BUKU RAMALAN SPM TERBAIK!

PASTI SKOR .COM.MY

BIOLOGI

Hi! Selamat Datang Ke PastiSkor

1. Buku ini disediakan melalui analisis soalan-soalan SPM sebenar, soalan-soalan percubaan SPM 2025 dan input guru yang berwibawa.

   Hanya soalan-soalan yang penting, mungkin berulang dan mempunyai peluang yang tinggi untuk keluar dalam SPM disediakan dalam buku ini.

2. Buku ini mengandungi **Ramalan SPM 2025**, **Analisis Kertas Percubaan SPM 2025 dan Tiga(3) set soalan kertas 2** dengan **jawapan lengkap**.

3. Cara menggunakan buku ini :

Langkah 1

Beri tumpuan pada topik-topik ramalan yang disertakan dalam buku ini.

Langkah 2

Sila jawab semua soalan dan semak jawapan anda dengan skema pemarkahan yang disertakan.

Semoga Berjaya
Daripada Semua Tenaga Pengajar Di Pastiskor!!

RAMALAN BIOLOGI KERTAS 2 SPM 2025

BAB	TINGKATAN 4
4 : Komposisi Kimia dalam Sel	4.3 Protein (ms 76) 4.5 Asid Nukleik (ms 79)
5 : Metabolisme dan Enzim	5.2 Enzim (ms 86) 5.3 Aplikasi enzim dalam kehidupan harian (ms 95)
6 : Pembahagian Sel	6.2 Kitar sel dan mitosis (ms 101) 6.3 Meiosis (ms 105)
7 : Respirasi Sel	7.3 Fermentasi ● yis
9 : Nutrisi dan Sistem Pencernaan Manusia	9.1 Sistem pencernaan (ms 144) 9.7 Isu kesihatan berkaitan sistem pencernaan dan tabiat pemakanan (ms 161)
11 : Keimunan Manusia	11.1 Pertahanan badan (ms 200) 11.3 Jenis Keimunan (ms 205) ● perbandingan antara dua jenis keimunan
12 : Koordinasi dan Gerak Balas dalam Manusia	12.2 Sistem saraf (ms 220) 12.3 Neuron dan Sinaps (ms 223) 12.4 Tindakan terkawal dan tindakan luar kawal (ms 226) ● refleks
14 : Sokongan dan Pergerakan dalam Manusia dan Haiwan	14.2 Sistem otot rangka manusia (ms 267) 14.3 Mekanisme pergerakan dan gerak alih ● sendi ● gerak alih haiwan
15 : Pembiakan Seks, Perkembangan dan Pertumbuhan dalam Manusia dan Haiwan	15.2 Gametogenesis Manusia (ms 288) ● spermatogenesis 15.3 Kitar Haid (ms 293) 15.6 Isu kesihatan berkaitan sistem pembiakan manusia (ms 302)

RAMALAN BIOLOGI KERTAS 2 SPM 2025

BAB	TINGKATAN 5
2 : Struktur Daun	2.1 Struktur daun (ms 28) 2.5 Titik pampasan (ms 52)
4 : Pengangkutan dalam Tumbuhan	4.1 Tisu vaskular (ms 76) 4.2 Pengangkutan air dan garam mineral (ms 79) ● Xilem dan floem 4.3 Translokasi (ms 86)
5 : Gerak Balas dalam Tumbuhan	5.1 Jenis gerak balas (ms 98) 5.2 Fitohormon (ms 103)
7 : Penyesuaian Tumbuhan Berdasarkan Habitat	7.1 Penyesuaian tumbuhan berdasarkan habitat ● penyesuaian nutrisi
6 : Pembiakan Seks dalam Tumbuhan Berbunga	6.1 Struktur bunga (ms 114) ● struktur bunga biseks 6.2 Pembentukan debunga dan pundi embryo (ms 116) 6.3 Pendebungaan dan persenyawaan (ms 120)
8: Biodiversiti	8.1 Sistem pengelasan dan penamaan organisma (ms 144) ● parasitisme 8.2 Biodiversiti (ms 152) 8.3 Mikroorganisma dan Virus
9 : Ekosistem	9.1 Komuniti dan ekosistem (ms 170) ● rantai makanan
10 : Kelestarian Alam Sekitar	10.1 Ancaman alam sekitar (ms 202) 10.4 Teknologi hijau (ms 218)
11 : Pewarisan	11.1 Pewarisan monohibrid (ms 230) 11.4 Pewarisan manusia (ms 242) ● faktor Rhesus
12 : Variasi	12.3 Mutasi (ms 269) ● mutasi genetik
13 : Teknologi Genetik	13.1 Kejuruteraan genetik (ms 280) ● bahan makanan terubah suai genetik

ANALISIS BIOLOGI PERCUBAAN KERTAS 2 SPM 2025

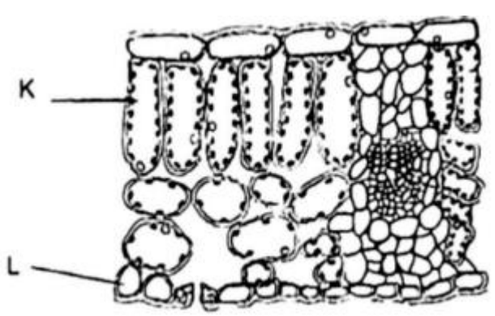
	1	2	3	4	5	6	7	8	9	10	11
Johor	T5B2 Cross section of leaf Photosynthesis	T4B3 Structure of plasma membrane	T5B1 Growth curve of plants Determining age of plants based on rings	T4B10 Structure and function of heart	T5B8/7 Classification of plants Adaptation of plants	T4B12 Coordination and response Knee-jerk test	T4B5/9 Extracellular enzymes Digestion	T4B15 Menstrual cycle Birth control	T4B7 Cellular respiration	T5B12 Genetic disorders	T5B10 Practices in environmental sustainability
Selangor	T4B2 Cell structure and function	T4B7/T5B7 Breakdown of glucose Adaptation of plants	T5B1/7/8 Growth curve Classification Adaptation of plants	T4B9 Breakdown of protein in digestive system Assimilation	T5B8 Classification system Nitrogen cycle	T4B10 Lymphatic system	T5B2 Leaf lamina Stoma Transpiration	T5B11/12 Inheritance in humans Genetic disorders	T4B12 Neurons and synapse	T4B6/15 Issues of cell division Menstrual cycle Issues of reproductive system	T5B10/9 Environmental sustainability Preservation of ecosystem Population ecology
Kedah	T4B9 Digestive system Defaecation	T4B5 Enzymes	T5B2 Photosynthesis Compensation point	T4B7 Aerobic respiration Fermentation	T5B8 Classification system Microorganisms and viruses	T4B12 Coordination and response Neurons and synapse	T5B11 Genes and Alleles	T4B15 Menstrual cycle Foetus formation Health issues related to reproductive system	T4B10 Circulatory system Lymphatic system	T5B3/8 Nutrition in plants Nitrogen cycle	T5B9/13 Population ecology Genetic engineering
N9	T4B2 Cell structure and function	T4B8 Respiratory systems in animals	T5B4 Phytoremediation	T4B10 Blood vessels	T4B4 Protein synthesis	T5B9 Mangrove swamps	T4B13 Nephrons Urinary system	T4B15 Menstrual cycle	T4B12 Involuntary response Hormonal imbalance	T5B11 Genes and Alleles	T5B3/10 Nutrition in plants Environmental sustainability
Pahang	T4B2 Cell structure and function	T4B3 Movement of substances across a plasma membrane	T4B5 Enzymes	T4B12 Nervous system	T5B2 Leaf lamina Photosynthesis Compensation point	T4B8 Respiratory systems	T5B8/9 Adaptations of plants Mangrove swamps	T4B6 Cell cycle Cancer cells	T5B11 Genes and Alleles	T4B15 Menstrual cycle Contraceptives Comparison of twins	T5B10 Food security Environmental sustainability
T'ganu	T4B4 Nucleic acid	T5B8 Classification system	T4B11 Body defence Immunity	T5B8 Adaptations of plants	T4B12 Neurons Involuntary response	T4B15 Menstrual cycle Twin formation	T4B14 Bones and joints Changes of posture	T5B11/12 Genes and Alleles Variation Mutation	T4B6 Cell division Issues with cell division	T4B5 Metabolism reactions in plants	T5B13 Genetic engineering GMF
Kelantan	T4B5 Enzymes	T4B6 Cell division	T5B6 Development of seeds and fruits	T5B8 Nitrogen cycle	T5B8/10 Classification system Conservation of ecosystem	T4B13 Homeostasis	T5B6/10 Pollination and fertilisation Environmental sustainability	T5B11 Genes and Alleles	T4B12 Coordination and response	T5B9 Mangrove swamps	T4B15 Menstrual cycle IVF Twin formation Infertility issues

BIOLOGI KERTAS 2
SET 1 BAHAGIAN A

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

1. (a) Rajah 1 menunjukkan keratan rentas daun.

(a) Diagram 1 shows a cross section of leaf.



Rajah 1/ *Diagram 1*

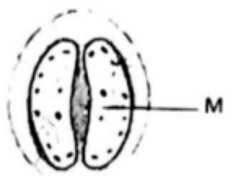
(i) Namakan struktur berlabel K dan L
Name the structures labelled as K and L.

(ii) Nyatakan satu penyelesaian struktur K untuk meningkatkan kadar fotosintesis.
State one adaptation of structure K to increase the rate of photosynthesis.

[2 markah / 2 mark]

(b) Rajah 1.1 menunjukkan keadaan sel M dalam tumbuhan yang layu.

Diagram 1.1 shows the condition of cell M in a wilted plant.



Rajah 1.1 / *Diagram 1.1*

(i) Berdasarkan rajah di atas, nyatakan keadaan sel M.

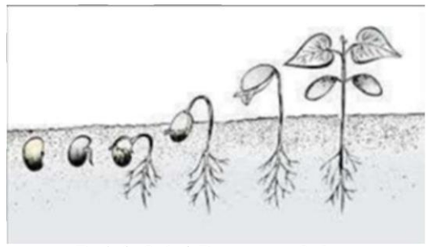
Based on the diagram above, state the condition of cell M.

[1 markah / 1 mark]

(ii) Terangkan kepentingan stoma pada daun tertutup ketika cuaca panas melampau.
Explain the importance of stomatal closure during an extremely hot day.

[2 markah / 2 marks]

2. Rajah 2.1 menunjukkan pertumbuhan satu anak benih
Diagram 2.1 shows the growth of one seedling.



Rajah 2.1 / *Diagram 2.1*

a. (i) Berdasarkan Rajah 2.1 nyatakan satu jenis tisu tumbuhan yang bertanggungjawab dalam pertumbuhan.
Based on Diagram 2.1, state one type of plant tissue that is responsible for growth.

_____

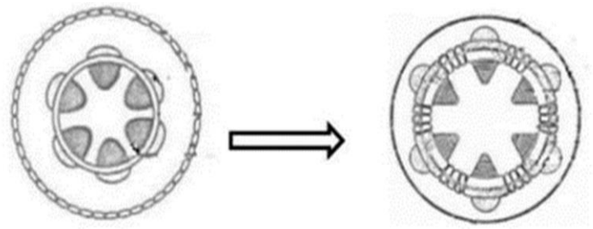
[1 markah / 1 mark]

(ii) Nyatakan jenis pembahagian sel yang menyumbang kepada proses yang ditunjukkan pada Rajah 2.1.
State the type of cell division that contributes to the process shown in Diagram 2.1.

_____

[1 markah / 1 mark]

b. Rajah 2.2 (a) dan Rajah 2.2 (b) menunjukan pertumbuhan sekunder yang berlakupada batang tumbuhan eudikot.
Diagram 2.2 (a) and Diagram 2.2. (b) show the secondary growth that occurs at the stem of the eudicots plant.



Rajah 2.2 (a) / *Diagram 2.2(a)* Rajah 2.2 (b) / *Diagram 2.2(b)*

Berdasarkan Rajah 2.2 (a) dan Rajah 2.2 (b) nyatakan **dua** bahagian tisu yang terlibat dalam pertumbuhan sekunder.
*Based on Diagram 2.2 (a) and Diagram 2.2 (b), state **two** parts of tissue that are involved in secondary growth.*

i: _____

ii: _____

[2 markah / 2 marks]

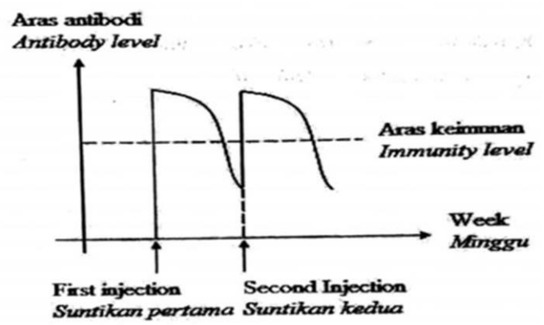
Terangkan satu kepentingan pertumbuhan sekunder kepada tumbuhan eudikot.
Explain one importance of secondary growth to eudicots plants.

_____

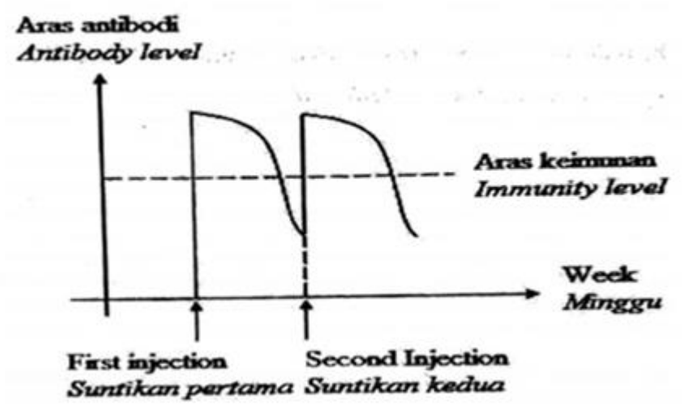
_____

_____

[2 markah / 2 marks]



3. Rajah 3 menunjukkan graf aras keimunan manusia.
Diagram 3 shows a graph of the levels of immunity in humans.



Rajah 3 / *Diagram 3*

Berdasarkan Rajah 3:
Based on Diagram 3:

(a) (i) Apakah yang dimaksudkan dengan keimunan?
What is meant by immunity?

_____

_____

[1 markah / 1 mark]

(ii) Nyatakan jenis keimunan yang ditunjukkan dalam Rajah 3.
State the type of immunity shown in Diagram 3.

_____

_____

[1 markah / 1 mark]

(b) Terangkan mengapakah suntikan kedua diperlukan selepas suntikan pertama.
Explain why a second injection is needed after the first injection.

_____

_____

_____

[2 markah / 2 marks]

(c) Seorang yang dipatuk ular berbisa diberi suntikan antiserum unuk merawatnya. Berdasarkan konsep suntikan dalam graf, terangkan bagaimanakan suntikan antiserum dapat menyembuhkan pesakit itu.

A person who is bitten by a venomous snake is given an injection of antiserum to treat it. Based on the concept of injection in the graph, explain how an injection of antiserum can cure the patient.

_____

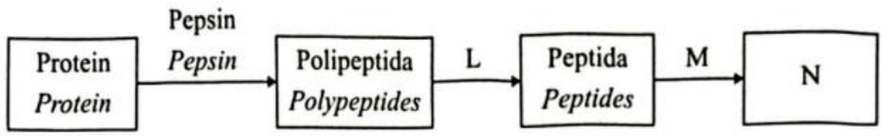
_____

_____

_____

[3 markah / 3 marks]

4. Rajah 4 menunjukkan tindak balas penguraian protein di dalam sistem pencernaan manusia.
Diagram 4 shows a breakdown reaction of protein in human digestive system.



Rajah 4 / *Diagram 4*

(a) Berdasarkan Rajah 4, apakah yang diwakili oleh N?
Based on Diagram 4, what is represented by N?

_____

[1 markah / *1 mark*]

(b) L dan M merupakan enzim yang dirembeskan oleh organ berbeza. Namakan organ yang merembeskan enzim L dan M.
L and M are enzymes secreted by different organs. Name the organ that secretes enzymes L and M,

L	M

[2 markah / 2 marks]

(c) Terangkan kepentingan N kepada individu yang baru menjalani pembedahan disebabkan oleh kemalangan.
Explain the importance of N to an individual who has just completed an operation due to an accident.

_____

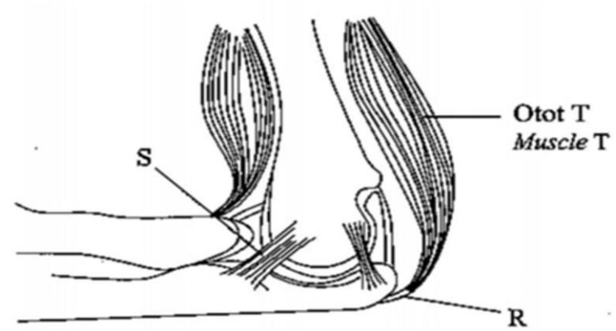
_____

(d) Terangkan proses asimilasi yang berlaku sekiranya N adalah berlebihan di dalam darah.

Explain the assimilation process that occurs if N is excessive in the blood.

[2 markah / 2 marks]

5. Rajah 5.1 menunjukkan bahagian pada sendi siku.
Diagram 5.1 shows a apart of elbow joint.



Rajah 5.1 / *Diagram 5.1*

(a) (i) Namakan otot T.
Name muscle T.

_____

[1 markah / 1 mark]

(ii) Nyatakan apa akan berlaku apabila otot **T** mengecut.
*State what happens when muscle **T** contracts.*

_____

_____

[1 markah / 1 mark]

(b) Nayatakan dua perbezaan antara tisu **R** dan tisu **S**.
State two differences between tissue R and tissue **S**.

Aspek *Aspect*	Tisu R *Tissue R*	Tisu S *Tissue S*
Ciri *Characteristics*		
Fungsi Function		

[2 markah / 2 marks]

(c) Dalam kemalangan, seorang remaja mengalami kecederaan pada tisu S. Apakah kesannya kepada pergerakan lengan remaja tersebut?
In an accident, a teenager suffered an injury to tissue S. What is the effect on the movement of the teenager's arm?

_____

_____

[2 markah / 2 marks]

(d) Rajah 5.2 menunjukkan sejenis rawatan pada sendi lutut seorang wanita yang berat badannya melebihi berat unggul.
Diagram 5.2 shows a type of treatment on the knee joint of a woman who is overweight.

Rajah 5.2 / *Diagram 5.2*

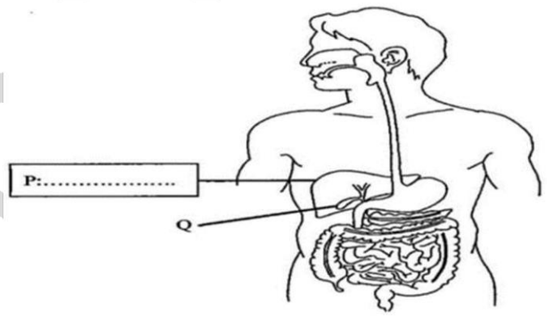
Mengapakah wanita tersebut diberkan rawatan sendi palsu?
Why is that woman given artificial joints treatment?

_____

_____

[2 markah / 2 marks]

6. Rajah 6.1 menunjukkan system pencernaan manusia.
Diagram 6.1 shows the human digestive system.



Rajah 6.1 / *Diagram 6.1*

(a) (i) Pada Rajah 6.1, labelkan **P.**
On Diagram 6.1, label P.

[1 markah / 1 mark]

(ii) Organ Q seorang dewasa telah dibuang. Terangkan kesan terhadap proses percernaan lipid.
Organ Q of an adult was surgically removed. Explain the effect to the digestion of lipids.

_____

_____

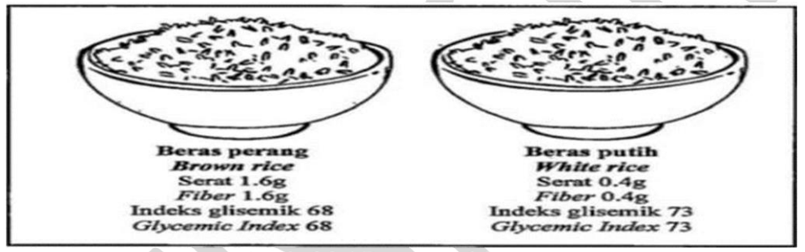
[2 markah / 2 marks]

(b) Doktor menyarankan kepada pesakit diabetes melitus untuk menukarkan pengambilan beras putih kepada beras perang dalam diet seharian. Rajah 6.2 menunjukkan maklumat pemakanan bagi 100g beras perang and beras putijh. Beras perang and beras putih mempunyai Indeks Glisemik yang berbesa.

Indeks Glisemik (IG) mengukur berapa cepat makanan yang mengandungi karbohidrat (seperti nasi) meningkatkan paras gula dalam darah seseorang selepas makanan tesebut dimakan.

Doctor recommends diabetes mellitus patient to replace white rice with brown rice in daily diet. Diagram 6.2 shows nutritional information for 100g of brown rice and white rice. Brown rice and white rice has different Glycaemic Index.

The Glycaemic Index (GI) measures how quick or slow a carbohydrate-containing food (ie. rice) raised blood glucose level after consumption.



Rajah 6.2 / *Diagram 6.2*

Terangkan mengapa doctor memberikan saranan tersebut.
Explain why the doctor give the recommendation.

_____

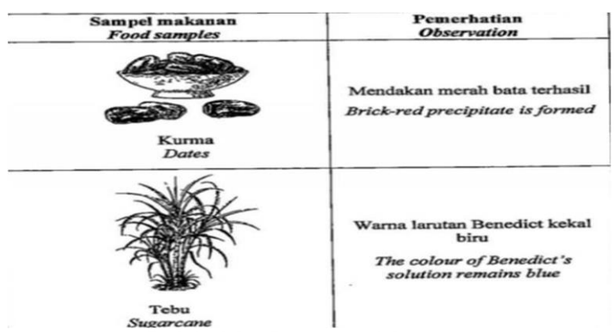
_____

_____

[3 markah / 3 marks]

(c) Sekumpulan pelajar menjalankan ujian Benedict untuk mengenalpasti jenis karbohidrat. Hasil ujian adalah seperti dalam Jadual 6.3

A group of students carried out Benedict's tests to determine type of carbohydrates. A result obtained as in Table 6.3.



Rajah 6.3 / *Diagram 6.3*

Terangkan mengapa pemerhatian ujian Benedict adalah berbeza seperti di dalam Jadual 6.1.
Explain why different observation of Benedict test is obtained as shown in Table 6.1.

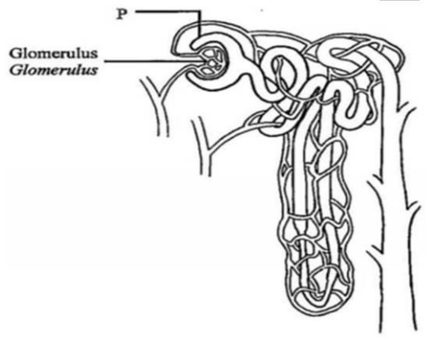
_____

_____

_____

[2 markah / 2 marks]

7. Rajah 7.1 menunjukkan struktur netron dalam ginjal manusia.
Diagram 7.1 shows the structure of nephron in the human kidney.



Rajah 7.1 / *Diagram 7.1*

(a) (i) Namakan struktur **P.**
Name structure P.

_____

[1 markah / 1 mark]

(ii) Nyatakan proses yang berlaku di antara glomerulus dan P.
State the process that occurs between glomerulus and P.

_____

[1 markah / 1 mark]

(b) Nyatakan **dua** perbezaan kandungan dalam glomerulus berbanding kandungan dalam P.
State two difference of content in glomerulus compared to the content in P.

Kandungan dalam glomerulus *Content in glomerulus*	**Kandungan dalam P** *Content in P*

[2 markah / 2 marks]

(c) Seorang individu mengalami kerosakan ginjal yang menyebabkan hematuria. Hematuria adalah keadaan Dimana darah dijumpai di dalam air kencing.

Terangkan mengapa keadaan ini berlaku.

An individual suffers damage in kidney that causing hematuria. Hematuria is a condition which blood can be found in urine.

Explain how this condition occurs.

_____

_____

_____

[2 markah / 2 marks]

(d) Rajah 7.2 menunjukkan dua jaket yang berbeza.
Diagram 7.2 shows two different jackets.

Rajah 7.2 / *Diagram 7.2*

Seorang saintis bercadang untuk melakukan ekspedisi ke Antarika bagi menjalankan penyelidikan biologi.
Pilih jacket yang paling sesuai untuk dipakai semasa ekspedisi tersebut.
Wajarkan jawapan anda.

A scientist plans to make an expedition to Antartic to carry out a biological research.
Choose the most suitable jacket to be worn during the expedition.
Justify your answer.

_____

_____

_____

_____

[3 markah / 3 marks]

8. Rajah 8.1 menerangkan aktiviti bakteria X.
Diagram 8.1 describes the activity of bacteria X.

> Memecahkan bahan organic kompleks seperti Najis haiwan, bangkai haiwan dan pokok reput kepada sebatian ringkas.
>
> Break down complex organic materials such as animal wastes, carcasses and rotting tress into simple compounds.

Rajah 8.1 / *Diagram 8.1*

(a) (i) Nyatakan nic bakteria X berdasarkan pernyataan di Rajah 8.1
State the niche of bacteria X based on statement in Diagram 8.1.

_____

[1 markah / 1 mark]

(ii) Ramalkan apa yang akan berlaku dalam persekitaran sekiranya bakteria X tiada.
Predict what happen to the environment if bacteria X is absent.

_____

_____

_____

[3 markah / 3 marks]

(b) Rajah 8.2 menunjukkan organisma Y yang dikelaskan dalam alam Fungi.
Diagram 8.2 shows organism Y which is classified into kingdom of Fungi.

Rajah 8.2 / *Diagram 8.2*

Nytatakan tiga persamaan antara organisma Y dengan bakteria X.
State three similarities between organism Y and backteria X.

_____

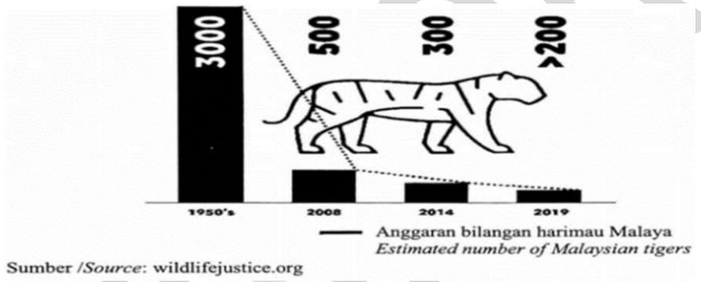
_____

_____

[3 markah / 3 marks]

(c) Rajah 8.3 menunjukkan populasi Panthera tigris jacksoni atau lebih dikenali sebagai harimau Malaya telah menurun secara drastik sebanyak lebih daripada 93% sepanjang 70 tahum yang lalu. Harimau Malaya kini dilindungi sepenuhnya di bawah Akta Pemuliharaan Hidupan Liar 2010, dan diklasifikasikan sebagai Terancam Secara Kriikal di bawah Senarai Merah International Union for Conservation of Nature (IUCN) untuk Spesies Terancam.

Diagram 8.3 shows Panthera tigris jacksoni or also known as the Malayan tiger has drastically decreased by more than 93% over the past 70 years. The Malayan tiger is totally Protected under the Wildlife Conservation Act 2010, and is classified as Critically Endangered under the International Union for Conservation of Nature (IUCN) Red List for Threatened Species.



Rajah 8.3 / *Diagram 8.3*

Usulkan hujah yang menyokong pemuliharaan secara ex situ bagi mengawal populasi harimau Malaya di Malaysia daripada kepupusan.

Propose arguments that support ex situ conservation to control the Malayan tiger population in Malaysia from extinction.

_____

_____

[2 markah / 2 marks]

BIOLOGI KERTAS 2
SET 1 BAHAGIAN B

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

9. (a) Jadual 1 menunjukkan kadar pernafasan seorang pelajar semasa berehat dan semasa melakukan aktiviti cergas.

Table 1 shows the breathing rate of a student during resting and during vigorous activity.

Kadar pernafasan (Pernafasan per minit) *Breathing rate (Breath per minute)*	 Semasa rehat *During resting*	 Semasa aktiviti cergas *During vigorous activity*
	16	30

Jadual 1 / *Table 1*

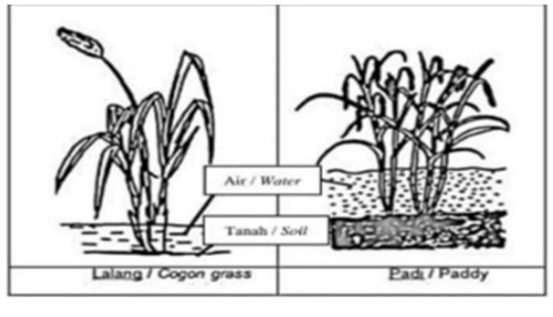
(i) Namakan proses respirasi yang berlaku sewaktu erhat dan semasa menjalankan aktiviti cergas.
Name the process happen during resting and during vigorous activity.

[2 markah / 2 marks]

(ii) Terangkan mengapa kadar pernafasan pelajar itu berbeza semasa berehat dan semasa aktiviti cergas.
Explain why the breathing rate of the student is different during resting and during vigorous activity.

[6 markah / 6 marks]

(b) Rajah 9.1 menunjukkan dua jenis tumbuhan di Kawasan sawah padi berair.
Diagram 9.1 shows two plants in waterlogged paddy field.



Rajah 9.1 / *Diagram 9.1*

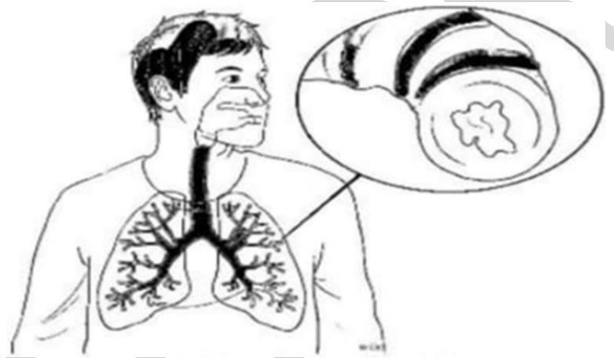
(i) Pokok padi mempunyai kemandirian yang lebih baik berbanding Lalang di kawasan air bertakung.
Terangkan mengapa.

Paddy plant can survive better compared to cogon grass in waterlogged area.
Explain why.

[6 markah / 6 marks]

(ii) Rajah 9.2 menunjukka salah satu daripada penyakit Chronic Obstructive Pulmonary Disease (COPD).

Diagram 9.2 shows one type of Chronic Obstructive Pulmonary Disease (COPD) disease.

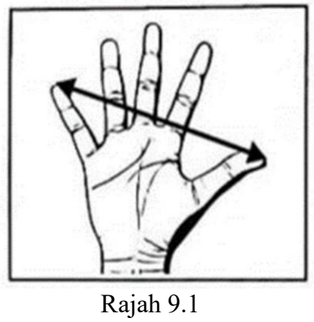


Rajah 9.2 / *Diagram 9.2*

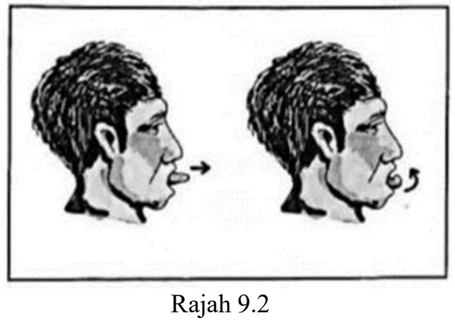
Terangkan mengapa pertukaran gas menjadi kurang efisien bagi pesakit yang menghidap penyakit emfisema.
Explain why the gaseous exchange becomes less efficient for an emphysema patient.

[6 markah / 6 marks]

10. (a) Rajah 9.1 dam Rajah 9.2 menunjukkan dua jenis variasi yang dikaji oleh murid tingkatan 5.
Diagram 9.1 and Diagram 9.2 shows two types of variation studied by form 5 students.



Rajah 9.1
Diagram 9.1



Rajah 9.2
Diagram 9.2

Jadual 1 menunjukkan hasil kajian tersebut.
Table 1 shows the results of the study.

Julat Panjang jengkal / cm *Ranges of hanspan / cm*	15 – 6	17 – 18	19 – 20	21 – 22	23 -24
Bilangan murid *Number of Students*	3	10	12	4	1

Ciri *Characteristic*	Kebolehan menggulung lidah *Ability to roll tongue*	
Bilangan murid *Number of Students*	20	10

Jadual 1
Table 1

(i) Nyatakan jenis variasi bagi Rajah 9.1 dan Rajah 9.2.
State the type of variation for Diagram 9.1 and Diagram 9.2.

[2 markah / 2 marks]

(ii) Terangkan perbezaan jenis graf yang diperoleh berdasarkan Jadual 1.
Explain the difference types of graphs obtained based on Table 1.

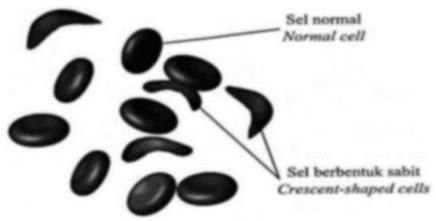
[2 markah / 2 marks]

(iii) Kebolehan menggulung lidah adalah ciri yang boleh diwariskan dair induk kepada anak.
Ability to roll tongue is a characteristic that can be inherited from parent to offspring.

Berdasarkan Hukum Mendel Pertama, Lukis rajah skema untuk menunjukkan pewarisan kebolehan menggulung lidah jika ayah and ibu adalah heterozigot.
Based on Mendel's First Law, draw a schematic diagram to show the inheritance ability to roll tonque if the father and the mother are heterozygote.

[2 markah / 2 marks]

(b) Rajah 9.3 menunjukkan suatu penyakit yang disebabkan oleh mutase dalam manusia.
Diagram 9.3 shows a type of disease that caused by mutation in human.



Rajah 9.3 / *Diagram 9.3*

Bincangkan tentang factor yang menyebabkan penyakit tersebut dan kesannya kepasa kesihatan individu.
Discuss about the factor that caused the disease and the effects on the health of individual.

[10 markah / 10 marks]

BIOLOGI KERTAS 2
SET 1 BAHAGIAN C

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

11. Pernyataan berikut merujuk kepada penggunaan kawalan biologi sebagai alternatif kepada kawalan secara kimia.

The following statement refers to application of biological control as an alternative to chemical control.

Agen kawalan biologi merupakan teknologi berkpnsepkan ekologi yang mengawal serangan serangga perosak sayuran tanah tinggi seperti kubis, salad dan tomato. Diadegma semiclausum (penyengat parasite), Cotesia vestalis (penyengat parasot) dan Coenosia exigua (langau) merupakan contoh agen kawalan biologi yang terbukti berkesan mengawal serangan serangga perosak.

Biological control agent is a technology based on ecological concepts that control pest attack on highland vegetables such as cabbages, lettuces and tomatoes. Diadegma semiclausum (parasite wasp), Cotesia vestalis (parasitic wasp) and Coenosia exigua (tiger fly) are some examples of biological control agents which have proven to be effective in controlling the attacks of pest.

(a) Terangkan bagaimana kawalan biologi berkesan mengawal serangan serangga perosak.
Explain how biological control is effective in controlling the attacks of pests.

[5 markah / 5 marks]

(b) Artikel akhbar berikut ialah tentang suatu Pembangunan yang tidak Lestari.

The following paper article is on unsustainable development.

Projek Bukit Fraser mungkin membawa kepada pembangunan tidak terancang
Fraser's Hill project may lead to unplanned development

Veena Babulal and T.N. Alagesh – Ogos /*August* 23, 2020 @ 1:00pm

KUALA LUMPUR: Ketua Persatuan Ekopelancongan dan Pemuliharaan Malaysia, Andrew J. Sebastian berkata, ancaman itu bukan hanya kepada kawasan pembangunan, tetapi lebih besar kepada Kompleks Hutan Bukit Fraser kerana melibatkan kawasan ekologi yang sensitif sejak awal lagi. Beliau berkata kompleks hutan itu, yang merangkumi enam hutan simpanan kekal, terancam akibat perubahan penggunaan tanah untuk pembalakan, perlombongan, pertanian dan infrastruktur, sebelum hotel bertingkat tinggi itu dimasukkan ke dalam perancangannya.

KUALA LUMPUR: Head of Ecotourism and Conservation Society Malaysia, Andrew J. Sebastian said the threat was not just to the area of the development, but the greater Fraser's Hill Forest Complex due to the precedent being set in the ecologically-sensitive area. He said the forest complex, which includes six permanent reserved forests, was under threat due to land use changes for logging, mining, agriculture and infrastructure, before the high-rise hotel was thrown into the mix.