



KEMENTERIAN PENDIDIKAN MALAYSIA
JABATAN PENDIDIKAN NEGERI SARAWAK

PROGRAM SEMARAK KASIH SPM 2.0 JPN SARAWAK TAHUN 2021

BIOLOGI

KERTAS 1

SET 3

**PROGRAM
SEMARAK KASIH SPM 2.0
TAHUN 2021
JABATAN PENDIDIKAN NEGERI SARAWAK**

**BIOLOGI
(4551/1)**

**PRAKTIS KERTAS 1
SET 3**

PENGENALAN

Program Semarak Kasih yang dilaksanakan pada tahun 2020 telah mendapat sambutan yang menggalakkan daripada warga pendidik dan murid, khususnya calon SPM 2020. Sehubungan dengan itu, pada tahun 2021 ini, Sektor Pembelajaran, Jabatan Pendidikan Negeri Sarawak mengadakan Program Semarak Kasih SPM 2.0 untuk membantu guru dan calon SPM menghadapi peperiksaan SPM 2021.

Modul yang dihasilkan disertakan dengan sampel Jadual Spesifikasi Ujian (JSU) dan sampel item/soalan mengikut format baharu peperiksaan SPM mulai 2021 untuk dijadikan bahan panduan dan rujukan guru-guru dan juga sebagai bahan latihan/ulangkaji kepada calon-calon SPM 2021 di semua sekolah menengah di negeri Sarawak.

OBJEKTIF PROGRAM

1. Memastikan calon SPM menguasai format baharu Peperiksaan SPM 2021.
2. Memastikan calon SPM mempunyai bahan pembelajaran yang berfokus ke arah peperiksaan SPM.
3. Meningkatkan pencapaian akademik calon SPM 2021.
4. Melonjakkan keputusan SPM 2021 Negeri Sarawak

SENARAI KANDUNGAN

Bil.	Perkara	Muka surat
1	Format Kertas Peperiksaan SPM Mulai Tahun 2021	2
2	Latihan - Praktis Biologi 4551/1: Set 3	3 – 25
3	Skema Jawapan/Pemarkahan	26
4	LAMPIRAN: Sampel Jadual Spesifikasi Ujian (JSU) untuk Praktis Biologi 4551/1: Set 3	27-32

SENARAI AHLI PANEL PEMBINA MODUL SEMARAK KASIH SPM 2.0

Bil.	Nama Guru	Sekolah	PPD
1.	Irene Lue Leh Ping (Ketua)	SMK St. Anthony	Sarikei
2.	Lee Hou Giap	Kolej DPAH Abdillah	Kuching
3.	Wong Ha Ching	SMK St. Anthony	Sarikei
4.	Wong Sai You	SMK Tinggi Sarikei	Sarikei
5.	Ho Kent Chiew	SMK Muara Tuang	Samarahan
6.	Hu Lee Lee	SMK Methodist Sibu	Sibu
7.	Wong Wei Wei	SMK Merbau	Miri

PENYELARAS

Bil.	Nama Pegawai	Stesen Bertugas
1	Evelin anak Medong	Unit Sains dan Matematik, JPN Sarawak
2	Abdul Rahman bin Bujang	Unit Sains dan Matematik, JPN Sarawak

FORMAT INSTRUMEN PEPERIKSAAN SPM MULAI TAHUN 2021
BAGI MATA PELAJARAN BIOLOGI (KOD: 4551)

BIL	PERKARA	KERTAS 1 (4541/1)	KERTAS 2 (4541/2)	KERTAS 3 (4541/3)
1	Jenis Instrumen	Ujian Bertulis		Ujian Amali
2	Jenis Item	Objektif Aneka Pilihan	<ul style="list-style-type: none"> • Subjektif Berstruktur • Subjektif Respons Terhad • Subjektif Respons Terbuka 	Subjektif Berstruktur
3	Bilangan Soalan	40 soalan (40 markah) (Jawab semua soalan)	Bahagian A: <ul style="list-style-type: none"> • 8 soalan (60 Markah) (Jawab semua soalan) • Bahagian B: (20 Markah) • 2 soalan (Jawab 1 soalan) Bahagian C: (20 Markah) <ul style="list-style-type: none"> • 1 soalan 	3 item (Jawab mengikut subjek yang didaftar)
4	Jumlah Markah	40 markah	100 markah	15 markah bagi setiap item
5	Konstruk	<ul style="list-style-type: none"> • Mengingat • Memahami • Mengaplikasi • Menganalisis 	<ul style="list-style-type: none"> • Mengingat • Memahami • Mengaplikasi • Menganalisis • Menilai • Mencipta 	Kemahiran proses sains
6	Tempoh Ujian	1 jam 15 minit	2 jam 30 minit	40 minit + 5 minit setiap item (5 minit: sesi merancang) (40 minit: masa menjawab soalan)
7	Cakupan Konteks	Standard kandungan dan standard pembelajaran dalam Dokumen Standard Kurikulum dan Pentaksiran (DSKP) KSSM (Tingkatan 4 dan 5)		
8	Aras Kesukaran	Rendah : Sederhana : Tinggi 5 : 3 : 2		
9	Kaedah Penskoran	Dikotomus	Analitikal	
10	Alat Tambahan	Kalkulator saintifik		

PRAKTIS BIOLOGI 4551/1**SET 3**

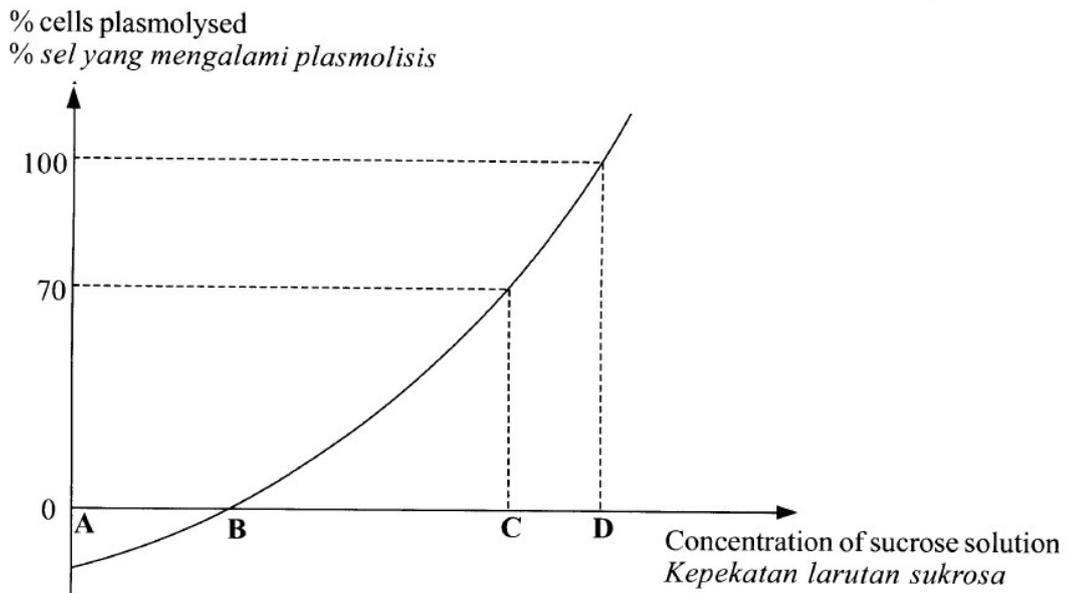
- 1 Sel pipi manusia dan sel mesofil berspan daun telah diperiksa di bawah mikroskop. Yang manakah struktur yang dapat diperhatikan pada kedua-dua sel?

A human cheek cell and a spongy mesophyll cell from a leaf are examined under a microscope. Which structures are seen in both cells?

- A Membran sel, nukleus dan sitoplasma
Cell membrane, nucleus and cytoplasm
- B Dinding sel, membran sel dan nucleus
Cell wall, cell membrane and nucleus
- C Sitoplasma, dinding sel dan membran sel
Cytoplasm, cell wall and cell membrane
- D Nukleus, sitoplasma dan dinding sel
Nucleus, cytoplasm and cell wall

- 2 Rajah 1 ialah graf yang menunjukkan peratusan sel bayam yang mengalami plasmolysis apabila direndam di dalam larutan sukrosa yang berbeza kepekatan.

Diagram 1 is a graph which shows the percentage of spinach cells plasmolysed when immersed in sucrose solution of different concentration.

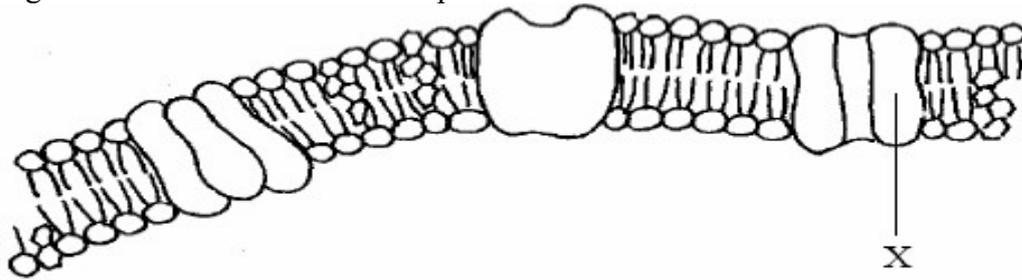


Rajah 1
Diagram 1

Antara kepekatan larutan sukrosa, A, B, C dan D, yang manakah isotonic pada sel bayam?

Which concentration of sucrose solution, A, B, C or D, is isotonic to spinach cells?

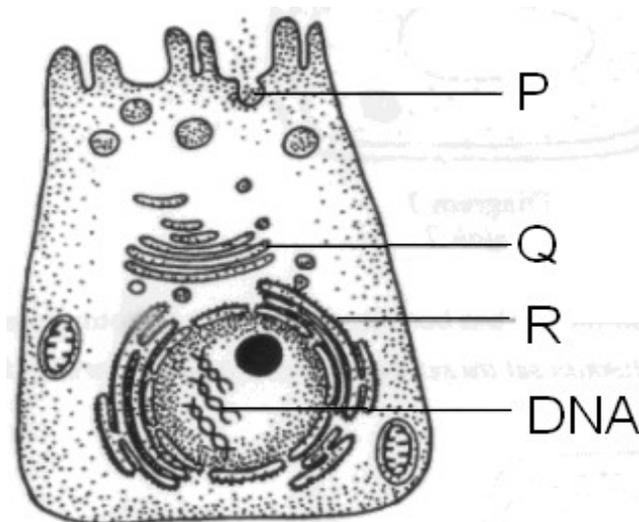
- 3 *Rajah 2 menunjukkan struktur membrane plasma.*
Diagram 2 shows the structure of a plasma membrane



Rajah 2
Diagram 2

Apakah X?
What is X?

- A *Fosfolipid*
Phospholipids
- B *Glikoprotein*
Glycoprotein
- C *Protein pembawa*
Carrier protein
- D *Protein liang*
Channel protein
- 4 *Rajah 3 menunjukkan organel P, Q dan R yang terlibat dalam sintesis dan rembesan enzim ekstrasel. Proses ini bermula di DNA.*
Diagram 3 shows organelles P, Q and R that are involved in the synthesis and secretion of an extracellular enzyme. The process begins at DNA.



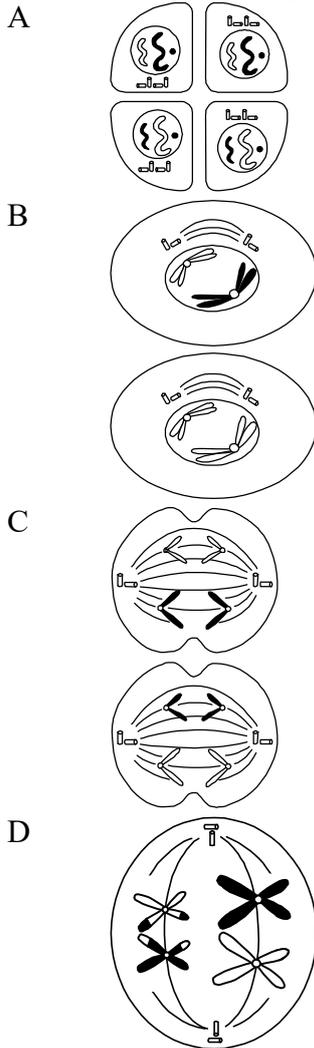
Rajah 3
Diagram 3

Urutan manakah yang betul dalam penghasilan enzim ekstrasel?

Which sequence is correct in the production of the extracellular enzyme?

- A P → Q → R
- B R → Q → P
- C Q → P → R
- D R → P → Q

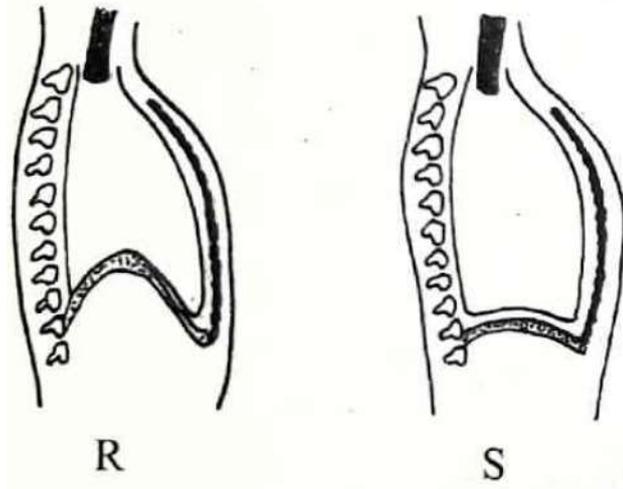
- 5 Rajah manakah yang menunjukkan anafasa II?
 Which of the following diagram shows Anaphase II?



- 6 Di manakah berlakunya proses glikolisis?
 Where does the glycolysis process occur?

- A Mitokondrion
 Mitochondrion
- B Sitoplasma
 Cytoplasm
- C Vakuol
 Vacuole
- D Ribosom
 Ribosome

- 7 Rajah 4 menunjukkan mekanisme pernafasan manusia.
Diagram 4 shows the breathing mechanism in humans.



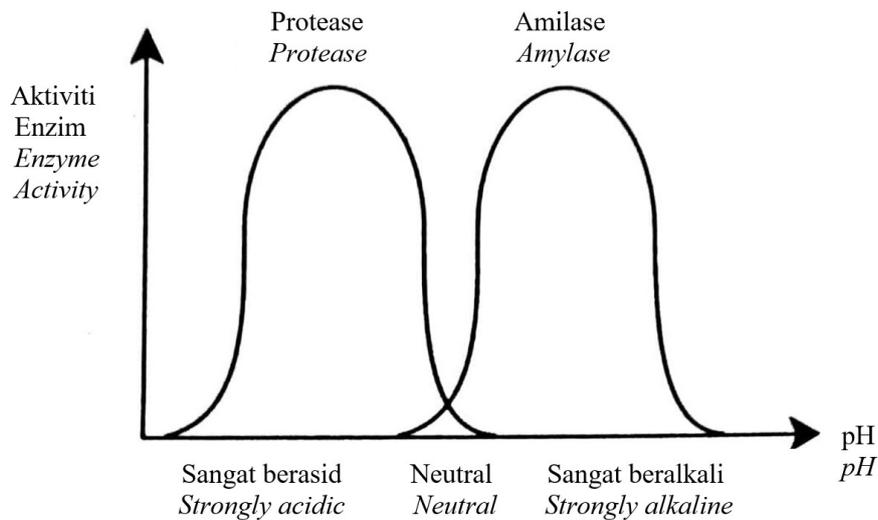
Rajah 4
Diagram 4

Pernyataan yang manakah menerangkan rajah dengan betul?

Which statements explain the diagram correctly?

	R	S
A	Diafragma mendatar <i>Diaphragm flattened</i>	Diafragma berbentuk kubah <i>Diaphragm in dome shape</i>
B	Otot intercostal luar mengecut <i>External intercostal muscles contract</i>	Otot intercostal luar mengendur <i>External intercostal muscle relax</i>
C	Isipadu peparu berkurang <i>Lung volume decreases</i>	Isipadu peparu bertambah <i>Lung volume increases</i>
D	Tekanan udara dalam rongga toraks rendah <i>Low air pressure in the thoracic cavity</i>	Tekanan udara dalam rongga toraks tinggi <i>High air pressure in the thoracic cavity</i>

- 8 Rajah 5 menunjukkan kesan pH terhadap aktiviti dua jenis enzim.
 Diagram 5 shows the effect of pH on the activity of two types of enzymes.



Rajah 5
 Diagram 5

- Bahagian saluran pencernaan yang manakah enzim-enzim ini paling aktif?
 In which parts of the alimentary canal would these enzymes be most active?

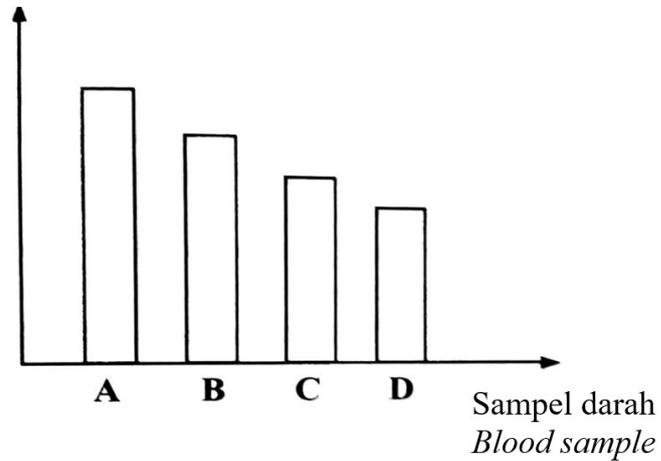
	Amilase <i>Amylase</i>	Protease <i>Protease</i>
A	Perut <i>Stomach</i>	Kolon <i>Colon</i>
B	Duodenum <i>Duodenum</i>	Esofagus <i>Oesophagus</i>
C	Perut <i>Stomach</i>	Duodenum <i>Duodenum</i>
D	Duodenum <i>Duodenum</i>	Perut <i>Stomach</i>

- 9 Seorang individu yang menggunakan perentak tiruan tidak digalakkan melakukan aktiviti cergas.
 Pernyataan manakah yang menerangkan situasi tersebut?
 A person using artificial pacemaker is not encouraged to carry out vigorous activity. Which statement explains the situation?
- A Perentak tiruan menghalang pemindahan impuls elektrik ke jantung untuk meningkatkan kadar denyutan jantung dengan tepat.
Artificial pacemaker blocks the transmission of electrical impulses to the heart that increases the heart beat rate appropriately.
 - B Perentak tiruan menyebabkan pengenduran ruang atria dan ventrikel jantung untuk meningkatkan kadar denyutan jantung dengan tepat.
Artificial pacemaker triggers the relaxation of atria and ventricles of the heart chambers that increases the heart beat rate appropriately.
 - C Denyutan jantung dikawal oleh perentak tiruan di mana mungkin tidak dapat meningkatkan kadar denyutan jantung dengan tepat.
Heart beat is controlled by artificial pacemaker which may not be able to increase the heart beat rate appropriately.
 - D Denyutan jantung diperlahankan oleh perentak tiruan.
Heart beat is slowed down by artificial pacemaker.

- 10 Rajah 6 menunjukkan carta palang bagi kepekatan oksigen dalam sampel darah yang diambil daripada salur darah yang berlainan.

Diagram 6 shows a bar chart of oxygen concentration in blood samples taken from different blood vessels.

Kepekatan oksigen
Oxygen concentration



Rajah 6
Diagram 6

Antara sampel darah A, B, C dan D yang manakah diambil daripada vena pulmonari?
Which blood samples A, B, C or D is taken from the pulmonary vein?

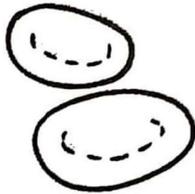
- 11 Sel darah yang manakah menghasilkan antibody?

Which blood cell produces antibody?

A



B



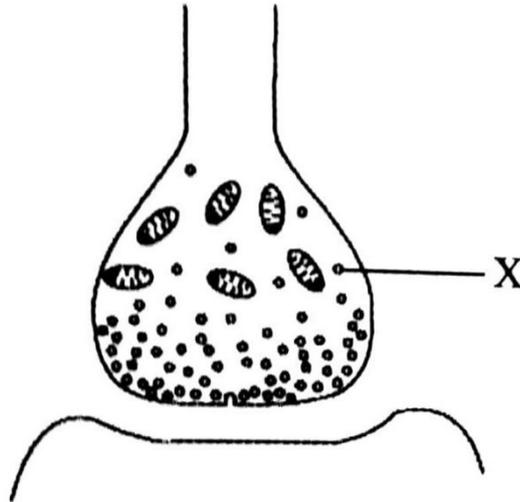
C



D



- 12 Rajah 12 menunjukkan keratan rentas sinaps.
 Diagram 12 shows the cross section of a synapse.

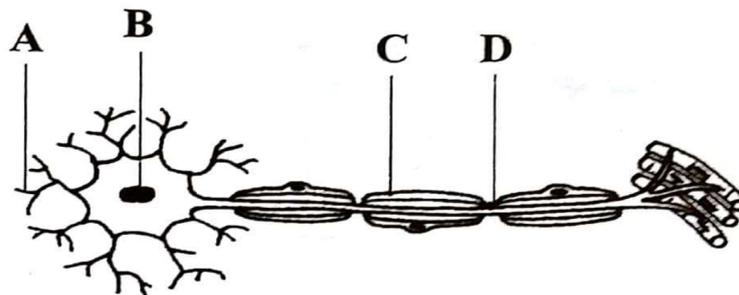


Rajah 7
 Diagram 7

Apakah fungsi X?

What is the function of X?

- A Menghasilkan tenaga
Produces energy
 - B Menghasilkan impuls
Produces impulse
 - C Menghasilkan hormon
Produces hormones
 - D Menghasilkan neurotransmitter
Produces neurotransmitter
- 13 Rajah 13 menunjukkan struktur neuron motor.
 Diagram 13 shows the structure of a motor neurone.



Rajah 8
 Diagram 8

Antara bahagian berlabel A, B, C dan D yang manakah mengalirkan impuls saraf keluar dari badan sel?

Which part labelled A, B, C or D conducts nerve impulses away from the cell body?

- 14 Berikut adalah simptom-simptom yang disebabkan oleh kekurangan hormon tertentu pada seorang dewasa.

The following are symptoms caused by lack of certain hormone in an adult.

Kadar denyutan jantung rendah
Rate of heart beat is low

Metabolisme rendah
Low metabolism

Berat bertambah
Weight gain

Hormon manakah menyebabkan simptom-simptom tersebut?

Which hormone causes the symptoms?

- A Insulin
Insulin
 - B Tiroksina
Thyroxine
 - C Adrenalina
Adrenaline
 - D Hormon pertumbuhan
Growth hormone
- 15 Rajah berikut menunjukkan keratan rentas kulit manusia.
The diagram below shows a section through the human skin.

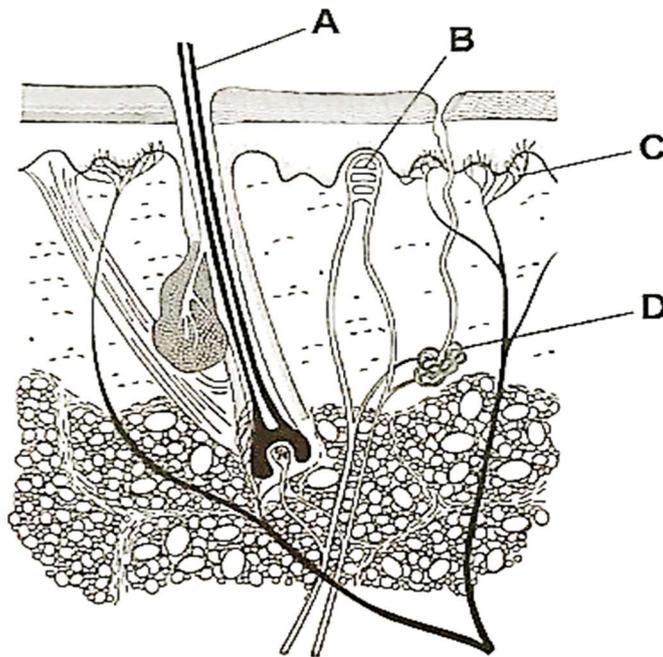


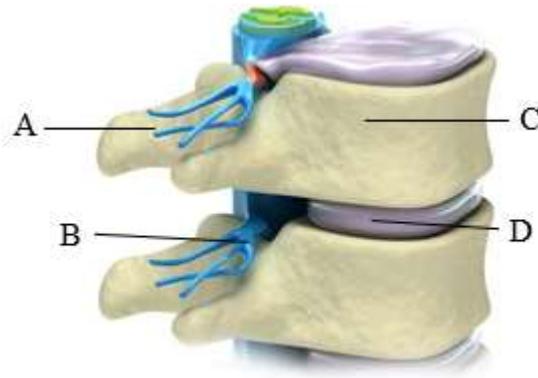
Diagram 8

Rajah 8

Antara bahagian A,B,C dan D yang manakah mengesan perubahan suhu di dalam kulit?

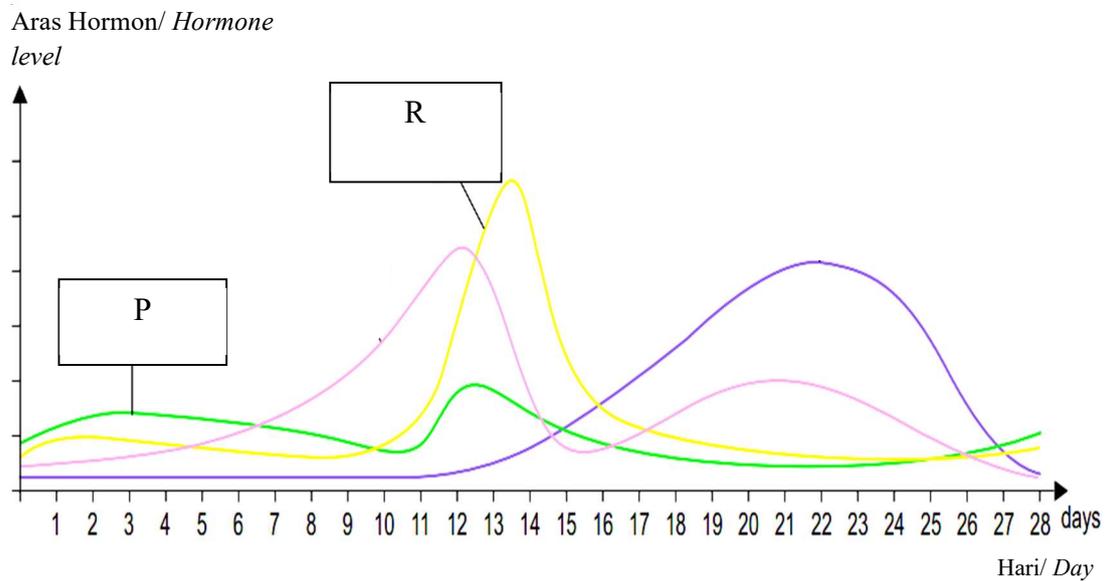
Which structure A, B, C or D detects changes in skin temperature?

- 16 Puan Fatimah, seorang ibu yang berusia 45 tahun mengalami masalah semasa melakukan aktiviti hariannya. Dia sentiasa mengalami kesakitan dan ketegangan pada sendi lutut. Apakah masalah kesihatan yang kemungkinan besar dialami oleh Puan Fatimah?
Madam Fatimah who is a 40 year old mother was facing problem while carry out her daily activities. She always experienced painful and stiffness at the knee joint. What is the most possible health problem experienced by Madam Fatimah?
- A Osteomalasia
Osteomalacia
 - B Arthritis
Arthritis
 - C Osteoporosis
Osteoporosis
 - D Skoliosis
Scoliosis
- 17 Antara bahagian A, B, C dan D yang manakah cakera intervertebral dalam rangka manusia?
Which part, A, B, C or D is intervertebral disc in human skeleton?



Rajah 9
Diagram 9

- 18 Rajah 10 ialah graf yang menunjukkan perubahan aras hormon semasa kitaran haid seorang perempuan.
 Diagram 10 is a graph shows the changes in the level of hormones during a woman's menstrual cycle.

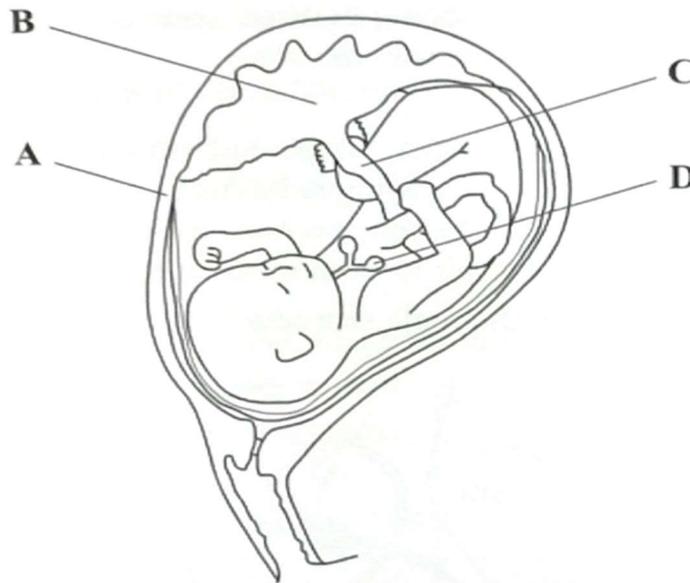


Rajah 10
 Diagram 10

Apakah hormon P dan R?
 What are hormones P and R?

	Hormon P <i>Hormone P</i>	Hormon R <i>Hormone R</i>
A	Hormon Perangsang Folikel <i>Follicle Stimulating Hormone</i>	Progesteron <i>Progesterone</i>
B	Hormon Peluteinan <i>Luteinizing Hormone</i>	Hormon Perangsang Folikel <i>Follicle Stimulating Hormone</i>
C	Progesteron <i>Progesterone</i>	Estrogen <i>Oestrogen</i>
D	Hormon Perangsang Folikel <i>Follicle Stimulating Hormone</i>	Hormon Peluteinan <i>Luteinizing Hormone</i>

- 19 Rajah 11 menunjukkan perkembangan fetus.
Diagram 11 shows a developing foetus.

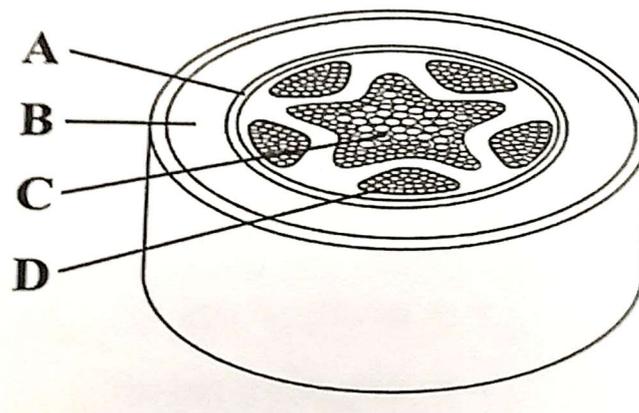


Rajah 11
Diagram 11

Pada bahagian manakah, A, B, C dan D, merupakan tapak pertukaran gas oksigen dan karbon dioksida berlaku antara fetus dan ibu?

At which part, A, B, C or D, is the exchange site of oxygen and carbon dioxide between the foetus and the mother?

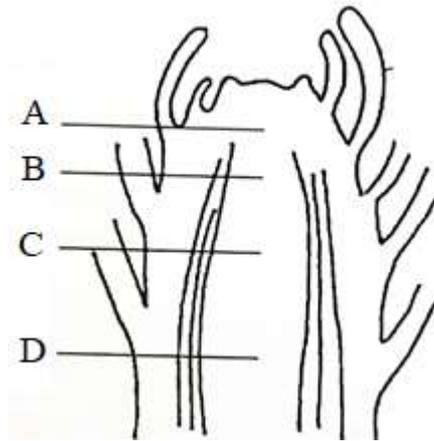
- 20 Rajah 12 menunjukkan keratan rentas akar tumbuhan.
Diagram 12 shows a cross section of a root.



Rajah 12
Diagram 12

Antara bahagian, A, B, C dan D, manakah yang berfungsi mengangkut air ke daun?
At which part, A, B, C or D is responsible in transporting water to the leaves?

- 21 Rajah 13 menunjukkan keratan membujur dalam hujung pucuk.
Diagram 13 shows the longitudinal section of a shoot tip.

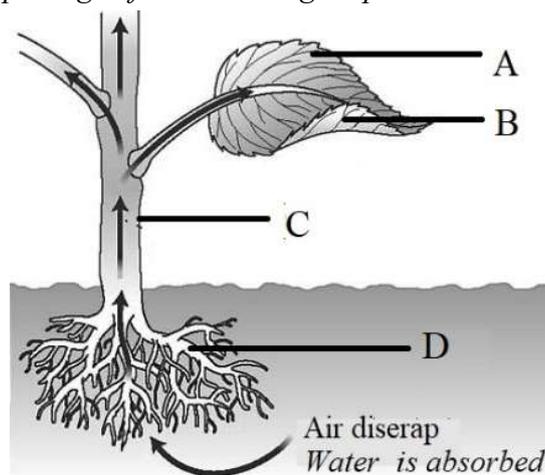


Rajah 13
Diagram 13

Antara bahagian, A, B, C dan D, manakah yang terletak tisu kekal selepas pertumbuhan sel berlaku?

Which part, A, B, C or D, consists of permanent tissues after the cell growth?

- 22 Rajah 14 menunjukkan pergerakan air dalam tumbuhan.
Diagram 14 shows the passage of water through a plant.



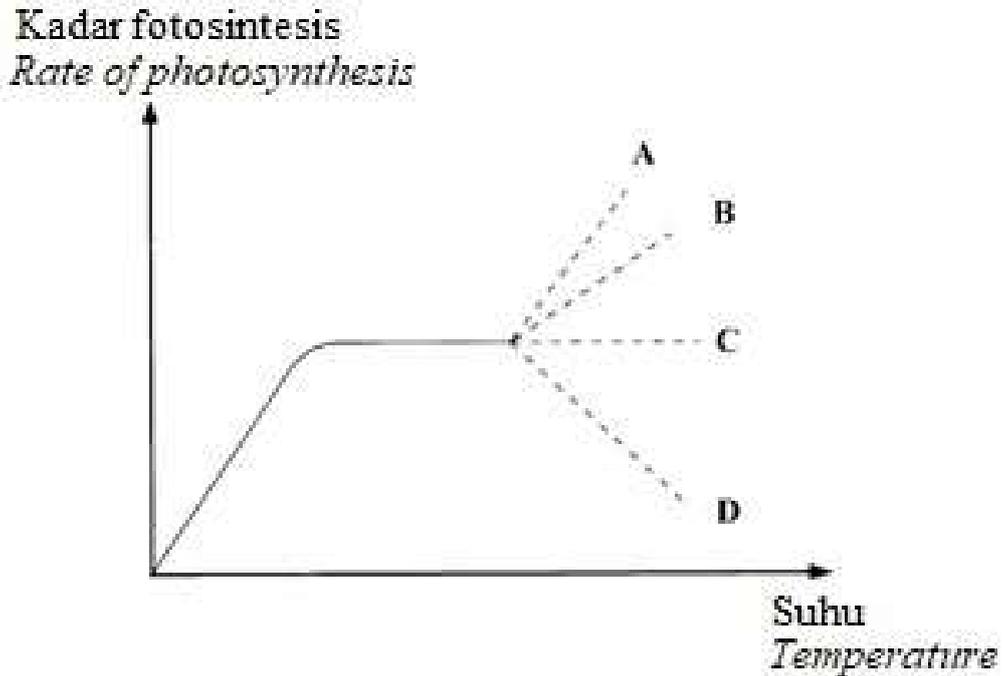
Rajah 14
Diagram 14

Bahagian manakah yang berlabel A, B, C atau D pada rajah menunjukkan proses transpirasi berlaku?

Which part of the diagram labelled A, B, C or D shows the process of transpiration occur?

- 23 Rajah 15 ialah graf yang menunjukkan kesan suhu terhadap kadar fotosintesis bagi suatu tumbuhan.

Diagram 15 is a graph which shows the effects of temperature on the rate of photosynthesis in a plant.



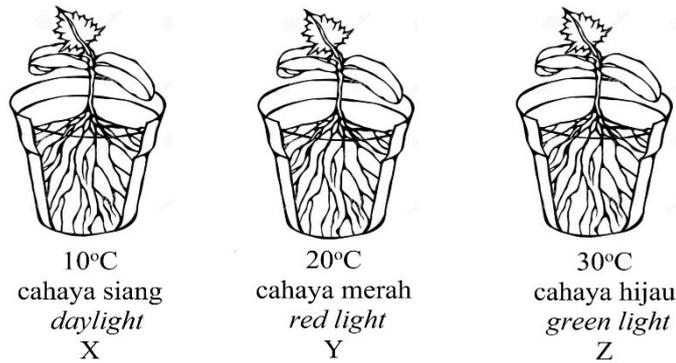
Rajah 15

Diagram 15

Bahagian manakah yang berlabel A, B, C atau D pada graf, menunjukkan kadar fotosintesis selepas daun-daun dibuang?

Which part of the graph labelled A, B, C or D shows the rate of photosynthesis after the leaves are detached?

- 24 Rajah 16 menunjukkan tiga tumbuhan dengan luas permukaan daun yang sama.
Diagram 16 shows three plants with identical leaf surface areas.



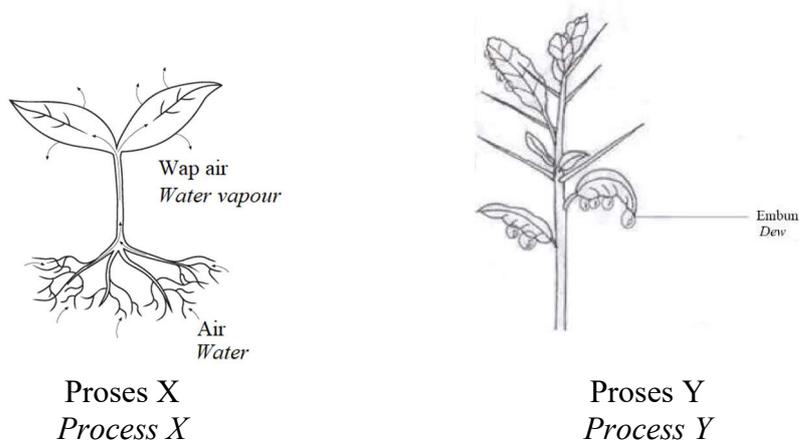
Rajah 16
Diagram 16

Dengan mengandaikan semua keadaan lain adalah sama untuk ketiga-tiga tanaman. Tumbuhan manakah yang kemungkinan akan menjalankan fotosintesis paling lambat, dan yang mana yang paling cepat?

Assuming all other conditions were identical for all three plants. Which of the plants would be likely to photosynthesize slowest, and which fastest?

- A X paling lambat, Y paling cepat
X slowest, Y fastest
- B Y paling lambat, Z paling cepat
Y slowest, Z fastest
- C Z paling lambat, Y paling cepat
Z slowest, Y fastest
- D Z paling lambat, X paling cepat
Z slowest, X fastest
- 25 Antara yang berikut, yang manakah menunjukkan kesan kekurangan nitrogen dalam tumbuhan?
Which of the following shows the effects of deficiency of nitrogen in plants?
- I Klorosis
Chlorosis
- II Daun bercuping
Lobed leaves
- III Bintik merah pada daun
Red spots on leaves
- IV Pertumbuhan terbantut
Stunted growth
- A I dan II sahaja
I and II only
- B II dan III sahaja
II and III only
- C III dan IV sahaja
III and IV only
- D I dan IV sahaja
I and IV only

- 26 Rajah 17 menunjukkan proses X dan proses Y yang merupakan dua proses penting berlaku pada tumbuhan untuk menyingkir air yang berlebihan.
Diagram 17 shows process X and process Y are the two important process occurs in plant to remove excess water.



Rajah 17
 Diagram 17

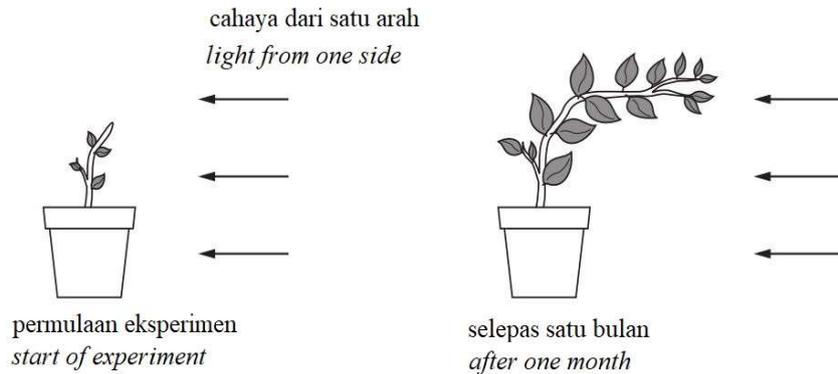
Antara yang berikut, yang manakah menunjukkan perbezaan antara process X dan process Y?

Which of the following shows the difference between process X and process Y?

	Proses X <i>Process X</i>	Proses Y <i>Process Y</i>
A	berlaku pada siang hari <i>happens during the day</i>	berlaku pada waktu malam <i>happens at night</i>
B	berlaku dalam keadaan lembap <i>happens in wet condition</i>	berlaku dalam keadaan kering <i>happens in dry condition</i>
C	melibatkan sap xylem <i>involves xylem sap</i>	melibatkan wap air <i>involves water vapour</i>
D	tidak menyebabkan kelayuan tumbuhan <i>does not cause wilting of plants</i>	menyebabkan kelayuan tumbuhan <i>causes wilting of plants</i>

- 27 Rajah 18 menunjukkan tumbuhan pada permulaan eksperimen, dan tumbuhan yang sama selepas satu bulan.

The diagram 18 show a plant at the start of an experiment, and the same plant one month later.

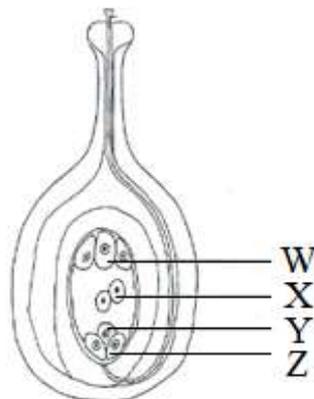


Rajah 18
Diagram 18

Ciri-ciri organisma hidup manakah yang ditunjukkan oleh eksperimen ini?

Which characteristics of living organisms are demonstrated by this experiment?

- A perkumuhan, pertumbuhan, pergerakan
excretion, growth, movement
 - B perkumuhan, pergerakan, pembiakan
excretion, movement, reproduction
 - C pertumbuhan, pergerakan, gerak balas
growth, movement, response
 - D gerak balas, pertumbuhan, respirasi
responding, growth, respiration
- 28 Rajah 19 menunjukkan keratan rentas karpel bagi suatu tumbuhan.
Diagram 19 shows a cross section of a carpel of a plant.



Rajah 19
Diagram 19

Antara sel berlabel W, X, Y dan Z yang manakah akan disenyawakan oleh gamet jantan untuk membentuk embrio yang diploid?

Which cell labelled W, X, Y or Z will be fertilized by the male gamete to form a diploid embryo?

- A W
- B X
- C Y
- D Z

- 29 Antara bahagian biji benih yang sedang bercambah berikut, yang manakah mempunyai konstitusi genetik yang sama dengan tisu induk maternalnya?
Which of the following part of a germinating seed has the same genetic constituent as the tissue of the maternal parent?

- A testa
testa
B kotiledon
cotyledon
C endosperma
endosperm
D plumul
plumule

- 30 Antara berikut, pengelasan tumbuhan berdasarkan habitatnya adalah benar kecuali
The following classification of plants based on their habitats are correct except

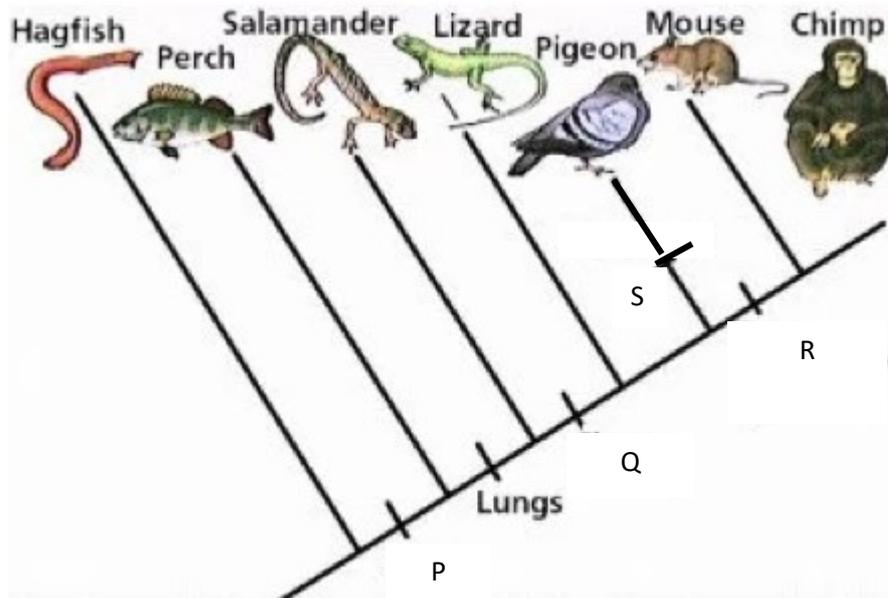
	Jenis Type	Contoh Tumbuhan Example of plants
A	Mesofit <i>Mesophytes</i>	Pokok keembung, pokok getah <i>Balsam plant, rubber tree</i>
B	Halofit <i>Halophytes</i>	Avicennia, Pandan <i>Avicennia, Pandanus</i>
C	Xerofit <i>Xerophytes</i>	Pokok bunga raya, paku pakis <i>Hibiscus plant, fern</i>
D	Hidrofit <i>Hydrophytes</i>	Kiambang, Teratai <i>Duckweed, lotus</i>

- 31 Antara berikut, yang manakah tergolong dalam alam yang berdinding sel dan bersifat heterotrofik sepenuhnya?

- Members of which kingdoms possess cell walls and are all heterotrophic?*
A Plantae
Plantae
B Fungi
Fungi
C Protista
Protista
D Eubacteria
Eubacteria

32 Rajah 20 menunjukkan pokok filogeni sebilangan haiwan vertebrata. Titik P, Q, R dan S mewakili ciri sepunya daripada suatu leluhur.

Diagram 20 shows the phylogenetic tree of some vertebrates. Points P, Q, R and S represent the common characteristics from an ancestor.



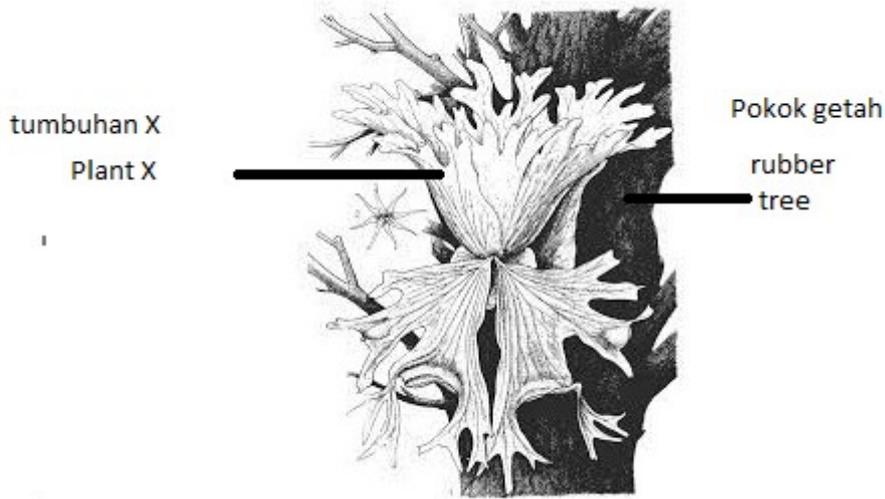
Rajah 20
Diagram 20

Antara berikut, yang manakah paling tepat mewakili ciri sepunya tersebut?

Which of the following best represent the common characteristics?

	P	Q	R	S
A	Rahang <i>Jaw</i>	Bulu pelepah <i>Feathers</i>	Telur beramnion <i>Amniotic egg</i>	Kelenjar susu <i>Mammary gland</i>
B	Telur beramnion <i>Amniotic egg</i>	Kelenjar susu <i>Mammary gland</i>	Rahang <i>Jaw</i>	Bulu pelepah <i>Feathers</i>
C	Rahang <i>Jaw</i>	Telur beramnion <i>Amniotic egg</i>	Kelenjar susu <i>Mammary gland</i>	Bulu pelepah <i>Feathers</i>
D	Bulu pelepah <i>Feathers</i>	Telur beramnion <i>Amniotic egg</i>	Rahang <i>Jaw</i>	Kelenjar susu <i>Mammary gland</i>

- 33 Rajah 21 menunjukkan satu interaksi antara tumbuhan X dan pokok getah.
 Diagram 21 shows an interaction between plant X and a rubber tree.



Rajah 21

Diagram 21

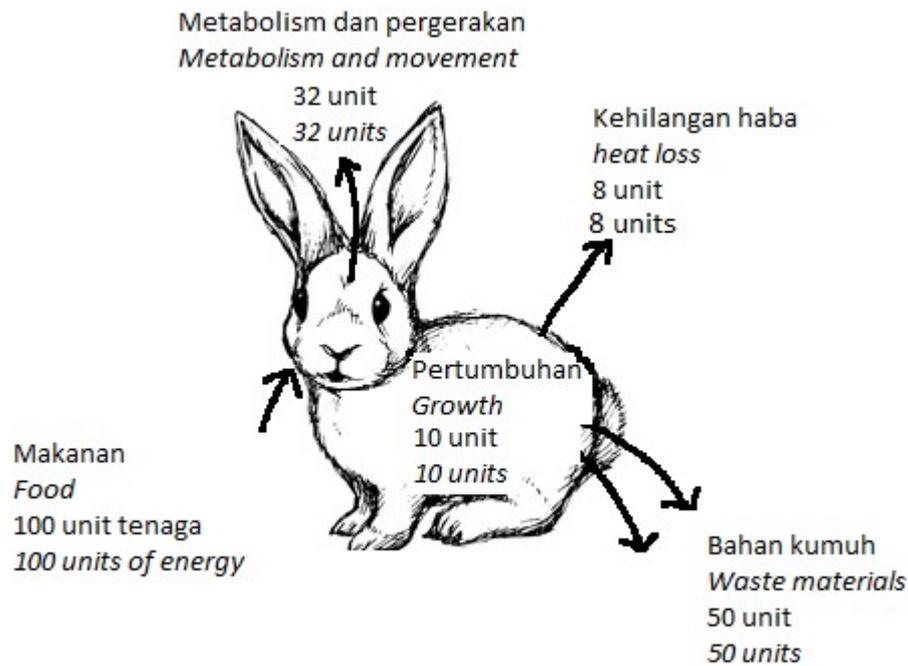
Antara pasangan organisma manakah yang menunjukkan interaksi yang sama seperti ditunjukkan oleh Rajah

Which pair of organisms shows the same type of interaction as shown in the Diagram.

- A Kutu dan kucing
Flea and cat
- B Ikan jerung dan ikan remora
Shark and remora fish
- C Alga dan kulat
Algae and fungi
- D Ikan badut dan buran
Clown fish and sea anemone

- 34 Rajah 22 menunjukkan bagaimana tenaga daripada makanan digunakan oleh sejenis haiwan.

Diagram 22 shows how energy from food is used by an animal.



Rajah 22

Diagram 22

Apakah peratus tenaga yang boleh diguna oleh consumer dan pengurai?

What percentage of this energy is available to consumers and decomposers?

- A 90
 B 50
 C 40
 D 10
- 35 Antara berikut, yang manakah benar berkaitan dengan kesan rumah hijau?
Which of the following is true regarding the greenhouse effect?
- A Eutrophikasi
Eutrophication
 B Banjir kilat
Flash floods
 C Pemanasan global
Global warming
 D Pencemaran terma
Thermal pollution

36 Penebangan pokok secara besar-besaran akan menyebabkan pengurangan taburan hujan.

Cutting down large areas of tropical forest can lead to a reduction in rainfall.

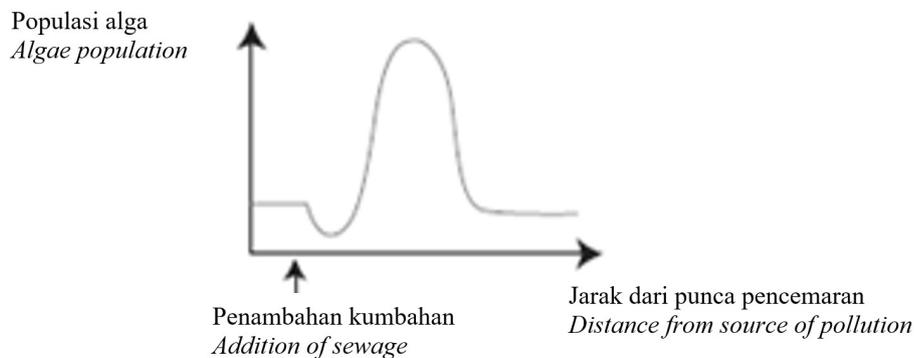
Apakah sebab pengurangan taburan hujan berlaku?

What is the reason for the reduction in rainfall?

- A Pengurangan photosynthesis
A reduction in photosynthesis
- B Pengurangan respirasi
A reduction in respiration
- C Pengurangan transpirasi
A reduction in transpiration
- D Pertambahan carbon dioksida
An increase in carbon dioxide

37 Antara berikut, pernyataan yang manakah benar berdasarkan graf 1 di bawah?

Among the statements below, which one is true based on the graph 1 below?



Graf 1

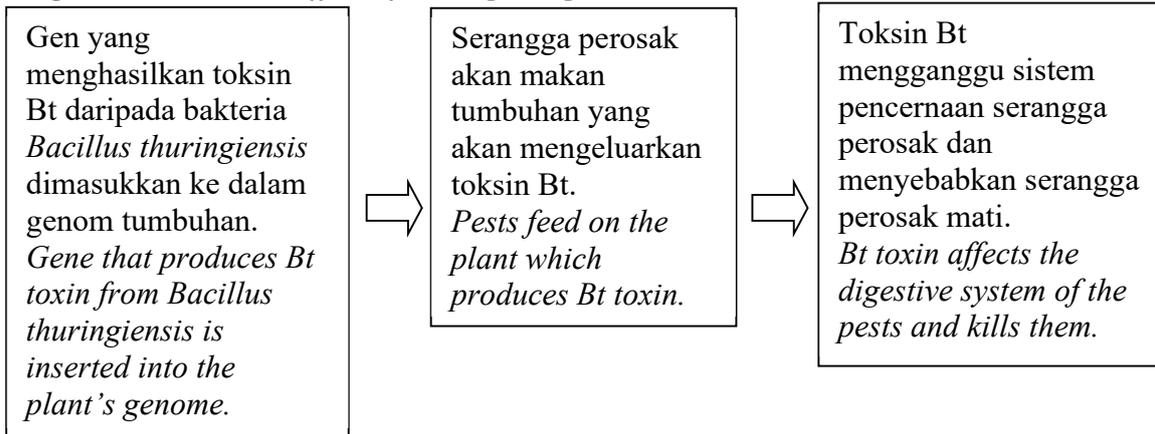
Graph 1

- I Eutrofikasi berlaku
Eutrophication occurs
 - II Kandungan oksigen dalam air semakin bertambah
The level of oxygen in the water increases
 - III Mengakibatkan kematian haiwan-haiwan akuatik
Death of aquatic animals
 - IV Diversiti hidupan akuatik bertambah
Diversity of organisms increases
- A I dan II
I and II
 - B I dan III
I and III
 - C II dan IV
II and IV
 - D III dan IV
III and IV

- 38 Alel untuk bunga merah dan bunga putih bagi suatu tumbuhan adalah kodominan. Alel heterozigot menunjukkan bunga merah jambu. Apakah nisbah fenotipnya bagi anak jika dua tumbuhan berbunga merah jambu dikacukkan?
The allele for red flowers and the allele for white flowers in a plant show codominance. The heterozygote shows pink colour. What is the phenotypic ratio of the offspring from a cross between heterozygous pink-flowered plants?
- A 1 merah : 1 putih
1 red : 1 white
- B 1 merah : 1 merah jambu : 1 putih
1 red : 1 pink : 1 white
- C 1 merah : 2 merah jambu : 1 putih
1 red : 2 pink : 1 white
- D 1 putih : 3 merah
1 white : 3 red
- 39 Jika suatu organisma mempunyai nombor diploid $2n = 8$, berapakah jenis gamet yang berbeza dari segi gabungan kromosom yang mungkin dihasilkan semasa penyusunan kromosom homolog secara rawak?
If an organism has a diploid number of $2n = 8$, how many possible combinations of gametes can be formed during independent assortment of homologous chromosomes?
- A 4
- B 8
- C 16
- D 32

40 Rajah 23 menunjukkan kesan tumbuhan Bt ke atas serangga perosak.

Diagram 23 shows the effect of Bt crops on pest.



Rajah 23
Diagram 23

Sekiranya petani menanam tumbuhan Bt dalam jangka masa yang panjang, apakah kesan utama terhadap ekosistem?

If farmers plant Bt crops for a long period of time, what is the major effect to the ecosystem?

- A Tumbuhan Bt boleh memusnahkan serangga lain dan mengganggu jaringan makanan.
Bt crops may destroy other types of insects and disrupt food web.
- B Tumbuhan Bt boleh menyebabkan ancaman kepada kesihatan manusia.
Bt crops may cause harm to human's health.
- C Tumbuhan Bt boleh menyebabkan ketidakseimbangan bentuk iklim.
Bt crops may cause imbalance in climate pattern.
- D Tumbuhan Bt boleh menyebabkan tumbuhan biasa mengalami kepupusan.
Bt crops may cause natural crops to become extinct.

SKEMA JAWAPAN
PRAKTIS BIOLOGI 4551/1
SET 3

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

LAMPIRAN

(Untuk rujukan guru)

SAMPEL JADUAL SPESIFIKASI UJIAN (JSU)

- PRAKTIS BIOLOGI 4551/1: SET 3

Chapter	Sub-Chapter	Remembering (PB01)			Understanding (KB01)			Applying (KB02)			Analyzing (KB03)			HOTS	Total
		E	M	H	E	M	H	E	M	H	E	M	H		
FORM 4															
6.0 Cell Division	6.1 Cell Division					5								/	1
	6.2 Cell Cycle and Mitosis														0
	6.3 Meiosis														0
	6.4 Issues of Cell Division on Human Health														0
7.0 Cellular Respiration	7.1 Energy Production through Cellular Respiration														0
	7.2 Aerobic Respiration	6													1
	7.3 Fermentation														0
8.0 Respiratory System in Humans and Animals	8.1 Types of Respiratory System														0
	8.2 Mechanisms of Breathing					7									1
	8.3 Gaseous Exchange in Humans														0
	8.4 Health Issues Related to the Human Respiratory System														0
9.0 Nutrition and Human Digestive System	9.1 Digestive System														0
	9.2 Digestion														0
	9.3 Absorption						8							/	1
	9.4 Assimilation														0
	9.5 Defaecation														0
	9.6 Balanced Diet														0
	9.7 Health Issues Related to the Digestive System and Eating Habits														0
10.0 Transport in Humans	10.1 Types of Circulatory System									9				/	1
	10.2 Circulatory System of Humans														0
	10.3 Mechanism of Heart Beat														0
	10.4 Mechanism of Blood Clotting														0
	10.5 Blood Grouping in Humans														0
	10.6 Health Issues Related to the Human Circulatory System														0
	10.7 Lymphatic System of Humans					10								/	1
	10.8 Health Issues Related to the Human Lymphatic System														0

Chapter	Sub-Chapter	Remembering (PB01)			Understanding (KB01)			Applying (KB02)			Analyzing (KB03)			HOTS	Total
		E	M	H	E	M	H	E	M	H	E	M	H		
FORM 4															
11.0 Immunity in Human	11.1 Body Defence														0
	11.2 Actions of Antibodies														0
	11.3 Types of Immunity					11								/	1
	11.4 Health Issues Related to Immunity														0
12.0 Coordination and Response in Humans	12.1 Coordination and Response				12										1
	12.2 Nervous System														0
	12.3 Neurones and Synapse	13													1
	12.4 Voluntary and Involuntary Actions														0
	12.5 Health Issues Related to the Nervous System					14								/	1
13.0 Homeostasis and Human urinary System	13.1 Homeostasis		15												1
	13.2 Urinary System														0
	13.3 Health Issues Related to Urinary System														0
14.0 Support and Movements in Humans and Animals	14.1 Types of Skeleton														0
	14.2 Musculoskeletal System of Humans							16						/	1
	14.3 Movement and Locomotion	17													1
	14.4 Health Issues Related to the Human Musculoskeletal System														0
15.0 Sexual Reproduction, Development and Growth in Humans and Animals	15.1 Reproductive System of Humans														0
	15.2 Gametogenesis in Humans														0
	15.3 Menstrual Cycle														0
	15.4 Development of Human Foetus		18												1
	15.5 Formation of Twins														0
	15.6 Health Issues Related to the Human Reproductive System						19							/	1
	15.7 Growth in Humans and Animals														0

Chapter	Sub-Chapter	Remembering (PB01)			Understanding (KB01)			Applying (KB02)			Analyzing (KB03)			HOTS	Total
		E	M	H	E	M	H	E	M	H	E	M	H		
FORM 5															
1.0 Structure of Plants and Growth	1.1 Organisation of Plant Tissues	20													1
	1.2 Meristematic Tissues and Growth					21								/	1
	1.3 Growth Curves														0
2.0 Structure of Leaves and Function	2.1 Structure of a Leaf														0
	2.2 Main Organ for Gaseous Exchange				22										1
	2.3 Main Organ for Transpiration					23									1
	2.4 Main Organ for Photosynthesis														0
	2.5 Compensation Point								24					/	1
3.0 Nutrition of Minerals in Plants	3.1 Main Inorganic Nutrients				25										1
	3.2 Organ for Water and Mineral Salts Uptake														0
	3.3 Diversity in Plant Nutrition														0
4.0 Transport in Plants	4.1 Vascular Tissues														0
	4.2 Transport of Water and Mineral Salts										26			/	1
	4.3 Translocation														0
	4.4 Phytoremediation														0
5.0 Response in Plants	5.1 Types of Responses														0
	5.2 Phytohormone														0
	5.3 Application of Phytohormones in Agriculture			27										/	1
6.0 Sexual Reproduction in Flowering Plant	6.1 Structure of a Flower														0
	6.2 Development of Pollen Grains and Embryo Sac		28												1
	6.3 Pollination and Fertilisation				29										1
	6.4 Development of Seeds and Fruits														0
	6.5 Importance of Seeds for Survival														0
7.0 Adaption of Plants in Different Habitats	7.1 Adaptations of Plants		30												1

Chapter	Sub-Chapter	Remembering (PB01)			Understanding (KB01)			Applying (KB02)			Analyzing (KB03)			HOTS	Total
		E	M	H	E	E	M	H	E	E	M	H	E		
FORM 5															
8.0 Biodiversity	8.1 Classification System and Naming of Organisms	31													1
	8.2 Biodiversity				32										1
	8.3 Microorganisms and Viruses														0
9.0 Ecosystem	9.1 Community and Ecosystem							33						/	1
	9.2 Population Ecology									34				/	1
10.0 Environmental Sustainability	10.1 Threats to the Environment	35													1
	10.2 Preservation, Conservation and Restoration of Ecosystems														0
	10.3 Practices in Environmental Sustainability					36								/	1
	10.4 Green Technology									37				/	1
11.0 Inheritance	11.1 Monohybrid Inheritance														0
	11.2 Dihybrid Inheritance														0
	11.3 Genes and Alleles														0
	11.4 Inheritance in Humans								38					/	1
12.0 Variation	12.1 Types and Factors of Variation														0
	12.2 Variation in Humans														0
	12.3 Mutation						39							/	1
13.0 Genetic engineering	13.1 Genetic Engineering											40		/	1
	13.2 Biotechnology														0
ANALYSIS	TOTAL (LEVEL OF DIFFICULTY)	9	4	2	6	6	3	4	1	3	1	1	0	20	40
	TOTAL (ELEMENT)	15			15			8			2				
	PERCENTAGE (ELEMENT)	37.50			37.50			20.00			5.00				
Ratio of E:M:H	5:3:2 (SPM FORMAT)														
Level of Difficulty	E : Easy M : Medium H : Hard														
EASY	20														
MEDIUM	12														
HARD	8														
GCD	4														
RATIO OF E:M:H	5:3:2														