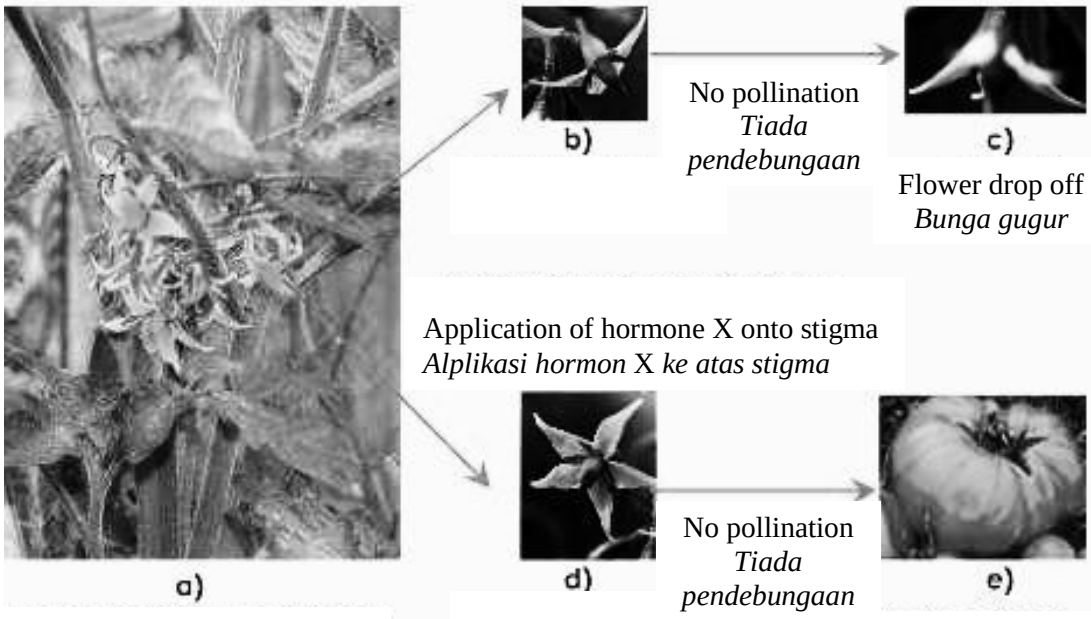


Diagram 5.3
Rajah 5.3

(i) Name the phenomenon in producing seedless fruits and give one example of hormone X.

Namakan fenomena dalam menghasilkan buah tanpa biji dan berikan satu contoh hormone X.

Phenomenon
Fenomena ……..……..

Hormone X
Hormon X ……..…….. [2 marks]
[2 *markah*]

(ii) Suggest one benefit of producing seedless fruits.

Cadangkan satu kebaikan menghasilkan buah tanpa biji.

……

……
[1 mark]
[1 *markah*]

12

Section B
***Bahagian* B**

[40 marks]
[40 *markah*]

Answer any **two** questions in this section.
Jawab mana-mana **dua** *soalan dalam bahagian ini.*

6 (a) Diagram 6.1 shows two types of mechanisms used by antibodies to destroy antigen.
Rajah 6.1 *menunjukkan dua jenis mekanisme yang digunakan oleh antibodi untuk memusnahkan antigen.*

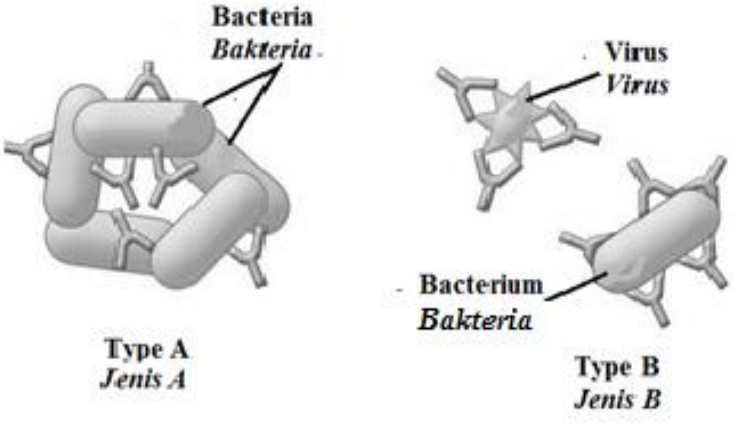


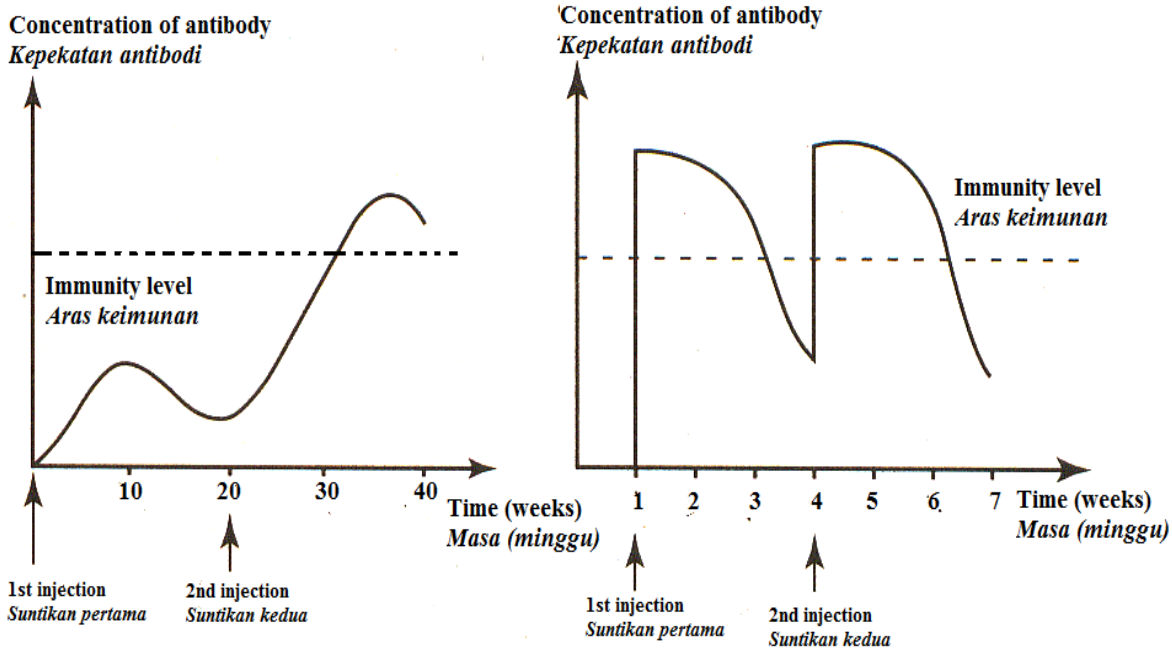
Diagram 6.1
Rajah 6.1

Suggest how the mechanisms Type A and Type B are able to destroy antigens.
Cadangkan bagaimana mekanisme antibodi Jenis A *dan Jenis* B *boleh memusnahkan antigen.*

[6 marks]
[6 *markah*]

(b) Diagram 6.2 shows the concentration of antibody in the blood of a person who acquired two different types of immunity.

Rajah 6.2 *menunjukkan kepekatan antibodi dalam darah seseorang yang memperoleh dua jenis keimunan.*



Situation X
Situasi X

Situation Y
Situasi Y

Diagram 6.2
Rajah 6.2

How the immunity achieved in situation X and situation Y are different?
Bagaimankah keimunan yang diperolehi dalam situasi X *dan situasi* Y*adalah berbeza?*

[8 marks]
[8 *markah*]

(c) Milk is the primary source of nutrition for newborn babies before they are able to eat and digest other food.

Suggest how to promote mothers to feed their newborns with mother's milk.
What advice can be given to them?

Susu merupakan sumber asas nutrisi bagi bayi baru lahir sebelum mereka dapat makan dan mencernakan makanan yang lain.

Cadangkan bagaimana untuk menggalakkan ibu menyusukan bayi baru lahir dengan susu ibu. Apakah nasihat yang boleh diberikan kepada mereka?

[6 marks]
[6 *markah*]

7 (a) Diagram 7.1 shows the changes of glucose level in human blood during fasting.
Rajah 7.1 *menunjukkan perubahan aras glukosa dalam darah manusia semasa berpuasa.*

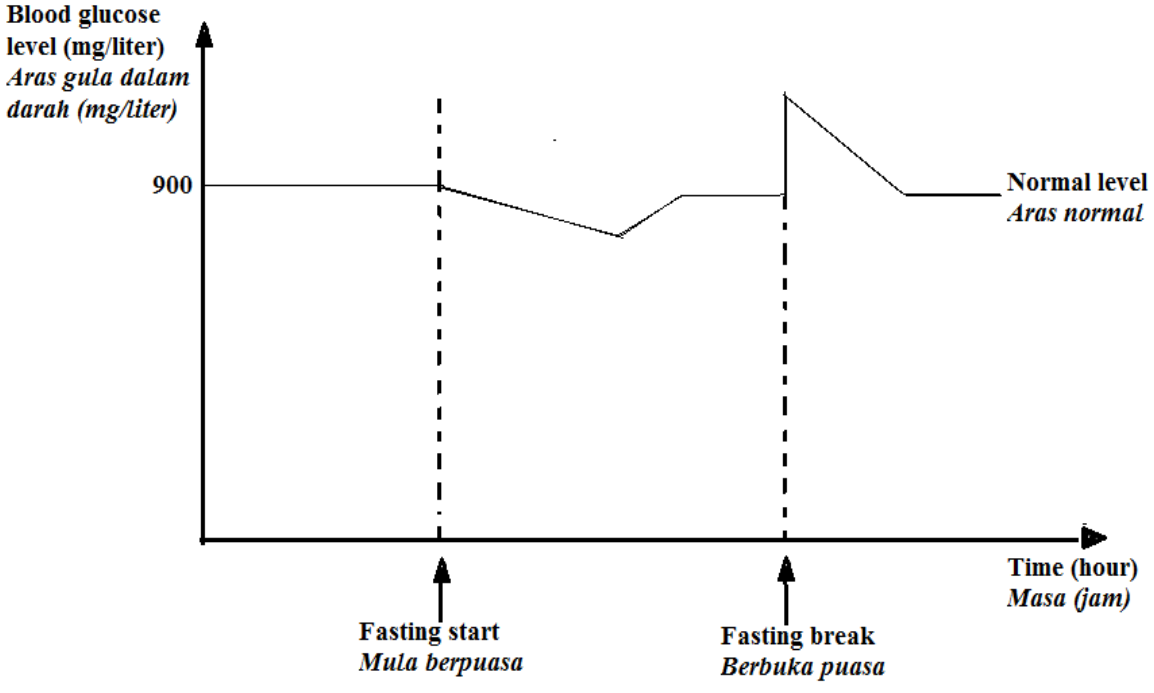


Diagram 7.1
Rajah 7.1

The changes of blood glucose level shown in Diagram 7.1 occur in a healthy human.
Name two organs that involve in the regulatory mechanism.
Suggest how these organs play their roles.

Perubahan aras glukosa darah yang ditunjukkan dalam Rajah 7.1 *berlaku di dalam badan seorang yang sihat.*
Namakan dua organ yang terlibat dalam mekanisme pengawalaturan itu.
Cadangkan bagaimana kedua-dua organ ini memainkan peranan masing-masing

[6 marks]
[6 *markah*]

(b) The transmission of information throughout human body is via the nervous system and the endocrine system.
How these two systems are different?

Penghantaran maklumat dalam badan manusia adalah melalui sistem saraf dan sistem endokrina adalah berbeza.
Bagaimanakah kedua-dua sistem ini berbeza .

[8 marks]
[8 *markah*]

(c) Diagram 7.2 shows the junction between two neurons, labelled as X.
Rajah 7.2 *menunjukkan persimpangan di antara dua neuron, dilabelkan* X.

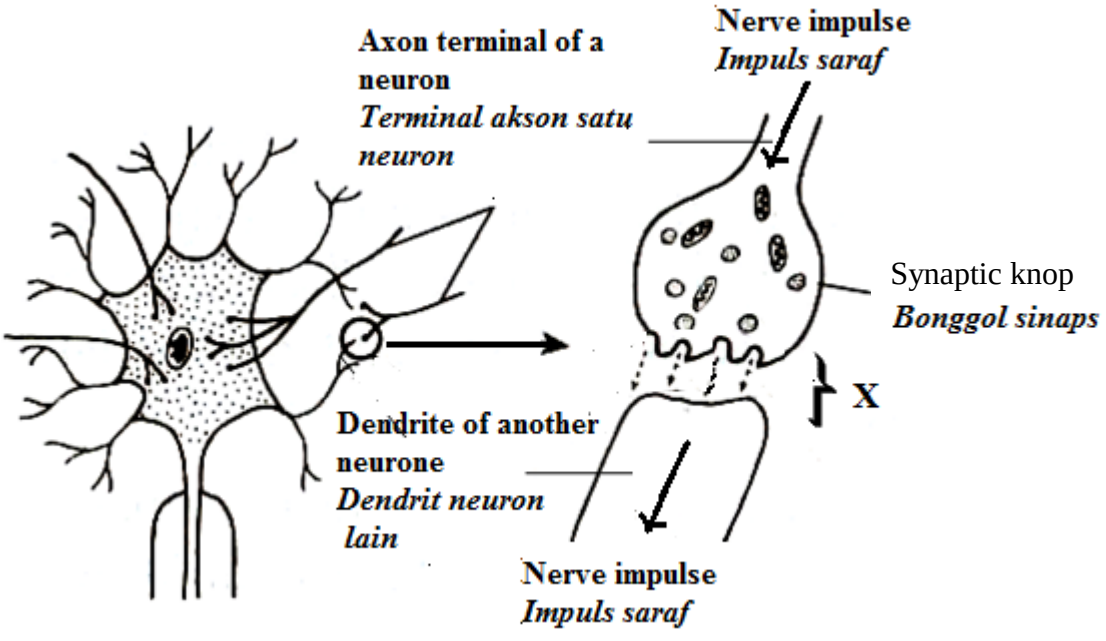


Diagram 7.2
Rajah 7.2

Nerve impulses are transmitted along a neurone in the form of electrical impulses with an action potential of -60mV. However the action potential cannot across gap X. The nerve impulses are carried by chemical made by the neurone that is sending the impulse to the next neurone.

Suggest how the transmission of nerve impulses across gap X is affected after a stimulant drug is injected into human body.

Impuls saraf dijana melintasi suatu neuron dalam bentuk impuls elektrik dengan suatu keupayaan tindakan -60mV. Walaubagaimanapun keupayaan tindakan ini tidak boleh melalui celah X. *Impuls saraf dibawa oleh bahan kimia yang dibina oleh neuron yang menghantar impuls saraf itu kepada neuron yang seterusnya.*

Cadangkan bagaimana penghantaran impuls saraf menerusi celah X *dipengaruhi selepas dadah perangsang disuntik ke dalam badan manusia.*

[6 marks]
[6 *markah*]

8 (a) Diagram 8.1 shows the relationship between light intensity and the processes of photosynthesis and respiration in plants.

Diagram 8.2 the involvement of two organelles in photosynthesis and respiration at the compensation point.

Rajah 8.1 *menunjukkan hubungan antara keamatan cahaya dengan kadar fotosintesis dan kadar respirasi dalam tumbuhan.*

Rajah 8.2 *menunjukkan penglibatan dua organel di dalam satu sel tumbuhan berkaitan proses fotosintesis dan respirasi pada titik pampasan.*

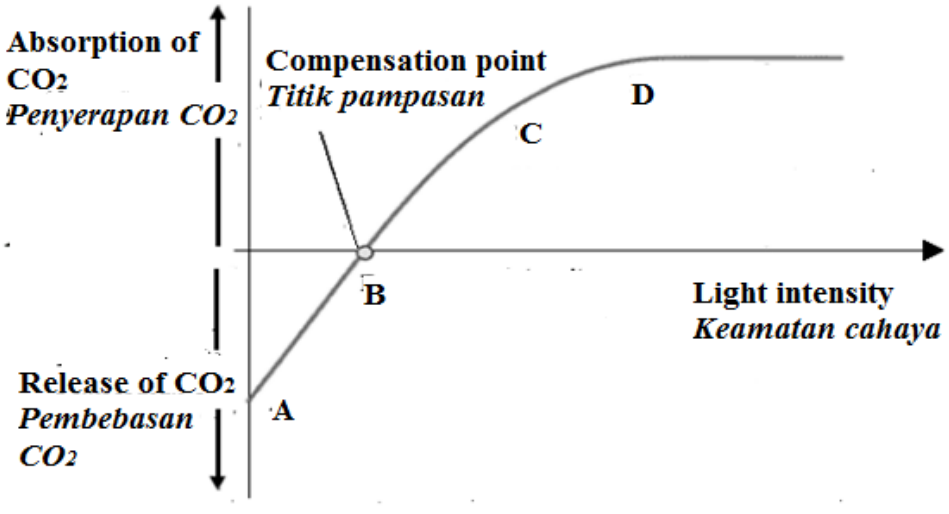


Diagram 8.1
Rajah 8.1

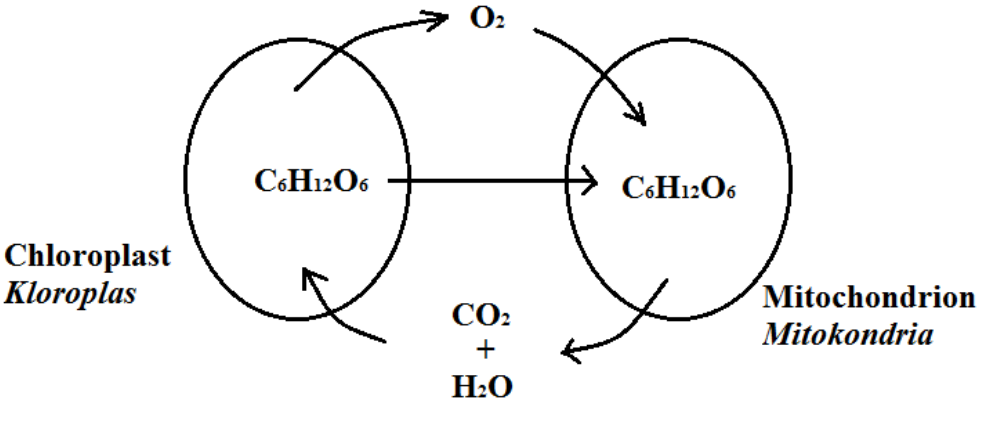


Diagram 8.2
Rajah 8.2

Analyse the graph in Diagram 8.1 and show the relationship between light intensity and the production of crop yield at points A, B, C, and D.

Analisis graf dalam Rajah 8.1 *dan tunjukkan perhubungan antara keamatan cahaya dan hasil tanaman pada titik-titik* A, B, C, *dan* D.

[10 marks]
[10 *markah*]

(b) Diagram 8.3 shows the balanced diet proportion for pregnant woman.
Table 8.4 shows the food intake by a pregnant woman for her dinner.

Rajah 8.3 *menunjukkan nisbah gizi seimbang untuk wanita hamil.*
Jadual 8.4 *menunjukkan makanan yang diambil oleh seorang perempuan hamil untuk makan malam.*

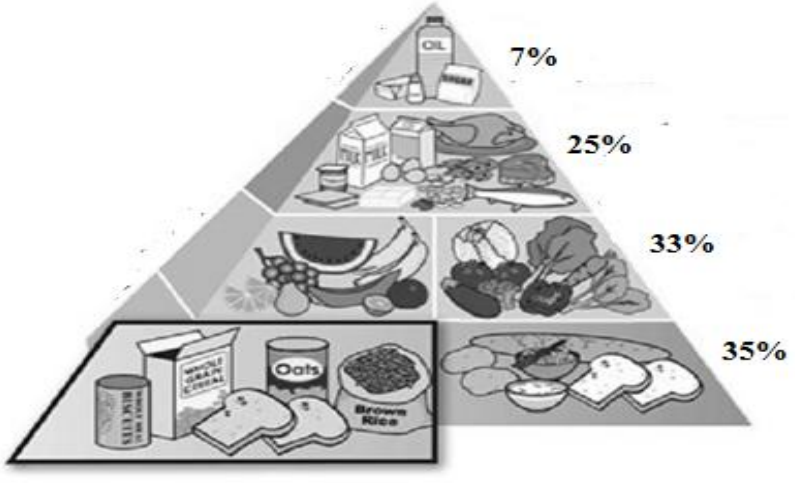


Diagram 8.3
Rajah 8.3

Types of food ***Jenis makanan***	**Quantity taken / g** ***Kuantiti yang diambil /g***
Rice *Nasi*	100
Potato chips *Kentang goreng*	70
Chicken curry *Kari ayam*	70
Fried egg *Telur goreng*	30
Butter *Mentega*	50
Milk *susu*	70
Carbonated drink *minuman berkarbonat*	180
Sausage *Sosej*	80
Sardine *Sardin*	80

Table 8.4
Jadual 8.4

State whether the menu is suitable for the pregnant woman.
Use related biological concepts to support your opinion.

Nyatakan samada menu tersebut sesuai untuk perempuan mengandung itu.
Gunakan konsep biologi yang berkaitan untuk menyokong pendapat anda.

[10 marks]
[10 *markah*]

9 (a) Microorganisms have been used to produce products for thousands of years. The use of microorganisms in biotechnology is continuously developing to contribute in our daily lives.

Diagram 9.1 shows some of the medicinal products manufactured by biotechnology.

Sudah beribu tahun mikroorganisma digunakan dalam penghasilan produk. Penggunaan mikroorganisma dalam bioteknologi telah berkembang secara berterusan untuk menyumbang kepada kehidupan harian kita.

Rajah 9.1 *menunjukkan beberapa produk perubatan yang dihasilkan secara bioteknologi.*

Antibiotic
Antibiotik

Antiserum
Antiserum

Vaccine
Vaksin

Insulin
Insulin

Diagram 9.1
Rajah 9.1

How microorganisms are used in producing the medicinal products shown in Diagram 9.1?

Bagaimanakah mikroorganisma digunakan dalam menghasilkan produk perubatan yang ditunjukkan dalam Rajah 9.1*?*

[10 marks]
[10 *markah*]

(b) **Introducing the first electric hybrid with electrifying performance**

Our engineers have invented the industry's most advanced hybrid vehicle. Unlike other hybrids on the market, ours uses a patented Lithium Polymer battery. It has 40% less volume, it's 25% lighter and 10% more efficient. The battery also has a longer life-span, it comes with a lifetime warranty guarantee. So you can feel good about preserving the environment for the life of your vehicle.

Memperkenalkan hibrid elektrik yang pertama dengan prestasi kuasa elektrik

Jurutera kami telah mencipta kenderaan hibrid yang paling maju. Tidak seperti hibrid di pasaran, kami menggunakan bateri Polimer Lithium yang dipatenkan. Ia mempunyai kurang 40% isipadu, 25% lebih ringan dan 10% lebih cekap. Baterinya tahan lebih lama, ada jaminan seumur hidup. Anda akan berpuashati apabila dapat memelihara alam sekitar dengan kereta anda.

Diagram 9.2
Rajah 9.2

Based on the promotion, discuss the benefits of using an eco-friendly car.

Berdasarkan promosi ini, bincangkan faedah-faedah menggunakan kereta mesra alam.

[10 marks]
[10 *markah*]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

Biology
Kertas 3
Ogos 2014
1 ½ Jam

KEMENTERIAN PENDIDIKAN MALAYSIA

BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH DAN SEKOLAH KECEMERLANGAN

PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2014
PERCUBAAN SIJIL PELAJARAN MALAYSIA

BIOLOGI

Kertas 3

1 jam 30 minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini adalah dalam **dwibahasa**.
2. Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.
3. Kertas soalan ini mengandungi **2 soalan**. Jawab **semua** soalan.
4. Tuliskan jawapan anda bagi Soalan 1 di dalam ruangan yang disediakan pada kertas soalan.
5. Tuliskan jawapan anda bagi Soalan 2 pada kertas jawapan dengan terperinci.
6. Rajah yang diberikan dalam soalan tidak dilukiskan mengikut skala melainkan diberitahu.
7. Markah yang diperuntukkan ditunjukkan di dalam kurungan.
8. Cadangan tempoh melengkapkan Soalan 1 ialah 45 minit, dan Soalan 2 ialah 45 minit.
9. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

Untuk Kegunaan Pemeriksa		
Soalan	**Markah Penuh**	**Markah diperoleh**
1	33	
2	17	
Jumlah	**50**	

Kertas ini mengandungi 8 halaman bercetak

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

Question 1
***Soalan* 1**

A group of students carried out an experiment to study discontinuous variation and the inheritance of traits in plants. Diagram 1.1 shows 2 types of seeds in a fruit of a plant. The students determine the ratio between the number of round seeds and wrinkled seeds in 10 fruits of a legume plant.

Sekumpulan pelajar menjalankan satu eksperimen mengkaji variasi tak selanjar dan pewarisan trait pada tumbuhan. Rajah 1.1 *menunjukkan* 2 *jenis biji di dalam satu buah. Pelajar menentukan nisbah bagi bilangan biji bulat dan biji berkedut di dalam* 10 *buah daripada satu pokok kacang.*

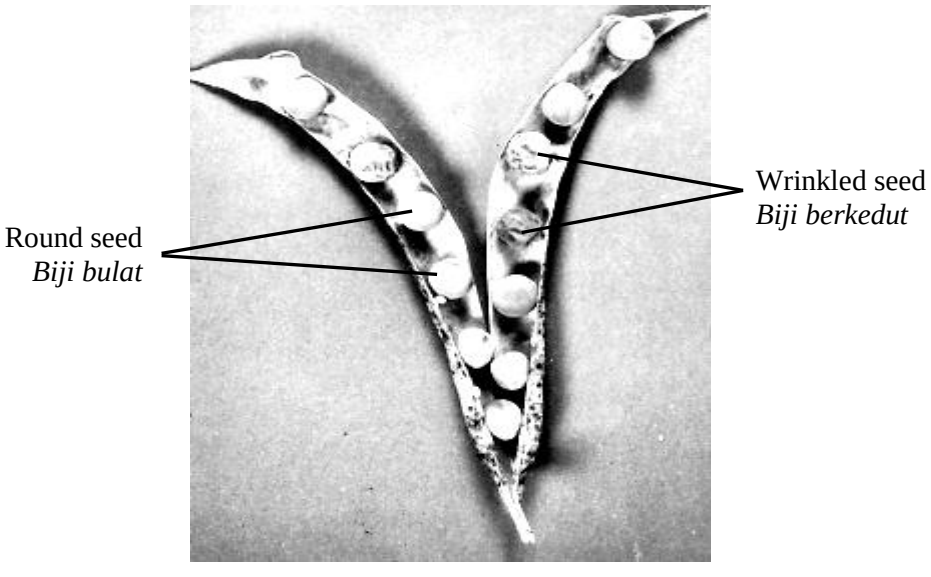


Diagram 1.1
Rajah 1.1

Diagram 1.2 shows the legume seeds taken out from 10 legume fruits.

Rajah 1.2 *menunjukkan biji-biji kacang yang dikeluarkan daripada* 10 *buah kacang.*

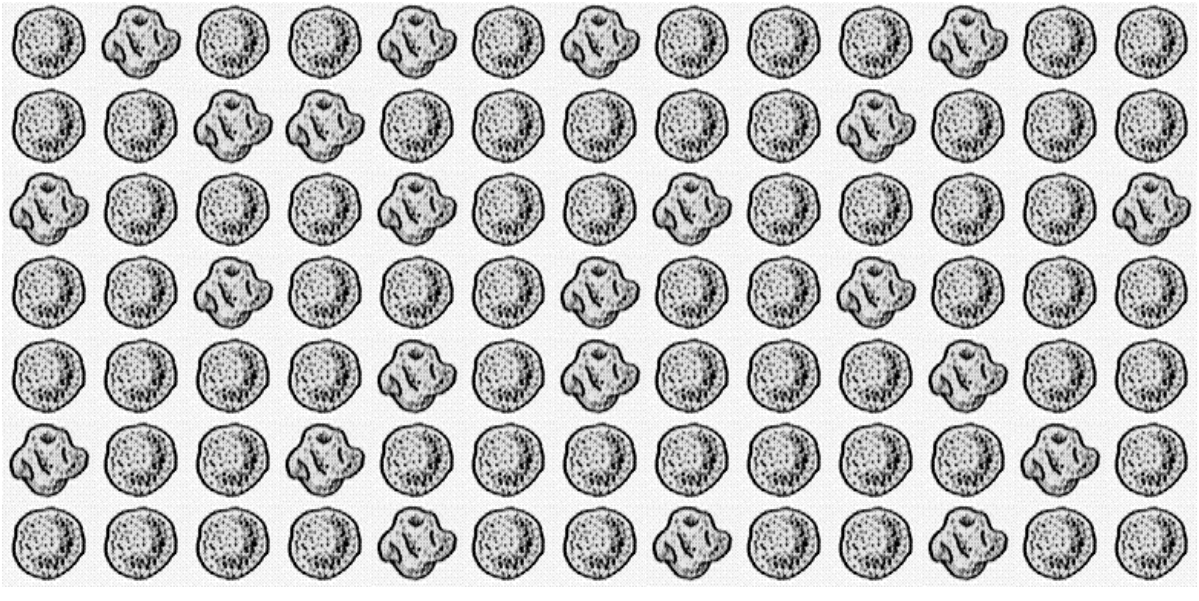


Diagram 1.2
Rajah 1.2

For Examiner's Use

(a) Complete Table 1.3 by stating the number of round seeds and wrinkled seeds as shown in Diagram 1.2.

Lengkapkan Jadual 1.3 *dengan menyatakan bilangan biji bulat dan biji berkedut seperti yang ditunjukkan dalam Rajah* 1.2.

[3 marks]
[3 *markah*]

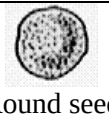
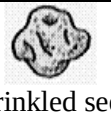
Character / *Ciri* : Type of seed *Jenis biji*	Trait / *Trait*	
	 Round seed *Biji bulat*	 Wrinkled seed *Biji berkedut*
Number of Seed *Bilangan biji*		
Total Number of Seed *Jumlah Bilangan Biji*		

Table 1.3
Jadual 1.3

(b) (i) Based on Table 1.3, state two observations.
Berdasarkan Jadual 1.3, *nyatakan dua pemerhatian.*

Observation 1
Pemerhatian 1:

……

……

Observation 2
Pemerhatian 2:

……

……

[3 marks]
[3 *markah*]

(ii) State the inference for each observation made in (b) (i).
Nyatakan inferens bagi setiap pemerhatian yang dibuat dalam (b) (i).

Inference for observation 1
Inferens bagi pemerhatian 1:

……

……

Inference for observation 2
Inferens bagi pemerhatian 2:

……

……

[3 marks]
[3 markah]

For Examiner's Use

(c) Complete Table 1.4 based on the experiment.
Lengkapkan Jadual 1.4 *berdasarkan eksperimen ini.*

[3 marks]
[3 *markah*]

Variables *Pembolehubah*	Operating the variables *Mengoperasi pembolehubah*
Manipulated variable *Pembolehubah dimanipulasikan* …….....	How to alter the manipulated variable *Bagaimana mengubah pembolehubah yang dimanipulasikan* ……..…..……..……..…..
……..….. …….…..	……..……..…….
Responding variable *Pembolehubah bergerak balas* …….....	How to determine the responding variable *Bagaimana menentukan pembolehubah bergerak balas* ……..…..……..……..…..
……..….. …….……	……..……..…….
Controlled variable *Pembolehubah dimalarkan* …….....	How to maintain the controlled variable *Bagaimana menetapkan pembolehubah dimalarkan* ……..…..……..……..…..
……..….. …….……	……..……..…….

Table 1.4
Jadual 1.4

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

……..……..……...

……..……...

……..……...

[3 marks]
[3 *markah*]

For Examiner's Use

(e) (i) Based Table 1.3, construct a table and record the results of the experiment which include the following aspects:

Berdasarkan Rajah 1.1 *dan Jadual* 1.2, *bina satu jadual dan rekod keputusan eksperimen ini yang meliputi aspek-aspek berikut:*

- Type of seed
  Jenis biji
- Number of seeds
  Bilangan biji
- Ratio of seeds
  Nisbah biji

[3 marks]
[3 *markah*]

(ii) Draw a bar graph of the number of seeds against the type of seed on the graph paper provided in page 7.
Lukiskan satu graf bar bilangan biji melawan jenis biji di atas kertas graf yang disediakan di halaman 7.

[3 marks]
[3 *markah*]

(iii) Based on the bar graph drawn in (e) (ii), state the ratio of the two types of seeds. Explain your answer.
Berdasarkan graf bar yang dilukis dalam (e) (ii), *nyatakan nisbah bagi kedua-dua jenis biji.*
Terangkan jawapan anda.

….....……

.....….……

…….....……

[3 marks]
[3 *markah*]

For Examiner's Use

(f) Based on the experiment, state the operational definition of discontinuous variation.
Berdasarkan eksperimen ini, nyatakan definisi secara operasi variasi tak selanjar.

……

……

……

[3 marks]
[3 *markah*]

(g) The experiment is repeated by using 100 legume fruits that contained 900 seeds.
Predict the number of round seeds and wrinkled seeds.
Explain your answer.

Eksperimen ini diulang dengan menggunakan 100 *buah kacang yang mengandungi 900 biji.*
Ramalkan bilangan biji bulat dan biji berkedut.
Terangkan jawapan anda.

……

……

……

[3 marks]
[3 *markah*]

(h) The following list is are some characters shown in human.
Senarai berikut adalah beberapa ciri pada manusia.

Height *Ketinggian*	Ability to roll tongue *Kebolehan menggulung lidah*	Blood group *Kumpulan darah*
Attachment of earlobe *Lekapan cuping telinga*	Intelligence *Kepintaran otak*	Body weight *Berat badan*

Classify each character to the correct type of variation.
Kelaskan setiap ciri berdasarkan jenis variasi yang betul.

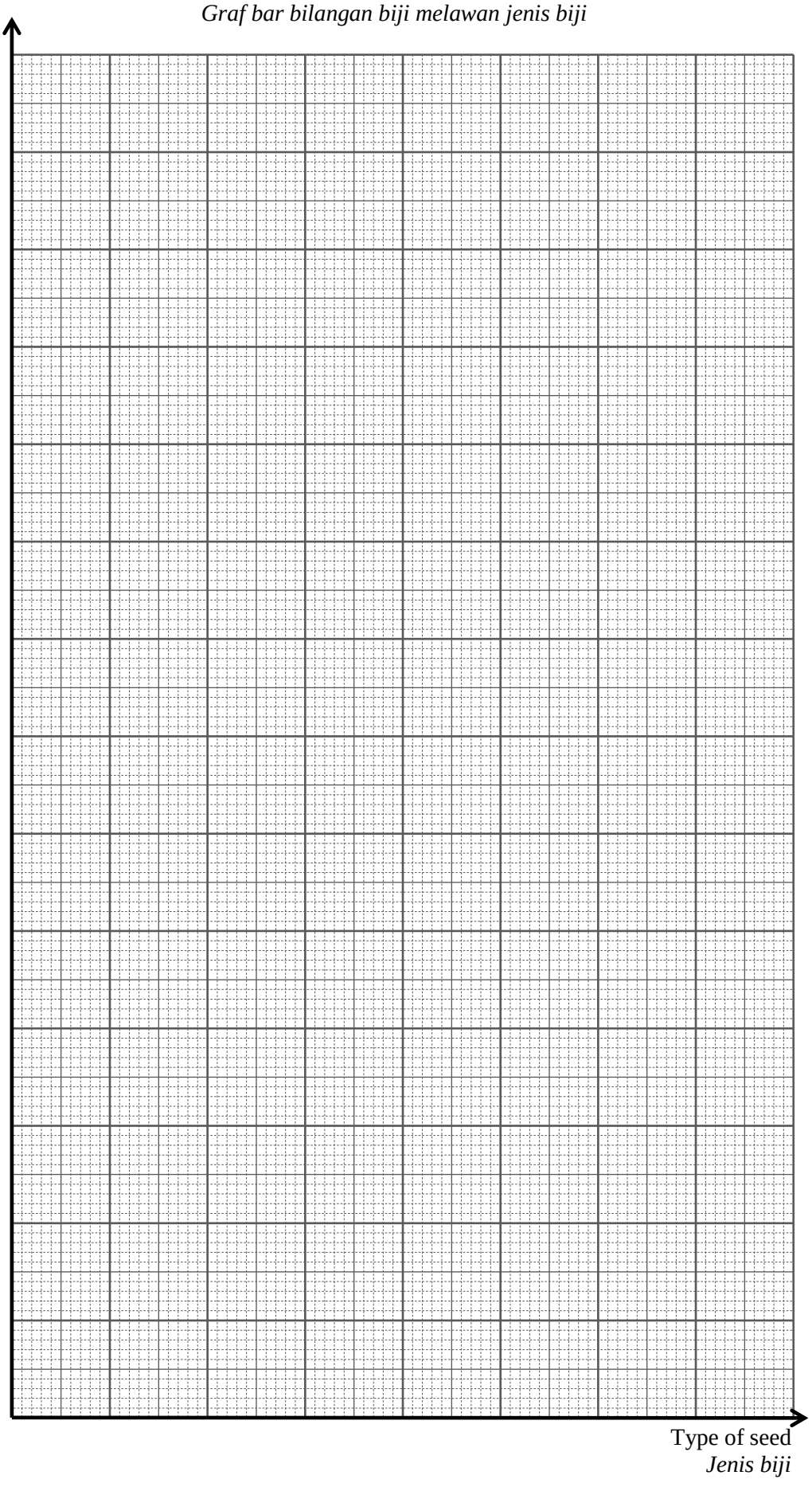
Continuous Variation *Variasi Selanjar*	Discontinuous Variation *Variasi tak Selanjar*

[3 marks]
[3 *markah*]

33

Bar graph of the number of seeds against the type of seed
Graf bar bilangan biji melawan jenis biji

Number of seed
Bilangan biji



Type of seed
Jenis biji

Question 2
***Soalan* 2**

Diagram 2 shows an apparatus used in determining the amount of certain gas in an air sample.
Rajah 2 *menunjukkan satu radas yang digunakan dalam menentukan kandungan gas tertentu di dalam satu sampel udara.*

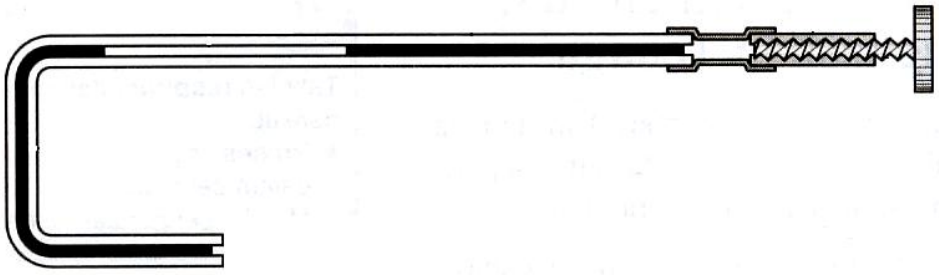


Diagram 2
Rajah 2

By using the apparatus shown, design a laboratory experiment to investigate the percentage of carbon dioxide in exhaled air collected after conducting different types of activity.

Dengan menggunakan radas yang ditunjukkan, rancangkan satu eksperimen makmal mengkaji peratus gas karbon dioksida di dalam udara hembusan nafas yang dikumpulkan selepas menjalankan jenis aktiviti yang berbeza.

Your experimental planning need to include the following aspects:
Perancangan eksperimen anda perlu meliputi aspek-aspek berikut:

- Problem Statement
  Pernyataan masalah
- Variables
  Pembolehubah
- Hypothesis
  Hipotesis
- List of materials and apparatus
  Senarai bahan dan radas
- Experimental procedures
  Prosedur eksperimen
- Presentation of data
  Persembahan data

[17 marks]
[17 *markah*]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

PAPER 1

http://cikguadura.wordpress.com/

No	Answer	No	Answer	No	Answer	No	Answer	No	Answer
1	D	11	B	21	C	31	A	41	A
2	A	12	C	22	C	32	A	42	C
3	A	13	D	23	B	33	D	43	B
4	D	14	C	24	C	34	B	44	A
5	B	15	B	25	D	35	B	45	D
6	D	16	A	26	D	36	A	46	B
7	C	17	C	27	A	37	A	47	C
8	A	18	C	28	A	38	B	48	D
9	C	19	B	29	D	39	B	49	A
10	A	20	C	30	B	40	B	50	D

PAPER 2

http://cikguadura.wordpress.com/

Question 1

No	Criteria	Marks	
(a)	Able to name the molecule X and Y Answers: P1 X : Glucose P2 Y : Fructose (OR vice versa)	 1 1	2
(b) (i)	Able to name process Q Answers: P1 Q:Hydrolysis P2 R : Condensation	 1 1	2
(ii)	Able to explain process hydrolysis /Q Answers: P1 The breaking of sucrose molecule P2 by adding water P3 into glucose and fructose (Any 2)	 1 1 1	2
(c)	Able to explain why the action of enzyme and substrate is specific Sample answers: P1 the active site of an enzyme P2 is compatible/fit/suitable P3 to (specific) substrate	 1 1 1	3
(d) (i)	Able to suggest an enzyme that can be used to remove sucrose stain on cloth Sample answers: P1 - Sucrase	 1	1
(ii)	Able to explain how to increase enzyme reaction. Sample Answer : P1 use warm water P2 optimum temperature for enzyme activity (to hydrolyse sucrose stain) P3 using suitable / optimum pH P4 Use large amount of enzyme/ sucrase (Any 2)	 1 1 1 1	2
TOTAL			**12**

Question 2

No	Criteria	Marks	
2(a)	Able to state the type of skeleton of an earthworm. Answers: Hydrostatic (skeleton)	 1	1
(b)	Able to explain how the earthworm moves forward. Answers: P1 When the circular muscles contract, the longitudinal muscles relax P2 the earthworm becomes thinner and longer P3 When the longitudinal muscles contract, the circular muscles relax P4- the earthworm becomes thicker and shorter P5 the circular and longitudinal muscles contract and relax//antagonistic pair of muscles//to produce peristaltic waves along the body (Any 2)	 1 1 1 1 1	2
(c) (i)	Able to name tissue X Answer: Tendon	 1	3
(ii)	Able to explain the function of X. Sample answers: P1 Tendons attached muscles to bones P2 the dense connective tissue which is tough/strong/inelastic P3 (skeletal) muscles produce movement by exerting the force to pull on the tendons (which are attached to the bones) (Any 2)	 1 1 1	
(d) (i)	Able to name the organelle found in abundance in tissue Y Answer: Mitochondria	 1	3
(ii)	Able to explain answer in (d)(i) Answers: P1 Tissue Y is a flight muscle cells P2 which needs high energy / ATP (produced in the mitochondria in the muscles) P3 for the <u>contraction of muscles</u> (for movement) (Any 2)	 1 1 1	
(e)	Able to explain the effect to the movement if tissue Y is injured. Answers: P1 Y is pectoralis major muscles P2 Y cannot contract / less contraction P3 less force exerted on tendon/X P4 X cannot / less pull wing P5 The bird will not be able to move its wings / downstroke. (Any 3)	 1 1 1 1 1	3
TOTAL			**12**

Question 3

No	Criteria	Marks	
(a)	Able to state the name of structure M and N Answers: Membrane Plasma membrane Fluid N Blood plasma	 1 1	2
(b)	Able to explain why N is isotonic solution to red blood cells Answers: P1 the concentration of N is the same as the fluid in RBC P2 diffusion/movement of water in and out of cell are at equal rate // no net movement of water P3 by osmosis P4 no crenation or hemolysis// remains its normal shape/ unchange (Any 2)	 1 1 1 1	2
(c)	Able to explain the difference between solution P and Q Sample answers: P1 Solution P is **hypotonic** to cell X, solution Q is **hypertonic** to cell Y P2 the concentration of solution P is lower than solution Q, the concentration of solution Q is higher than solution P	 1 1	2
(d)(i)	Able to explain the meaning of high osmotic pressure Sample answers: P1 the concentration of water molecules **is lower than inside of the cell** P2 the concentration of solute **is higher than inside the cell**	 1 1	2
(d)(ii)	Able to explain the function of ADH when the osmotic pressure increases Sample answers: P1 increase the permeability (of the wall of) distal convoluted tubule / collecting duct P2 to increase the **reabsorption** of water (into the blood)	 1 1	2
(d)(iii)	Able to describe the condition of urine produced Sample answers: P1 small in volume/amount P2 more concentrated	 1 1	2
TOTAL			**12**

Question 4

No	Criteria	Marks	
4(a)	Able to name phase X Answer: Interphase	 1	1
(b)	Able to explain the process that occurs in subphase S. Answers: P1 S is synthesis phase P2 by using nucleic acid/ nucleotide P3 in DNA replication P4 DNA in the cell doubled. (Any 3)	 1 1 1 1	3
(c)	Able to explain the effect to mitosis if phase X does not occur. Sample answers: P1 There will be no nutrients/no proteins P2 and no cytoplasmic organelles produced which are needed for mitosis P3 to prepare for cell division // cells growth //duplicating its DNA P4 as a result, mitosis cannot proceed/ occurs. (Any 3)	 1 1 1 1	3
(d)	Able to explain the importance of phase M in producing new cells Answers: P1 Phase M/ Mitosis increases the number of cells (within organism) P2 (results in the) development of multicellular body (from a single cell// growth) P3 (New cells are formed by mitosis can) replace old /damaged cells P4 (because mitosis produce the) exact copies of the cells being replaced P5 (the production of new cells helps in the) regeneration of some body parts of organisms such as star fish. (Any 2)	 1 1 1 1 1	2
(e) (i) (ii)	Able to name process Y Answer : Cytokinesis Able to explain why process Y in plant cell is different from that occurs in animal cell. Answers: P1 Plant cells have cell walls P2 cytokinesis cannot occurs with a cleavage furrow (like animal cells) P3 (Instead) during telophase, a <u>cell plate forms</u> across the cell (in the location of the old metaphase plate). (Any 2)	 1 1 1 1	3
TOTAL			**12**

Question 5

No	Criteria	Marks	
5(a)	Able to explain the formation of cell P. Sample Answers: P1 Pollen mother cell (2n/diploid) undergoes meiosis P2 produces 4 haploid microspores (n) P3 The nucleus of each microspore divide by mitosis P4 to form a tube nucleus and a generative nucleus (Any 2)	 1 1 1 1	2
(b)	Able to explain one difference between the number of nuclei in cell P and the nuclei in the embryo sac. Sample Answers: P1 Cell P contains 2 nuclei, but the embryo sac contains 8 nuclei. P2 The nucleus in each microspore divide by mitosis one time only, but the nucleus of megaspore/embryo sac divides (by mitosis) 3 times.	 1 1	2
(c)(i)	Able to explain what happen to R and S if the pollen tube fails to develop? Sample answers: P1 the male gametes will not reach the ovary P2 will not penetrate the ovule through micropyle// not enter the embryo sac P3 one of the male gamete will not fertilise/fuse with the egg cell//no diploid zygote form P4 another male gamete will not fused with the two polar body//the triploid nucleus/endosperm will not form (Any 3)	 1 1 1 1	3
(c)(ii)	Able to explain double fertilization in plants ensures the survival of plant species. Sample answers: P1 The formation of diploid zygote involves meiosis P2 This produces variation in plants P3 That increase the ability to survive // Avoid extinction P3 Triploid nucleus/endosperm tissues provide nutrients/nourishment to the developing zygote/embryo. (Any 2)	 1 1 1 1	2
(d)(i)	Able to name the phenomenon in producing seedless fruits and give one example of hormone X. Answer: The phenomenon : Parthenocarpy Hormone X: Auxin	 1 1	2
(d)(ii)	Able to suggest one benefit of producing seedless fruit. Sample answers: P1 useful when pollination is poor / for instance, during freezing temperatures// difficult for some flower to pollinate or fertilize P2 can increase the texture//shelf life of fruits//increase sugar content P3 seedless fruits are very desirable because of their convenience to eat without the hard testa. (Any 1)	 1 1 1	1
TOTAL			**12**

Question 6

<table>
<tr><th>No</th><th>Criteria</th><th colspan="2">Marks</th></tr>
<tr><td>6(a)</td><td>Able to explain the mechanisms used by antibody to destroy antigens.

Sample answers:
P1 Agglutination
P2 Antibody binds/join with the antigen
P3 (Antibody causes) the pathogens to clump together
P4 (the clumping) makes it easier for the pathogens to capture/destroy pathogens.

P5 Neutralisation
P6 antibody neutralizes the toxins produced by bacteria
P7 by binding to a toxin molecules
P8 this prevent toxin molecule from attaching to a cell/causes damage
(Any 6)</td><td>1
1
1
1

1
1
1
1</td><td>6</td></tr>
<tr><td>(b)</td><td>Able to explain the differences between the immunity achieve in situation X and situation Y.
Sample answers:
<table><tr><th></th><th>X</th><th>Y</th></tr><tr><td>P1</td><td>(Artificial acquired) active immunity</td><td>(Artificial acquired) passive immunity</td></tr><tr><td>P2</td><td>Body produces own antibody</td><td>Body receive antibody from outside sources</td></tr><tr><td>P3</td><td>(Obtained through) an injection with a vaccine</td><td>(Obtained through) an injection with a serum</td></tr><tr><td>P4</td><td>Dead or weakened pathogen</td><td>Suspension of certain antibodies</td></tr><tr><td>P5</td><td>Does not result in immediate immunity against a disease</td><td>Result immediate immunity against a disease</td></tr><tr><td>P6</td><td>Antibodies need to be synthesized by the body</td><td>Antibodies do need to be synthesized by the body</td></tr><tr><td>P7</td><td>The induced immunity last longer//last long protection</td><td>The immunity lasts only for a short term//temporary protection</td></tr><tr><td>P8</td><td>The antibody is naturally produced by the body</td><td>The antibody is not produced by the body</td></tr><tr><td>P9</td><td>Vaccination is given before a person is infected with the disease</td><td>An injection of antiserum is given when a person is infected with the disease//has a high risk of getting the disease.</td></tr><tr><td>P10</td><td>Need time to synthesized antibody</td><td>Antibody is obtained directly from the source</td></tr><tr><td>P11</td><td>second injection (booster) is necessary to increase the antibody production (to a level that protects the person against the disease)</td><td>second injection is given when the person still infected (and his antibodies has dropped below immunity level)</td></tr><tr><td>P12</td><td>Memory cell present</td><td>No memory cells</td></tr><tr><td>P13</td><td>Protection from diseases like chicken pox/ measles/ rubella/ polio/ hepatitis B/ diphtheria/ tuberculosis.</td><td>Treatment of rabies/ botulism/ tetanus /snake bites.</td></tr></table>(Any 8)</td><td>1
1
1
1
1
1
1
1
1
1
1
1</td><td>8</td></tr>
</table>

(c)	Able to explain why mothers are advised to feed their babies with mother's milk. Sample answers: P1 mother's milk contain colostrum P2 which contains (large number of) antibodies P3 which protect newborns against diseases P4 naturally acquired immunity P5 passive immunity P6 higher in protein (than ordinary milk) and P7 easy to digest P8 lower in lipid (which is hard to digest) P9 Colostrum contains high concentration of leucocytes P10 protect the body from bacteria/ pathogens. (Any 6)	 1 1 1 1 1 1 1 1 1 1	6
TOTAL			**20**

Question 7

No	Criteria	Marks	
(a)	Able to explain the regulatory mechanism of glucose level in human blood. Sample answers: Organs : pancreas liver <u>Blood glucose increase</u> P1 (Beta cell of) pancreas secretes insulin P2 <u>Excess</u> glucose is converted into glycogen P3 Store in the liver P4 <u>More</u> glucose is oxidized / respired / burnt / used / converted into lipid <u>Blood glucose decrease</u> P5 (Alpha cell of) pancreas secretes glucagon P6 Glycogen in the liver P7 is converted into glucose P8 <u>Less</u> glucose is oxidized / respired / burnt / used / converted into lipid (Any 6)	 1 1 1 1 1 1 1 1 1 1	6
(b)	Able to explain the differences between the transmission of information throughout human body via the nervous system and the endocrine system. Sample answers:		8

Nervous system	Aspect	Endocrine system	
Neurons	P1 – Means	Hormones	1
Body cell	P2 – Explanation	Chemicals	1
Fast	P3 – Speed	Slow	1
Electrical signal	P4 – Explanation	Chemical signal	1
Shorter	P5 – Lasting	Longer	1
The effect is immediate	P6 – Explanation	The effect takes longer time	1
One way	P7 – Direction	Depends on target cells/organs	1

		Involves synapse	P8 – Explanation	No junction	1
		One	P9 – Target cell/organs	Can be more than one	1
		Specific	P10 – Explanation	Send to many organs	1
		Neurons	P11 – Via	Blood(stream/vessel)	1
		Use neurons / Not involve duct	P12 – Explanation	No ducts	1
	Example of expected answers: ▪ Nervous system function by the means of neurons while endocrine system by the means of hormones ▪ Neurons are body cells while hormones are chemicals (Any 8)				
(c)	Able to explain the transmission of nerve impulses across a synapse after a stimulant drug is injected into human body. Sample answers: P1 Synapse P2 (The transmission of nerve impulses) increase P3 More stimulation by neurotransmitter/any example P4 More impulses received by adjacent neurons P5 More impulses received by target cell / organs / effectors P6 Neurotransmitters do not disintegrate after stimulating the next neurons P7 More responses P8 Stimulates the body function/metabolism P9 Gives more energy / sense of energetics P10 Example of drugs: nicotine/caffeine/heroin (Any 6)				1 1 1 1 1 1 1 1 1 1	6
TOTAL						**20**

Question 8

No	Criteria	Marks	
(a)	Able to explain how light intensity affects the production of crop yield the relationship between the rate of photosynthesis and the rate of respiration at points A, B, C and D **to** the growth of crop. Sample answer: At A : P1 **In the dark / low light (intensity), only respiration** occurs / large quantity of CO_2 is produced/released P2 As light (intensity) increases the quantity of **CO_2 produce decreases** P3 Because part of CO_2 produced during respiration is used for photosynthesis P4 Sugar is used in respiration more rapidly than it is produced in photosynthesis P5 **No/less growth** P6 **No production of crop**	 1 1 1 1 1 1	10

	At B: P7 (At this point of light inensity) all the CO_2 release from respiration is absorbed for photosynthesis // **no net gain or loss** in CO_2 P8 sugar produced P9 rate of photosynthesis **is equal** to the rate of respiration (this point is called compensation point) P10 **No growth** // **no production of crop** At C: P11 as light intensity increases, the rate of photosynthesis become **faster than / exceed** the rate of respiration P12 (at the same time) excess O_2 is releases (into the atmosphere) P13 Growth occurs P14 Production of crop increases At D: P15 is the light saturation point P16 an increase in light intensity does not increase the rate of photosynthesis // maximum rate of photosynthesis P17 Growth rate is maximum P18 production of crop is maximum (Any 10)	1 1 1 1 1 1 1 1 1 1 1 1	
(b)	Able to state whether the menu provides a balanced diet for the pregnant woman or not and able to discuss. Sample answers: F No/ It is not suitable Reasons P1 Contains too much fat P2 In fried egg / chicken curry / butter P3 Increase cholesterol level P4 Cause excess body weight / hypertension / cardiovascular problems P5 Carbonated drink contains excess sugar P6 Cause diabetics P7 Contains coloring / preservatives / chemicals / acids P8 Cause cancer / gastritis/ allergy P9 Coffee contains caffeine / drugs / chemicals P10 Acting on the nerves P11 Less / no vegetables and fibre P12 Cause constipation P13 Less vitamin / minerals / ferum // other examples P14 for good health / make blood // other examples (Any 10) OR F –Yes/ It is suitable Reasons : P1 Rice/potato chips contain s carbohydrate	 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10

	P2 for energy P3 use for activities / body metabolism P4 chicken curry/fried egg contains protein P5 for building new cells/ growth/ replace old cells P6 butter contains lipid/fat P7 for formation of plasma membrane/ new cells P8 as a stored energy P9 for the production of (steroid) hormone/ testosterone/ progesterone/oestrogen P10 Milk contains calcium/ phosphorus P11 for the formation of teeth and bones of foetus P12 Egg (yolk) contains iron/ferum P13 for the formation of blood cells P14 to prevent anemia. (Any 10)	1 1 1 1 1 1 1 1 1 1 1 1 1	
TOTAL			**20**

Question 9

No	Criteria	Marks	
(a)	Able to explain how microorganisms play role in producing chemicals such as vaccine, antibiotics, antiserum and insulin. Sample answers: <u>Vaccine</u> P1 (prepared) from a weakened or dead/ killed form microorganisms/ pathogen P2 (contains an) agent that resembles a disease-causing microorganism. P3 it stimulates the body immune system P4 to recognize the agent as foreign / foreign proteins P5 and keep record/memory of it, so that the immune system can more easily recognize P6 and destroy these microorganisms P7 Improves immunity to a particular disease. <u>Antibiotics</u> P8 Chemicals produce by microorganisms/fungus/bacteria P9 can stop bacteria from reproducing P10 kill bacteria P11 Penicillin-related antibiotics are from fungus. P12 Streptomycin are from bacteria <u>Antiserum</u> P13 Prepared by injecting certain animal with (specific) pathogens/microorganisms P14 The animal responded and produce antibody P15 Blood serum containing antibody is extracted P16 The most common use in humans is antitoxin/antivenom P17 Antiserum is used to pass on passive immunity to many diseases. <u>Insulin</u> P13 technique use is DNA recombinant P14 Plasmid DNA of a bacterium is used / Escherichia coli is cut using	 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10

	restriction enzyme P15 Introduce/ insert recombinant DNA into a bacterium/ E.coli P16 (recombinant DNA) in bacterium multiply P17 – and produce human insulin (Any 10)	1 1 1	
(b)	Able to discuss the benefits of an eco-friendly vehicle. <u>Sample answers</u> P1 Less the bad impact on the environment. P2 Electric cars don't burn fossil fuels/ used less fossil fuels P3 don't emit CO2 into the atmosphere./ P4 Less Greenhouse gas Emissions P5 reduce global warming P6 many plant and animal species could be saved from extinct P7 reduce other air/gas emissions from gas engines, such as: ground level ozone/particulate / NO2./SO2 P8 reduce air pollution P9 avoid formation of smog/\ P10 reduce acids rain P11 avoid respiratory problelms. P12 Power Efficiency P13 Materials used in eco-friendly cars weigh less than traditional ones P14 Fuel Costs -decrease in fuel costs./save money (Any 10)	 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10
	TOTAL		**20**

PAPER 3
http://cikguadura.wordpress.com/
Question 1

1 (a) [KB0603 - Measuring Using Number]

<table>
<tr><th>Score</th><th>Criteria</th></tr>
<tr><td>3</td><td>Able to state all the number of round seeds, wrinkled seeds and the total number of seeds.

Sample answers:
<table>
<tr><td>Type of seed</td><td>Round seed</td><td>Wrinkled seed</td></tr>
<tr><td>Number</td><td>68</td><td>23</td></tr>
<tr><td>Total Number</td><td colspan="2">91</td></tr>
</table></td></tr>
<tr><td>2</td><td>Able to state any 2 the number of round seeds, wrinkled seeds and the total number of seeds.</td></tr>
<tr><td>1</td><td>Able to state any 1 the number of round seeds, wrinkled seeds and the total number of seeds.</td></tr>
</table>

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

<table>
<tr><th>Score</th><th>Criteria</th></tr>
<tr><td>3</td><td>Able to state any two observations correctly according to the criteria:
C1 Type of seed
C2 Number of seeds

Sample answers:
<u>Horizontal</u>
1. The number of round seeds is 68.
2. The number of wrinkled seeds is 23.
3. The total number of seeds is 91. (No inference for this observation)
<u>Vertical</u>
4. The number of round seeds is more than the (number of) wrinkled seeds.</td></tr>
<tr><td>2</td><td>Able to state any one observation correctly.
or
Able to state any two incomplete observations.

Sample answers for incomplete observations:
<u>Horizontal/Vertical</u>
1. The number of round seeds is more.
2. The number of wrinkled seeds is less.</td></tr>
<tr><td>1</td><td>Able to state any one idea of observation (Any 1 criterion)
Sample answers:
1. Two types of seeds; round seed and wrinkled seed.
2. Character is the type of seed, while traits are round seed and wrinkled seed.</td></tr>
</table>

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

Score	Criteria
3	Able to make **one logical inference for each observation** based on the criteria: C1 Type of seed C2 Dominant trait // Controlled by dominant allele/gene Sample answers: Horizontal/Vertical 1. Round seed is the dominant trait. 2. Round seed is controlled by dominant allele/gene. 3. Wrinkled seed is the recessive trait. 4. Wrinkled seed is controlled by recessive allele/gene.
2	Able to make **one logical inference for any one observation**. *or* Able to make **one logical** and **incomplete inference** base on 2 criteria for each observation. Sample answers: 1. Round seed is the dominant. 2. Wrinkled seed is recessive.
1	Able to make an **idea** of inference with one criterion. Sample answers: 1. Round seed is more. 2. Wrinkled seed is less. [Reject: strong / weak]

For 1(b)(i) Observation and (ii) Inference:

Score	Accurate	Inaccurate	Idea	Wrong
3	✓✓			
2	✓	✓		
	✓		✓	
	✓			✓
		✓✓		
1		✓	✓	
			✓✓	
0		✓		✓
			✓	✓
				✓✓

1 (c) [KB061001 - Controling Variables]

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

Sample answers:
<table>
<tr><th>Variables</th><th>Method to handle the variables</th></tr>
<tr><td>Manipulated variable:
Type of seed / Trait</td><td>
Use / Observe round seeds and wrinkled seeds</td></tr>
<tr><td>Responding variable:
The number of seeds
// Probability / percentage of seed

// The phenotypic ratio</td><td>
(Count and) record the number of seeds
// Calculate (the percentage of seed) using formula: Number of seed x 100% / Total number of seed/91
// Calculate (the ratio) using formula:
No of round seed/68 : No of wrinkled seed/23
91 91
(and change to round number)</td></tr>
<tr><td>Controlled variable:
Type of plant
// Number of fruits</td><td>
Fix / use legume plant
// Use 10 fruits.</td></tr>
</table></td></tr>
<tr><td>2</td><td>Able to state 4 - 5 of the variables and the method to handle the variables correctly.</td></tr>
<tr><td>1</td><td>Able to state 1 - 3 of the variables and the method to handle the variables correctly.</td></tr>
</table>

1 (d) [KB0611 - Making Hypothesis]

<table>
<tr><th>Score</th><th>Criteria</th></tr>
<tr><td>3</td><td>Able to state a hypothesis to show a relationship between the manipulated variable and responding variable and the hypothesis can be validated, base on 3 criteria:
C1 Manipulated variable
C2 Responding variable
C3 Relationship (more/less) (Accept if wrong theory/ratio/1:3/any ratio)

Sample answers:
1. The number/amount/percentage (RV) of round seed (MV) is more (R) than wrinkled seed (MV).
2. Round seed (MV) is more (RV+R) than wrinkled seed (MV).
3. The ratio (RV) of round seeds (MV) and wrinkled seeds (MV) is 3:1 (RV+R).</td></tr>
<tr><td>2</td><td>Able to state less accurate hypothesis to show a relationship between manipulated variable and responding variable base on 2 criteria.

Sample answers:
1. The number/amount/percentage (RV) of round seed is more (R).
2. Round seed is more (RV+R).
3. Round seeds (MV) and wrinkled seeds (MV) is 3:1 (R).
4. The ratio (RV) of round seeds (MV) and wrinkled seeds (MV) is more.</td></tr>
<tr><td>1</td><td>Able to state idea of hypothesis to show a relationship between manipulated variable and responding variable base on 1 criterion.</td></tr>
</table>

	Sample answers: 1. Round seeds are 68. 2. Two type of seeds/trait. 3. The ratio/probability is 3:1

1 (e) (i) [KB0606 - Communicating]

Score	Criteria
3	Able to tabulate a table and fill in data accurately base on **three** criteria: C1 Title: Type of seeds, Number of seeds, Ratio of seeds C2 Data: Round=68, Wrinkled=23 C3 Calculation: 3Round : 1wrinkled Sample answers: <table><tr><th>Type of seed</th><th>Number of seeds</th><th>Ratio of seeds</th></tr><tr><td>Round (seed)</td><td>68</td><td rowspan="2">3Round : 1Wrinkled</td></tr><tr><td>Wrinkled (seed)</td><td>23</td></tr></table>[Accept if the ratio is in a different table]
2	Able to tabulate a table base on **two** criteria.
1	Able to tabulate a table base on **one** criterion.

1 (e) (ii) [KB0608 - Space and Time Relationship]

Score	Criteria
3	Able to draw a bar graph based on **three** criteria below: C1 Labels x-axis (Type of seed: Round and Wrinkled) and Constants scale on y-axis C2 All point transferred correctly C3 2 Bar (Similar width) [Accept 2 similar line] [Accept if touching]
2	Any **two** criteria
1	Any **one** criterion

1 (e) (iii) [KB0607 - Interpreting Data]

Score	Criteria
3	Able to state the ratio of the two types of seeds and explain the answer, based on **three** criteria. C1 The ratio: 3Round : 1Wrinkled C2 Explanation 1: Round seeds is the dominant trait // Wrinkled seed is the recessive trait C3 Explanation 2: Round seed is determined by a dominant allele /gene // Wrinkled seed is determined by recessive alleles/genes *Score 3 if show in the form of a schematic genetic cross/inheritance. Sample answers: 1. (The ratio is) 3Round : 1Wrinkled. Round seeds is the dominant trait which is determined by a dominant allele /gene 2. Symbols: R-round seed (dominant allele), r-wrinkled seed (recessive allele) =1m Trait: Round seed Round seed = 1m Parent: Rr x Rr Offspring: RR Rr Rr rr 3 Round : 1 Wrinkled = 1m

2	Able to state the ratio of the two types of seeds and explain the answer, based on **two** criteria.
1	Able to state the ratio of the two types of seeds and explain the answer, based on **one** criteria or **idea** level (inaccurate 2 criteria).

1 (f) [KB0609 - Define Operationally]

Score	Criteria
3	Able to state the meaning of discontinuous variation operationally, based on the experiment. Criteria: C1 The difference between type of seeds is clear / distinct / with no intermediate C2 Round seed and wrinkled seed C3 Determined by the number of seeds // Depends on the type of seeds / different traits Sample answer: 1. Discontinuous variation is the difference between the types of seeds is clear that are the round seed and the wrinkled seed. The variation is determined by the number of seeds.
2	Able to state **any two** criteria Sample answers: 1. Discontinuous variation is the difference between the types of seeds is clear that are the round seed and the wrinkled seed. 2. Discontinuous variation is the number of round seed and the wrinkled seed.
1	Able to state at idea level only. Sample answers: 1. Discontinuous variation is the difference between the types of seeds. 2. Discontinuous variation is the round seed and the wrinkled seed. 3. Discontinuous variation is the number of seed. 4. Discontinuous variation is the difference between individual of the same species is distinct / very clear / with no intermediate value // Theory

1 (g) [KB0605 - Predicting]

Score	Criteria
3	Able to predict the number of round seeds and wrinkled seeds when the experiment is repeated by using 100 legume fruits that contained 900 seeds, and explain the prediction based on **three** criteria. C1 Prediction: Round seed= 675 // 671-679, Wrinkled seed=225 // 221-229 C2 Explanation 1: The ratio of round seed and wrinkled seed is 3:1 // 3Round:1Wrinkled C3 Explanation 2: Round seeds is the dominant trait // Wrinkled seed is the recessive trait // Round seed is determined by a dominant allele /gene // Wrinkled seed is determined by recessive alleles/genes Sample answer: 1. Round seed is 675 and wrinkled seed is 225. The ratio of round seed and wrinkled seed is 3:1. This is because the round seed is the dominant trait.
2	Able to predict **less accurately** (Prediction+1explanation//Prediction (idea)+ 2 Explanations) Sample answer: 1. Round seed is more (idea). The ratio of round seed and wrinkled seed is 3:1. This is because the round seed is the dominant trait.

1	Able to give **idea** of prediction. (Prediction // Prediction (idea)+ 1 Explanation) Sample answer: 1. Round seed is more (idea). The ratio of round seed and wrinkled seed is 3:1.

1 (h) [KB0602 - Classifying]

Score	Criteria
3	Able to classify each character to the correct type of variation. Sample answer: <table><tr><th>Continuous Variation</th><th>Discontinuous Variation</th></tr><tr><td>Height</td><td>Ability to roll tongue</td></tr><tr><td>Intelligence</td><td>Blood group</td></tr><tr><td>Body weight</td><td>Attachment of earlobe</td></tr></table>
2	Able to classify any 4 correctly.
1	Able to classify any 2 correctly.

Question 2

Problem Statement

Score	Criteria
3	Able to state the problem statement of the experiment **correctly** that include criteria: C1 Manipulate variables : different/type of activity C2 Responding variables : content/amount/percentage of carbon dioxide in exhaled air C3 Relation in question form and question symbol [?] Sample answers: 1. What is the effect of different activity on the content of carbon dioxide in exhaled air? 2. Does type of activity affect the percentage of carbon dioxide in exhaled air? 3. How different activity affecting the amount of carbon dioxide in exhaled air?
2	Able to state the problem statement of the experiment with **two** criteria. Sample answers: 1. What is the effect of activity on the content of carbon dioxide in exhaled air? 2. Does type of activity affect the percentage of carbon dioxide? 3. How different activity affecting the amount of carbon dioxide in exhaled air.
1	Able to state the of problem statement with **one** criteria or at idea level. Sample answers: 1. What is the effect of activity on exhaled air? 2. Does activity affect the carbon dioxide?

Variables

Score	Criteria
3	Able to state the **three variables correctly** Sample answers: Manipulated variable: Different / Type of activity Responding variable: Percentage / concentration of carbon dioxide in exhaled air Controlled variable: (Type of) air (sample) // Exhaled air // Concentration of potassium hydroxide // J-tube // Duration (of activity) [Accept: Time]
2	Able to state **any two variables correctly**
1	Able to state **any two variable correctly**

Hypothesis

Score	Criteria
3	Able to state the hypothesis **correctly** according to the criteria. C1 Manipulate variables C2 Responding variables C3 Relationship of the variables Sample answers: 1. The more vigorous/active the activity, the higher the percentage of carbon dioxide in exhaled air. 2. Vigorous activity gives higher the percentage of carbon dioxide in exhaled air 3. Running on the spot gives highest concentration of carbon dioxide in exhaled air compared to pumping and sitting. [At least 3 activities]
2	Able to state the hypothesis with **two** criteria. Sample answers: 1. Different activities give different percentage of carbon dioxide in exhaled air. 2. Type of activity affects the percentage of carbon dioxide in exhaled air.
1	Able to state the hypothesis with **one** criterion. Sample answers: 1. Different activities affect the carbon dioxide in exhaled air. 2. Type of activity affects exhaled air. 3. Activities change the content of carbon dioxide in exhaled air.

Materials and Apparatus

Score	Criteria
3	Able to state **all** functional materials / 2*materials + 3*apparatus + 2 other apparatus for the experiment. Materials: *Potassium hydroxide (solution), and *water. Apparatus: *J-tube, *basin/trough, *test tube/boiling tube, beaker, delivery tube, and stopwatch. (Accept if not separately)(Reject if in wrong category)
2	Able to state **all** functional materials / 2*materials + 3*apparatus + 1 other apparatus for the experiment.
1	Able to state **all** functional materials / 2*materials + 3*apparatus for the experiment.

Procedure

Score	Criteria
3	Able to state **five** procedures P1, P2, P3, P4 and P5 correctly. P1 : How to Set Up The Apparatus (5P1) P2 : How to Make Constant The Control Variable (1P2) P3 : How to Manipulate The Manipulated Variable (1P3) P4: How to Record The Responding Variable (2P4) P5 : Precaution (1P5)
2	Able to state **three or four** of any procedures P1, P2, P3, P4 and P5 completely.
1	Able to state **two** of any procedures P1, P2, P3, P4 and P5 completely.

Example of Procedure:

1. Fill a basin with water.	P1
2. Place a J-tube in the water.	P1
3. Start the stopwatch.	P1
4. Run on the spot for 5 minutes.	P2
5. Immediately, collect (sample of) exhaled air under water as shown in diagram. [Diagram with 5 functional labels]	P5 P1 P1
6. Trap about 5cm of exhaled air in (the arm of) the J-tube.	P1
7. Place a J-tube in the water for 5 minutes to get a constant temperature. P5 P2	P5 P2
8. Measure under water the (initial) length of the air column and record in a table. P1 P5 P1	2 P1 P5
9. Screw out/Remove the water from the J-tube until about 1cm from the trapped air.	P1
10. Fill 3cm of potassium hydroxide into the J-tube. P1 P2	P1 P2
11. Screw/Move the trapped air (forward and backward) to mix with potassium hydroxide.	P1
12. Place a J-tube in the water for 5 minutes to get a constant temperature. P5 P2	P5 P2
13. Measure under water the (final) length of the air column and record in a table. P4 P5 P4	2 P4 P5
14. Repeat the experiment / steps 1-14 to get average readings.	P5
15. Tabulate the data (in a table).	P4
16. Repeat the experiment / steps 1-14 for other activities; pumping and sitting.	P3

Data

<table>
<tr><th>Score</th><th>Criteria</th></tr>
<tr><td>2</td><td>Able to construct a correct table for the data tabulation.
C1 Titles with correct units (1 mark)
C2 Manipulated variables (at least 3 activities) (1 mark)

Sample answers:
<table>
<tr><td rowspan="2">(Type of) Activities</td><td colspan="2">Length of exhaled air (cm)</td><td rowspan="2">Percentage of carbon dioxide (%)
(in exhaled air)</td></tr>
<tr><td>Initial</td><td>Final</td></tr>
<tr><td>Running on the spot</td><td></td><td></td><td></td></tr>
<tr><td>Pumping</td><td></td><td></td><td></td></tr>
<tr><td>Sitting</td><td></td><td></td><td></td></tr>
</table>
OR
<table>
<tr><td>(Type of) Activities</td><td>Change in length of exhaled air (cm)</td><td>Concentration of carbon dioxide (%)
(in exhaled air)</td></tr>
<tr><td>Running on the spot</td><td></td><td></td></tr>
<tr><td>Pumping</td><td></td><td></td></tr>
<tr><td>Sitting</td><td></td><td></td></tr>
</table>
http://cikguadura.wordpress.com/</td></tr>
</table>

END OF MARKING SCHEME