

Answer **all** the questions

Jawab semua soalan

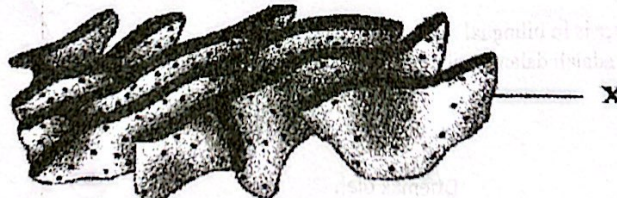
1. Apakah kaedah yang betul semasa menguruskan tumpahan merkuri?
What is the correct procedure to handle mercury spills?

- A Sekat tumpahan daripada merebak dengan menggunakan pasir.
Prevent the spill from spreading by using sand
- B Kaut tumpahan dengan menggunakan alat yang sesuai.
Scoop up the spill by using appropriate equipment.
- C Tabur serbuk sulfur untuk menutup tumpahan.
Sprinkle sulphur powder to cover the spill.
- D Buang ke tanah.
Dispose of it on the ground.

2. Apakah langkah yang betul selepas membina hipotesis?
What is the correct step after forming a hypothesis?

- A Mengumpul data
Collecting data
- B Mengenal pasti masalah
Identifying problems
- C Mengawal pembolehubah
Controlling variables
- D Merancang penyiasatan saintifik
Planning and carrying out a scientific investigation

3. Rajah 1 menunjukkan organel yang terdapat di dalam satu sel.
Diagram 1 shows organelle found in a cell.

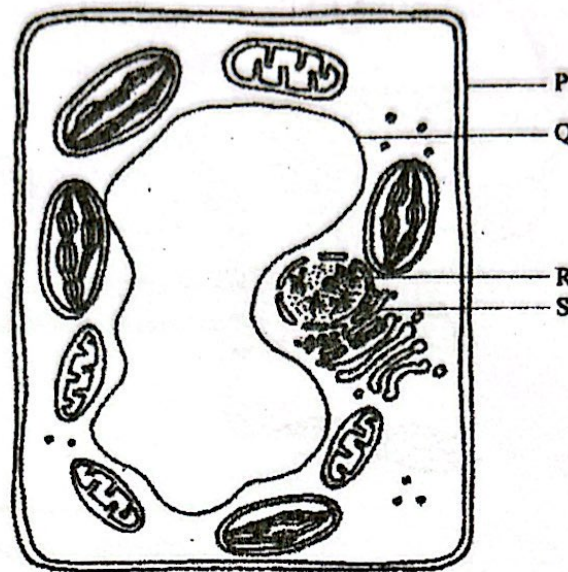


Rajah 1
Diagram 1

Apakah X?
What is X?

- | | |
|---|---|
| A Mitokondria
<i>Mitochondria</i> | C Jalinan endoplasma kasar
<i>Rough endoplasmic reticulum</i> |
| B Jasad golgi
<i>Golgi apparatus</i> | D Jalinan endoplasma licin
<i>Smooth endoplasmic reticulum</i> |

- 4 Rajah 2 menunjukkan struktur sel haiwan.
Diagram 2 shows structure of an animal cell.



Rajah 2
Diagram 2

Pilih padanan yang betul.
Choose the **correct** match.

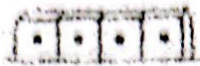
	Organel Organe II	Fungsi Function
A	P	Mensintesis protein <i>Synthesizing protein</i>
B	Q	Menjana tenaga <i>Generating energy</i>
C	R	Mengubahsuai, membungkus dan mengangkut molekul yang disintesis oleh sel. <i>Modifies, packages and transports molecules which have been synthesised by the cell.</i>
D	S	Mengangkut protein yang disintesis ke bahagian lain dalam sel. <i>Transporting protein to other part of the cell</i>

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Antara yang berikut, yang manakah ialah tisu epitelium?

Which of the following is an epithelial tissue?

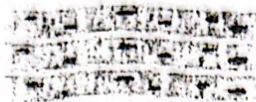
A



B



C



D



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Antara komponen sel berikut, yang manakah terdapat dengan banyak dalam tisu otot?

Which of the following cell components is found in abundance in muscle tissues?

A



B



C

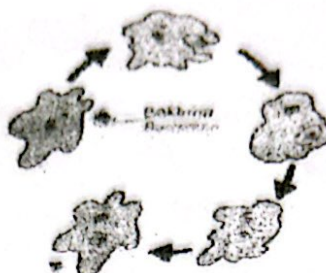


D



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Rajah menunjukkan suatu proses yang berlaku dalam *Amoeba* sp.
Diagram shows a process that occurs in *Amoeba* sp.



Apakah organel yang terlibat dalam proses ini?
What is the organelle involved in this process?

- A Ribosom
Ribosome
- B Lisosom
Lysosome
- C Jalinan endoplasma licin
Smooth endoplasmic reticulum
- D Mitokondria
Mitochondrion

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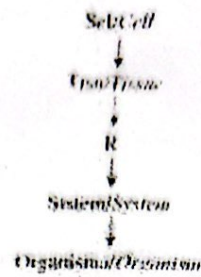
Rajah menunjukkan struktur *Paramecium* sp. Yang hidup di air tawar.
Diagram shows a *Paramecium* sp. that lives in freshwater.



Apakah yang akan berlaku kepada *Paramecium* sp. Sekiranya Y tidak berfungsi?
What will happen to the *Paramecium* sp. if structure Y does not function?

- A Meletus
Burst
- B Menetapkan bentuknya
Maintain its shape
- C Mengecut
Shrink
- D Mengembang
Expand

Berikut adalah organisasi sel dalam organisme multisel.
 The following is cell organisation in a multicellular organism:



Antara yang berikut, yang manakah contoh bagi R?

Which of the following is an example of R?



Rajah menunjukkan proses sintesis enzim dalam sel.
Diagram shows enzymes synthesis inside a cell.

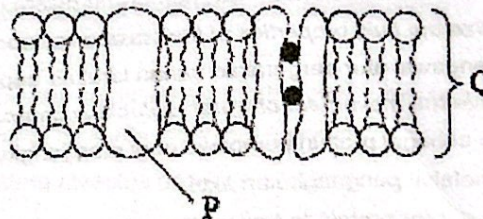


Apakah yang akan berlaku jika tiada struktur R?

What happen if there is no structure of R?

- A Tenaga tidak dapat dihasilkan
No energy is produced
- B Enzim tidak dapat diubahsuai
Enzymes cannot be modified
- C Enzim tidak dapat disintesis
Enzymes cannot be synthesised
- D Protein tidak dapat diangkut ke jasad Golgi
Proteins cannot be transported to Golgi apparatus

11. Rajah 3 menunjukkan struktur membran plasma.
Diagram 3 shows the structure of plasma membrane.



Rajah 3
Diagram 3

Apakah komponen utama P dan Q?

What is the main component of P and Q?

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

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Pernyataan berikut merujuk kepada pergerakan bahan merentasi membrane plasma.
The following statements refer to the movement of substance across the plasma membrane.

- Mengangkut molekul bersalz besar yang larut air mengikut kecerunan kepekatan
Transport large water-soluble molecules according to a concentration gradient
- Memerlukan protein pembawa
Requires carrier protein

Apakah proses tersebut?

What is the process?

- | | |
|---------------------------------------|---|
| A Osmosis
Osmosis | C Pengangkutan aktif
Active transport |
| B Resapan ringkas
Simple diffusion | D Resapan berbantu
Facilitated diffusion |

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Apakah fungsi molekul kolesterol dalam membrane plasma?

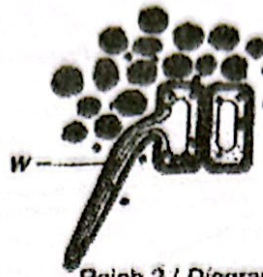
What is the function of cholesterol in plasma membrane?

- A Untuk menolong sel mengenali antara satu sama lain
To help cells recognize each other
- B Untuk menstabilkan sifat bendalir membrane plasma
To stabilize the fluid properties of the plasma membrane
- C Untuk mengawal atur pergerakan bahan larut air seperti ion.
To regulate the movement of water-soluble substances such as ions
- D Bertindak sebagai protein pembawa bagi mengangkut bahan merentasi membrane plasma melalui pengangkutan aktif
Acts as a carrier protein to transport substances across the plasma membrane through active transport

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Rajah 2 menunjukkan suatu proses penyerapan bahan W ke dalam sel rambut akar tumbuhan.

Diagram 2 shows a process of absorption of substance W into plant root hair cells.



Rajah 2 / Diagram 2

Proses penyerapan ini memerlukan tenaga. Apakah bahan W?

This absorption process requires energy. What is substance W?

- | | |
|------------------------------|-----------------------|
| A. Air
Water | G. Oksigen
Oxygen |
| B. Ion natrium
Sodium ion | D. Glukosa
Glucose |

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Antara berikut, proses manakah yang melibatkan resapan berbantu?

Which of the following processes involves facilitated diffusion?

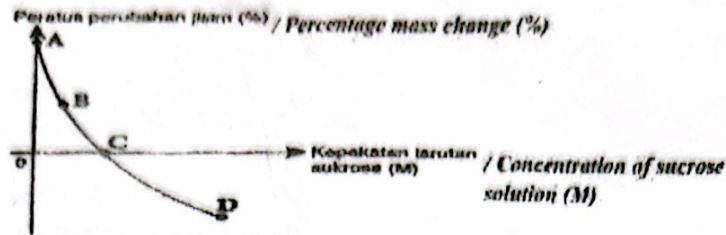
- I. Penyerapan ion mineral ke dalam sel rambut akar tumbuhan.
Absorption of mineral ions into plant root hair cells.
- II. Pertukaran gas antara alveolus dan kapilari darah.
Gaseous exchange between the alveoli and blood capillaries.
- III. Fruktosa diserap ke dalam vilus melalui protein pembawa merentasi membrane plasma.
Fructose is absorbed into the villus via carrier proteins across the plasma membrane.
- IV. Glukosa diangkut ke dalam sel melalui protein pembawa.
Glucose is transported into cells via carrier proteins.

- | | |
|-----------------------------|-----------------------------|
| A. I dan II
I and II | C. III dan IV
III and IV |
| B. II dan III
II and III | D. I dan IV
I and IV |

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Rajah 3 menunjukkan graf keputusan eksperimen bagi menentukan kepekatan sap sel ubi kentang.

Diagram 3 shows a graph of experimental results to determine the concentration of potato cell sap.



Rajah 3 / Diagram 3

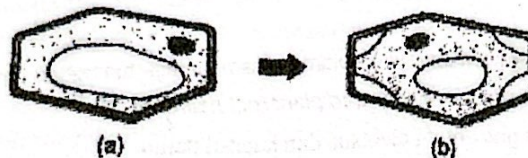
Antara A, B, C dan D, titik manakah yang mewakili kepekatan larutan sukrosa yang hipertonic terhadap sap sel ubi kentang?

Between A, B, C and D, which point represents the concentration of sucrose solution which is hypertonic towards potato cell sap?

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Rajah 4 menunjukkan keadaan satu sel sebelum dan selepas direndam dalam larutan X.

Diagram 4 shows the condition of a cell before and after immersion in solution X.



Rajah 4 / Diagram 4

Apakah larutan X dan proses yang terlibat?

What is solution X and the process involved?

	Larutan X / Solution X	Proses terlibat / Process involved
A	Hipotonik / Hypotonic	Plasmolisis / Plasmolysis
B	Hipotonik / Hypotonic	Deplasmolisis / Deplasmolysis
C	Hipertonik / Hypertonic	Plasmolisis / Plasmolysis
D	Hipertonik / Hypertonic	Deplasmolisis / Deplasmolysis

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Seorang surirumah mendapati bahawa hirisan timun yang direndam di dalam larutan sukrosa 0.2% menjadi keras dan tegar selepas 2 jam. Proses manakah yang menyebabkan hirisan timun itu menjadi keras dan tegar?

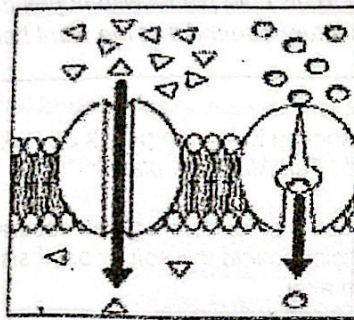
A housewife noticed that cucumber slices that have been immersed in 0.2% sucrose solution become hard and rigid after 2 hours. Which process causes the hardening of the cucumber slices?

- A Sap sel timun adalah hipotonik terhadap larutan sukrosa.
The cucumber cell sap is hypotonic to the sucrose solution.
- B Dinding sel timun bersifat tegar dan tidak mengecut
Cucumber cell walls are rigid and do not shrink
- C Dinding sel timun membenarkan sukrosa meresap ke dalam sel
The cell wall of the cucumber allows the sucrose to diffuse into the cells
- D Kepekatan sap sel timun yang lebih tinggi menyebabkan air meresap ke dalam vakuol
Higher concentrations of cucumber cell sap cause water to diffuse into the vacuoles

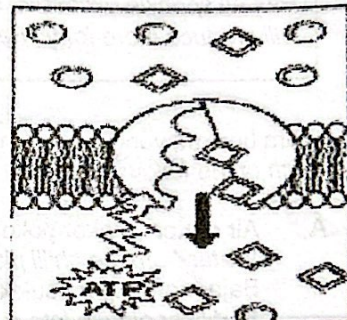
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Rajah di bawah menunjukkan dua proses pengangkutan bahan iaitu proses X dan proses Y.

Diagram below shows two processes on how substance is transported, namely process X and process Y.



Proses X/ Process X



Proses Y/ Process Y

Antara pernyataan berikut, yang manakah menunjukkan persamaan di antara kedua-dua proses X dan Y?

Which of the following statements shows the similarities between the two processes X and Y?

- I Kedua-dua proses X dan Y melibatkan pengangkutan bahan melalui protein liang.
Both processes X and Y involve the transport of substances through the pore proteins.
- II Kedua-dua proses X dan Y melibatkan pengangkutan bahan melawan kecerunan kepekatan.
Both processes X and Y involve the transport of substances against the concentration gradient.
- III Kedua-dua proses X dan Y melibatkan penggunaan protein pembawa.
Both processes X and Y involve the transport of substances through the carrier proteins.
- IV Kedua-dua proses X dan Y mengangkut bahan merentasi lapisan membran plasma.
Both processes X and Y transport substances across the plasma membrane.
- A I dan II
I and II
- B II dan III
II and III
- C III dan IV
III and IV
- D I dan IV
I and IV

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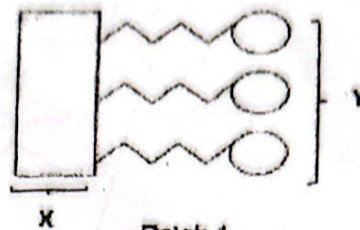
Pak Ali menabur baja berlebihan kepada pokok ladanya dengan harapan ia akan berbuah lebih lebat. Beberapa hari kemudian, dia mendapati pokok ladanya layu.

Pak Ali sprinkle excessive fertiliser to his chilli plants with hopes that the plant will produce more fruits. Few days later he found that the plant becomes wilt.

Antara berikut, yang manakah menerangkan kelayuan pokok cili Pak Ali?
Which of the following explain wilting in Pak Ali's chilli plant?

- A Air daripada akar pokok lada meresap ke dalam tanah secara osmosis.
Water from the chilli plant root diffuse into the soil by osmosis.
- B Baja meresap masuk ke dalam akar.
Fertiliser diffuse into the root.
- C Akar menggunakan terlalu banyak tenaga untuk mengangkut baja ke dalam sel.
Root uses much energy to transport the fertiliser into the cell.
- D Baja terlarut meresap daripada tanah ke dalam akar.
Dissolve fertiliser diffuse from the soil into the root.

Rajah 1 menunjukkan struktur satu trigliserida
Diagram 1 shows the structure of a triglyceride.



Rajah 1
Diagram 1

Apakah yang diwakili oleh X dan Y?
What are represented by X dan Y?

	X	Y
A	Asid lemak Fatty acid	Asid fosforik Phosphoric acid
B	Asid amino Amino acid	Gliserol Glycerol
C	Gliserol Glycerol	Asid lemak Fatty acid
D	Fosfat Phosphate	Asid lemak Fatty acid

Maklumat berikut merujuk kepada fungsi bahan K dalam sel.
The following information refers to the function of substance K in cell.

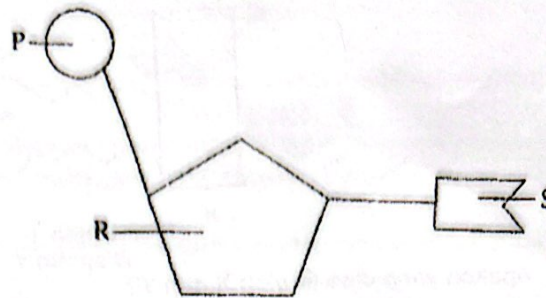
- Dapat menyerap banyak tenaga haba dengan kenaikan suhu yang kecil
Able to absorb a lot of heat energy with a small rise in temperature.
- Mengekalkan tekanan osmotik dalam sel
Maintaining osmotic pressure of cells

Apakah bahan K?

What is substance K?

- | | | | |
|---|---------------|---|-------------------|
| A | Lipid / Lipid | C | Protein / Protein |
| B | Water / Air | D | Enzyme / Enzim |

23. Rajah 4 menunjukkan struktur asas DNA.
Diagram 4 shows the basic structure of DNA.

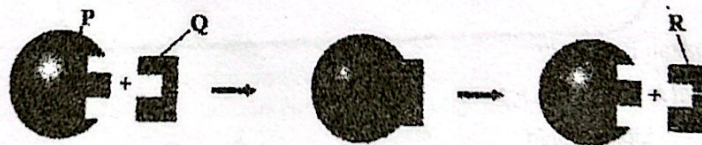


Rajah 4
Diagram 4

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

	P	R	S
A	Bes bernitrogen <i>Nitogenous base</i>	Gula deoksiribosa <i>Deoxysiribose sugar</i>	Kumpulan fosfat <i>Phosphate group</i>
B	Kumpulan fosfat <i>Phosphate group</i>	Gula deoksiribosa <i>Deoxysiribose sugar</i>	Bes bernitrogen <i>Nitogenous base</i>
C	Kumpulan fosfat <i>Phosphate group</i>	Nukleotida <i>Nucelotide</i>	Bes bernitrogen <i>Nitogenous base</i>
D	Bes bernitrogen <i>Nitogenous base</i>	Kumpulan fosfat <i>Phosphate group</i>	Nukleotida <i>Nucelotide</i>

24. Rajah 5 menunjukkan hipotesis 'mangga dan kunci' bagi tindakan enzim.
Diagram 5 shows the 'lock and key' hypothesis of enzyme action.



Rajah 5
Diagram 5

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

	P	Q	R
A	Hasil <i>Product</i>	Enzim <i>Enzyme</i>	Substrat <i>Substrate</i>
B	Enzim	Substrat	Hasil

	<i>Enzyme</i>	<i>Substrate</i>	<i>Product</i>
C	Substrat	Enzim	Hasil
	<i>Substrate</i>	<i>Enzyme</i>	<i>Product</i>
D	Enzim	Hasil	Substrat
	<i>Enzyme</i>	<i>Product</i>	<i>Substrate</i>

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Dipeptida boleh diuraikan kepada asid amino melalui

A dipeptide can be broken down into amino acids through

A hidrolisis

hydrolysis

B kondensasi

condensation

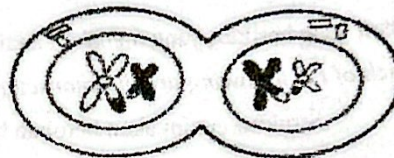
C pempolimeran

polymerization

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Rajah 3 menunjukkan fasa M dalam pembahagian sel.

Diagram 3 shows M phase in cell division.



Fasa M
M phase

Rajah 3
Diagram 3

Apakah fasa sebelum fasa M?

What is the phase before M phase?

A Anafasa I

Anaphase I

B Telofasa I

Telophase I

C Profasa II

Prophase II

D Telofasa II

Telophase II

27. Rajah 6 menunjukkan satu fasa mitosis dalam sel.
Diagram 6 shows a phase of mitosis in a cell.



Rajah 6
Diagram 6

Apakah peringkat sebelum fasa itu?
What is the stage before this phase?

- | | | | |
|---|------------------------------|---|------------------------------|
| A | Profasa
<i>Prophase</i> | C | Anafasa
<i>Anaphase</i> |
| B | Metafasa
<i>Metaphase</i> | D | Telofasa
<i>Telophase</i> |

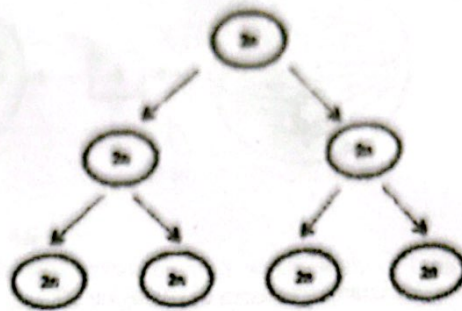
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Antara yang berikut, yang manakah adalah ciri-ciri bagi enzim?
Which of the following are the characteristics of enzymes?

- | | |
|-----|--|
| I | Siruktur enzim akan berubah bentuk pada akhir tindak balas.
<i>Structure of enzymes are changed at the end of a reaction.</i> |
| II | Enzim hanya diperlukan dalam kuantiti yang kecil sahaja.
<i>Enzymes are only required in small amounts</i> |
| III | Tindakan enzim adalah spesifik.
<i>The action of enzymes is specific.</i> |
| IV | Enzim memangkinkan tindak balas sehalu sahaja.
<i>Reactions catalysed by enzymes are irreversible only</i> |
| A | I dan II
<i>I and II</i> |
| B | II dan III
<i>II and III</i> |
| C | III dan IV
<i>III and IV</i> |
| D | I dan IV
<i>I and IV</i> |

Rajah 3 menunjukkan bilangan sel yang terhasil selepas satu sel mengalami mitosis sebanyak dua kali.

Diagram 3 shows the number of cells produced after a cell has undergone two times of mitosis.



Rajah 3

Diagram 3

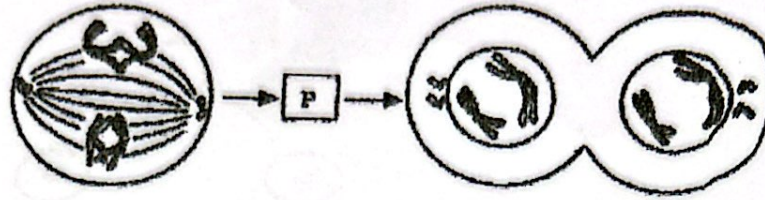
Berapakah bilangan sel yang terhasil jika mitosis berlaku sebanyak dua kali lagi?

How many number of cells produced if mitosis occurs another two times?

- A 4
- B 8
- C 16
- D 32

Rajah 4 menunjukkan dua peringkat meiosis.

Diagram 4 shows two stages in meiosis.



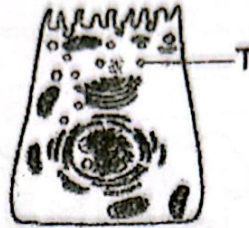
Rajah 4

Apakah perlakuan kromosom di peringkat P?

What is the chromosomal behaviour at stage P?

- A Kromosom menebal dan memendek.
Chromosomes thicken and condense.
- B Kromosom tersusun pada satah khatulistiwa.
Chromosomes arrange themselves around equatorial plane.
- C Kromosom homolog berpasangan dan pindah silang berlaku.
Homologous chromosomes pair together and crossing over occurs.
- D Kromosom homolog berpisah dan bergerak ke kutub bertentangan.
Homologous chromosomes separate and move to the opposite poles.

Rajah 3 menunjukkan komponen sel yang terlibat di dalam penghasilan enzim ekstrasel.
Diagram 3 shows cell components that are involved in the production of extracellular enzymes.



Rajah 3 / Diagram 3

Apakah yang akan berlaku kepada proses tersebut sekiranya T gagal bercantum dengan membran plasma?
What would happen to the process if T failed to fuse with the plasma membrane?

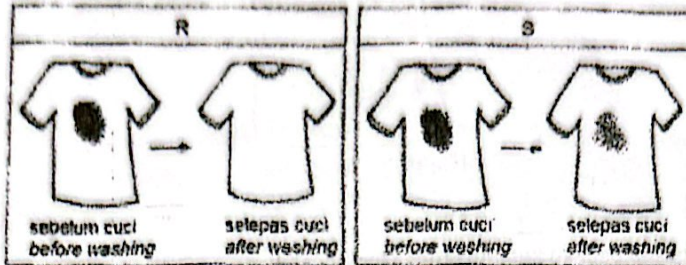
- A Sintesis protein tidak berlaku.
Protein synthesis does not occur.
- B Enzim tidak dapat diangkut.
Transportation of enzyme does not occur.
- C Protein tidak dapat diubahsuai.
Modification of protein does not occur.
- D Enzim tidak dapat dirembeskan.
Enzymes are not secreted.

Manakah antara berikut menunjukkan kesan enzim ke atas tenaga pengaktifan bagi suatu tindak balas biokimia?
Which of the following shows the effect of enzymes on the activation energy of the biochemical reaction?

- A Hasil tindak balas lebih sedikit.
Less products of the reaction.
- B Kadar tindak balas biokimia lebih cepat.
Biochemical reactions are faster.
- C Pembentukan kompleks enzim-substrat perlahan.
Slow formation of enzyme-substrate complexes.
- D Tenaga pengaktifan diperlukan dengan lebih tinggi.
The activation energy is required to be higher.

Rajah 5 menunjukkan dua helai pakaian R dan S yang dikotori oleh kesan darah. Baju-baju tersebut telah dicuci menggunakan serbuk bio detergen yang mengandungi enzim X pada suhu yang berbeza.

Diagram 5 shows two clothes of R and S were stained by blood. The clothes were washed using bio detergent powder containing enzyme X at different temperatures.



Rajah 5 / Diagram 5

Apakah enzim X dan suhu yang mungkin telah digunakan untuk R dan S?

What is enzyme X and temperature may have been used for R and S?

	Enzim Enzyme	Suhu (°C) untuk R Temperature (°C) for R	Suhu (°C) untuk S Temperature (°C) for S
A	Selulase Cellulase	20	37
B	Protease Protease	20	37
C	Selulase Cellulase	37	20
D	Protease Protease	37	20

Apakah proses yang melibatkan pembahagian nukleus?

What is the process involved in nuclear division?

- A. Meiosis I
Meiosis I
- B. Meiosis II
Meiosis II
- C. Sitokinesis
Cytokinesis
- D. Kariokinesis
Karyokinesis

Rajah 1 menunjukkan fasa dalam kitar sel.

Diagram 1 shows phases of a cell cycle.



Rajah 1/ Diagram 1

Antara yang berikut, yang manakah betul tentang fasa dalam kitar sel?

Which of the following is correct about the phases in the cell cycle?

	G1	S	G2	Fasa M / M phase
A	Penghasilan ATP ATP production	Pembahagian nucleus Nuclear division	Sintesis organel Synthesis of organelle	Replikasi DNA DNA replication
B	Sintesis organel Synthesis of organelle	Replikasi DNA DNA replication	Penghasilan ATP ATP production	Pembahagian nucleus Nuclear division
C	Penghasilan ATP ATP production	Sintesis organel Synthesis of organelle	Pembahagian nucleus Nuclear division	Replikasi DNA DNA replication
D	Sintesis organel Synthesis of organelle	Penghasilan ATP ATP production	Replikasi DNA DNA replication	Pembahagian nucleus Nuclear division

Rajah 4 menunjukkan nukleus satu sel yang terdapat dalam organ pembiakan seekor haiwan.

Diagram 4 shows the nucleus of a cell found in the reproductive organ of an animal.



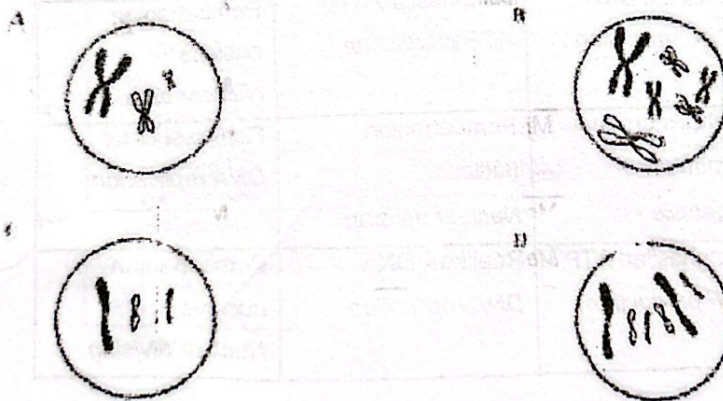
Rajah 4 / Diagram 4

Nukleus ini mengalami pembahagian untuk menghasilkan gamet.

Antara berikut, rajah yang manakah menunjukkan nukleus salah satu gamet selepas pembahagian nukleus ini lengkap?

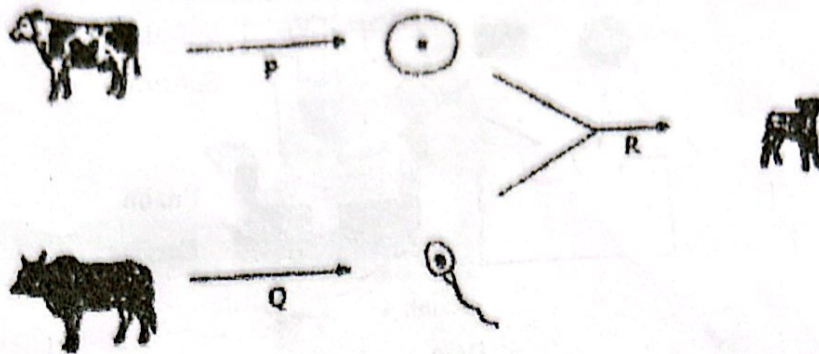
This nucleus undergoes division to produce gametes.

Which of the following diagram shows the nucleus of one of the gametes after the nuclear division is completed?



Rajah 7 menunjukkan pembiakan seekor lembu.

Diagram 7 shows a reproduction of cow.



Rajah 7 / Diagram 7

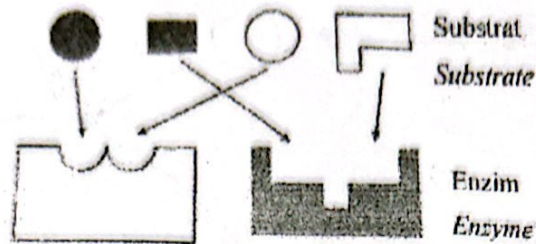
Apakah yang diwakili oleh P, Q dan R?

What is represented by P, Q and R?

	P	Q	R
A.	Mitosis Mitosis	Meiosis Meiosis	Mitosis Mitosis
B.	Mitosis Mitosis	Mitosis Mitosis	Meiosis Meiosis
C.	Meiosis Meiosis	Mitosis Mitosis	Meiosis Meiosis
D.	Meiosis Meiosis	Meiosis Meiosis	Mitosis Mitosis

Rajah 4 menunjukkan hipotesis "mangga dan kunci" bagi tindakan enzim.

Diagram 4 shows the "lock and key" hypothesis of enzyme action.



Rajah 4

Diagram 4.

Berdasarkan rajah, apakah ciri yang ditunjukkan oleh enzim?

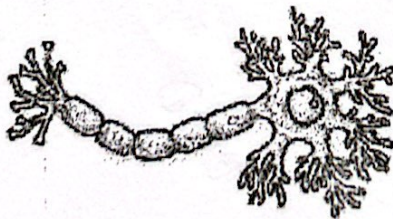
Based on diagram, what characteristic does this enzyme show?

- A Tindak balas enzim adalah berbalik
Enzyme reaction is reversible
- ☒ B Tindak balas enzim adalah spesifik
Enzyme reaction is specific
- C Tindak balas enzim dipengaruhi oleh suhu
Enzyme reaction is affected by temperature
- D Tindak balas enzim berubah selepas tindak balas
Enzyme reaction changes after the reaction

Antara yang berikut, sel yang manakah terhasil melalui proses meiosis?

Which of the following cells is produced through the process of meiosis?

A



B



C



D



Rajah 7 menunjukkan ciri yang dipamerkan oleh seorang kanak-kanak yang mengalami kecacatan genetik. Antara ciri-ciri tersebut ialah terowot memal dan mata sepet.

Diagram 7 shows the characteristics exhibited by a child with a genetic disorder. Among the characteristics are mentally retarded and slanted eyes.



Rajah 7
Diagram 7

Apakah punca kecacatan genetik tersebut?

What is the cause of the genetic disorder?

- A Sinapsis tidak berlaku semasa profasa I
Synapsis did not occur during prophase I
- B Sitokinesis tidak berlaku semasa telofasa II
Cytokinesis did not occur during telophase II
- C Membran nukleus tidak terbentuk semasa telofasa II
Nuclear membrane did not form during telophase II
- D Kromosom homolog gagal berpisah semasa anafasa I
Homologous chromosome fail to separate during anaphase I

SOALAN TAMAT