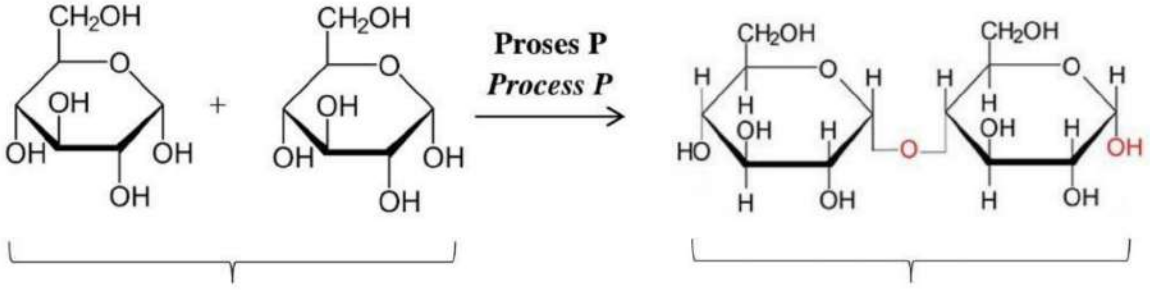
2. Rajah 2.1 menunjukkan proses pembentukan molekul Y daripada dua struktur molekul glukosa.

Diagram 2.1 *shows the process of formation molecule Y from the two molecular structures of glucose.*



Rajah 2.1
Diagram 2.1

(a) (i) Namakan proses P.

Name the process P.

Proses P : Kondensasi

Process P: Condensation

[1 markah]
[1 *mark*]

(ii) Berdasarkan Rajah 2.1, terangkan pembentukan molekul Y.

Based on Diagram 2.1, *explain the formation of molecule Y.*

P1 Dua molekul glukosa bergabung melalui proses kondensasi
Two molecules of glucose combine through condensation process

P2 untuk membentuk 1 molekul Y / maltosa
To form one molecule Y / maltose

[2 markah]
[2 *marks*]

P3 (Melibatkan) Penyingkiran 1 molekul air
(Involves) the removal of one water molecule

(b) Tuliskan persamaan perkataan bagi proses P.

Write the word equation for the process P.

Glukosa + Glukosa $\xrightarrow{\text{Kondensasi}}$ Maltosa + Air

[1 markah]
[1 *mark*]

Glucose + Glucose $\xrightarrow{\text{Condensation}}$ Maltose + Water

(c)

Filem boleh dimakan daripada rumpai laut

Edible films from seaweed

Kajian pembangunan filem boleh dimakan berasaskan rumpai laut tempatan sebagai bahan pembungkus produk makanan telah dilakukan. Rumpai laut ialah sumber asli yang mapan serta berpotensi, tetapi masih belum digunakan sepenuhnya. Penanaman rumpai laut telah berkembang pesat di Malaysia, terutama di Sabah yang merupakan salah satu pengeluar rumpai laut di dunia. dengan jumlah pengeluaran dalam tahun 2010 adalah sebanyak 150,000 tan metrik dan dijangka menghasilkan 1,500,000 tan metrik pada tahun 2020.

The research on the development of edible film based on local seaweed as a packaging material for food products was conducted. Seaweed is a sustainable natural resource with potential but still under utilized. Sea weed cultivation has grown rapidly in Malaysia, especially in Sabah which is one of the world's largest producers of seaweed with a total production of 150,000 *metric tonnes in* 2010 *and is expected to produced* 1,500,000 *metric tonnes in* 2020.

Buletin Teknologi MARDI, Bil.8(2015): 25 – 35

Bagaimanakah rumpai laut dalam filem dapat mengurangkan impak negatif kepada pengguna?

How can seaweed in film can reduce the negative impact on consumers?

P1 Terdiri daripada selulosa
Composed of cellulose

P2 Sumber bahan mesra alam
Environmentally friendly source [2 markah]

P3 Merupakan bahan terbiodegradasi [2 *marks*]
Biodegradable material

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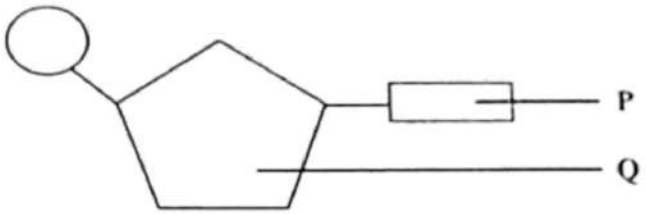
2. Rajah 2.1 menunjukkan satu monomer nukleotida.
Diagram 2.1 shows a nucleotide monomer.



Rajah 2.1
Diagram 2.1

a. (i) Nyatakan nama komponen P dan Q.
State the name of components P *and* Q.

P: Bes bernitrogen / *Nitrogenous base*

Q: Gula pentosa / *Pentose sugar*

[2 markah]
[2 *marks*]

(ii) Terangkan **dua** kepentingan asid nukleik di dalam sel.
Explain **two** *importances of nucleic acids in cells.*

P1 Membawa maklumat pewarisan
Carry genetics information

P2 Mengandungi kod genetik yang dibawa oleh bes bernitrogen
Contains genetic codes carry by nitrogenous base

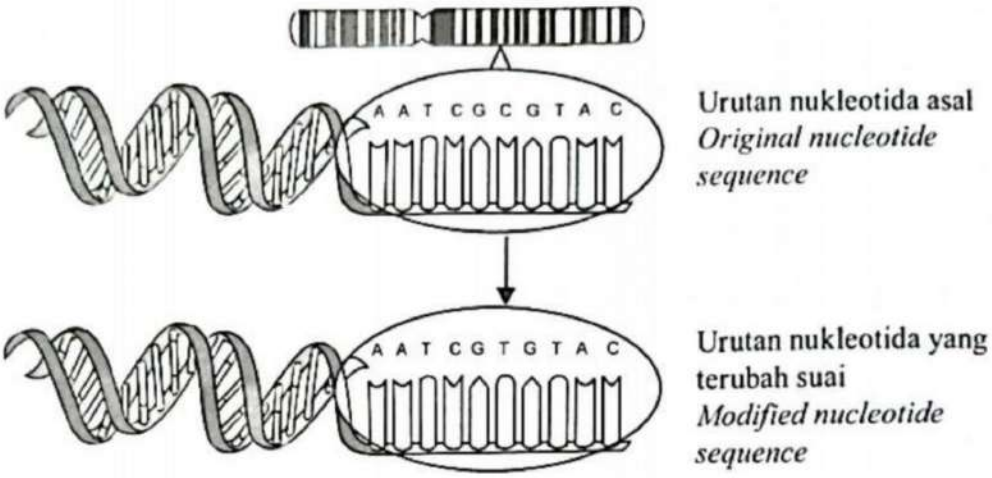
P3 untuk sintesis protein / polipeptida
for protein / polypeptides synthesis

P4 Penentuan ciri organisma hidup
Determine the traits of living organisms

[2 markah]
[2 *marks*]

b. Pendedahan terhadap sinar-X yang berterusan telah menyebabkan berlakunya perubahan pada urutan nukleotida asal seperti yang ditunjukkan dalam Rajah 2.2.

Exposure to continuous X-rays causes changes in the original nucleotide sequence as shown in Diagram 2.2.



Rajah 2.2
Diagram 2.2

Terangkan kesan daripada perubahan urutan nukleotida ini.

Explain the effect of this nucleotide sequence change.

P1 Mutasi gen
Gene mutation

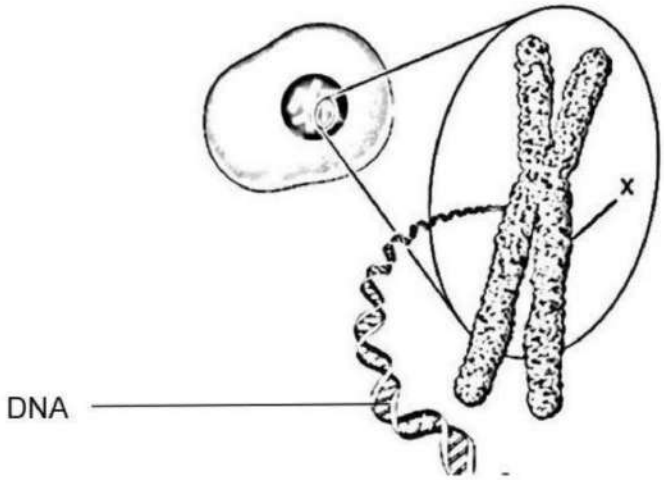
P2 Penggantian bes // Mengubah kod genetik
Base substitution // Change the genetic code

P3 Mengubah urutan asid amino // Mensintesis protein baharu
Change the sequence of amino acids // Synthesised new protein [2 markah]

P4 Protein baharu tidak dapat berfungsi [2 *marks*]
The new protein is not functioning

Bahagian A
Section A
[60 markah]
[60 *marks*]
Jawab semua soalan di bahagian Ini.
Answer all the questions in this section.

1. Rajah 1.1 menunjukkan sel haiwan.
Diagram 1.1 shows an animal cell.

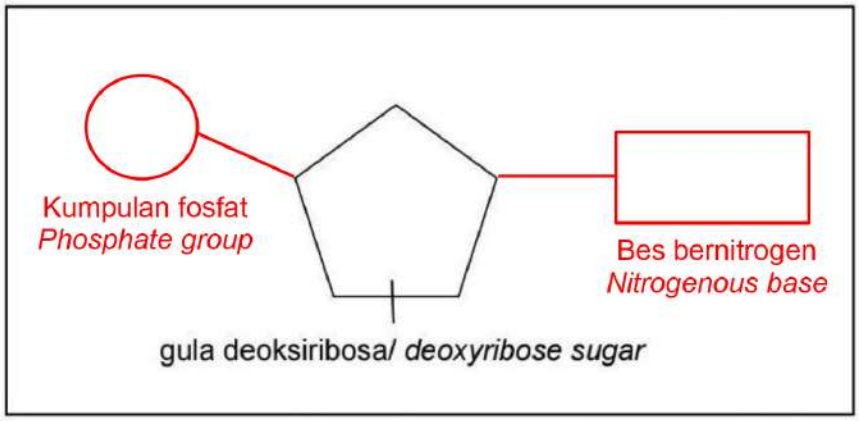


Rajah 1.1/*Diagram 1.1*

(a) (i) Namakan struktur X.
Name structure X.
Kromosom / *Chromosome*

[1 markah/*mark*]

Struktur X terbentuk daripada rantaian polinukleotida DNA yang berpintal dengan protein yang disebut histon. Lengkapkan struktur nukleotida di dalam kotak di bawah.
Structure X is formed from DNA polynucleotide chains that are intertwined with proteins called histones. Complete the nucleotide structure in the box below.



[2 markah/*marks*]

(ii) Terdapat dua jenis asid nukleik iaitu DNA dan RNA. Bandingkan kedua-dua struktur ini.
There are two types of nucleic acid that are DNA and RNA. Compare these two structures.

DNA	RNA
Terdiri daripada gula pentosa, kumpulan fosfat dan bes bernitrogen *Made up of pentose sugar, phosphate group & nitrogenous base*	
Struktur terdiri daripada dua rantaian polinukleotida *Structure consists of* *two polynucleotide chains*	Struktur terdiri daripada satu rantai polinukleotida tunggal *Structure consists of* *a single polynucleotide chain*
Bes bernitrogen terdiri daripada adenina, guanina, sitosina, timina *Nitrogenous base consists of* *adenine, guanine, cytosine, thymine*	Bes bernitrogen terdiri daripada adenina, guanina, sitosina, urasil *Nitrogenous base consists of* *adenine, guanine, cytosine, uracil*

[3 markah/*marks*]

Mengandungi gula deoksiribosa
Consists of deoxyribose sugar

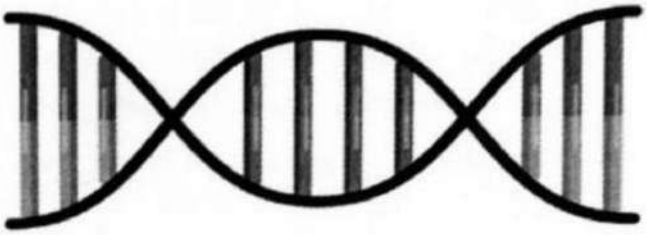
Mengandungi gula ribosa
Consists of ribose sugar

Bahagian A
Section A

[60 *markah*]
[60 *marks*]

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

1 Rajah 1.1 menunjukkan struktur sejenis asid nukleik.
Diagram 1.1 *shows the structure of a type of nucleic acid.*



Rajah 1.1
Diagram 1.1

(*a*) Berdasarkan Rajah 1.1,
Based on Diagram 1.1,

(i) Namakan jenis asid nukleik tersebut.
Name the type of the nucleic acid.

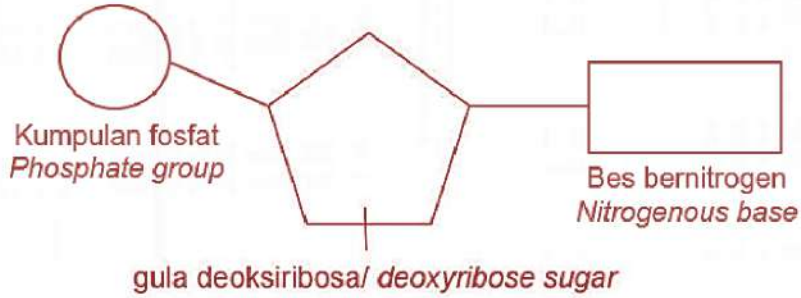
1(*a*)(i) 1

Asid deoksiribonukleik (DNA) / *Deoxyribonucleic acid* (DNA)

.....

[1 *markah*]
[1 *mark*]

(ii) Nukleotida merupakan unit asas bagi asid nukleik.
Lukis dan labelkan struktur nukleotida.
Nucleotide is the basic unit for nucleic acids.
Draw and label the structure of nucleotide.



Untuk Kegunaan Pemeriksa

(*b*) Terangkan peranan asid nukleik kepada organisma.

Explain the role of nucleic acid to organisms.

P1 Membawa maklumat pewarisan
Carry genetics information

P2 Menentukan ciri organisma hidup
Determine the traits of living organisms

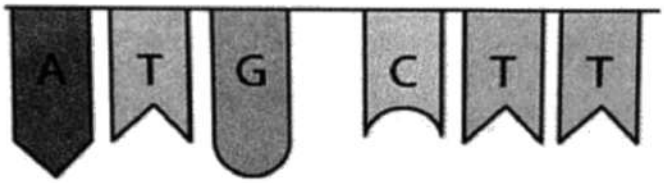
P3 Mengandungi kod genetik
Contains genetic codes

[2 *markah*]
[2 *marks*]

1(*b*) 2

(*c*) Rajah 1.2 menunjukkan urutan bes bernitrogen pada satu rantai polinukleotida.

Diagram 1.2 *shows the sequence of nitrogenous bases in a polynucleotide chain.*



Rajah 1.2
Diagram 1.2

Nyatakan urutan bes bernitrogen yang sepadan bagi polinukleotida tersebut selepas proses transkripsi. *transkripsi = rantai RNA (A-U, T-A) (G-C, C-G)

State the match for the nitrogenous base sequence of the polynucleotide after the process of transcription. *transcription = RNA chain (A-U, T-A) (G-C, C-G)

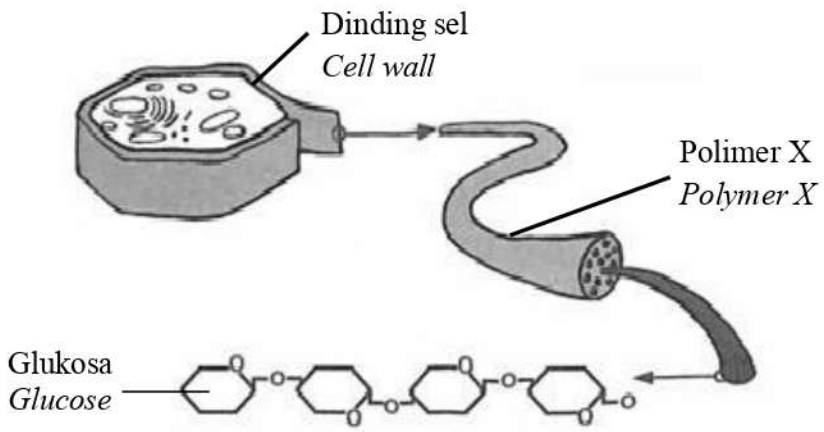
UAC GAA

[1 *markah*]
[1 *mark*]

1(*c*) 1

TRIAL N. SEMBILAN 2023

3 Rajah 3.1 menunjukkan suatu polimer X di dalam dinding sel tumbuhan.
Diagram 3.1 shows polymer X in the cell wall of a plant.



Rajah 3.1 / *Diagram 3.1*

(a) (i) Namakan polimer X.
Name polymer X.

3 (a)(i)

Seluosa / *Cellulose*

[1 markah / *mark*]

(ii) Jelaskan pembentukan polimer X.
Explain the formation of polymer X.

3 (a)(ii)

P1 Melalui proses kondensasi
Through condensation process

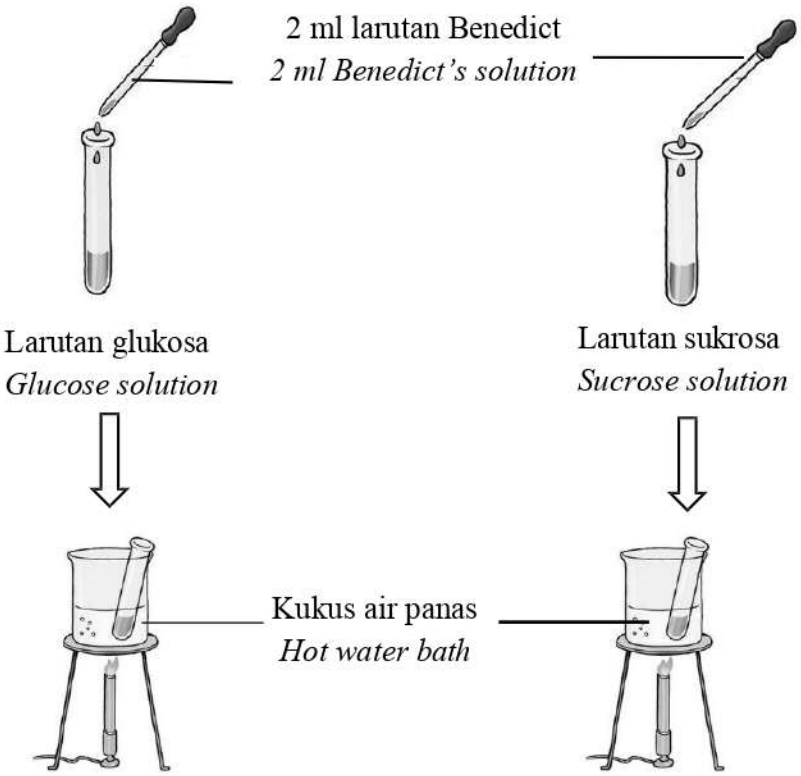
P2 Penyingkiran molekul air
Removal of water molecule

P3 Glukosa bergabung membentuk rantai molekul yang panjang
Glucoses combine to form long molecular chains

[2 markah/ *marks*]

For Examiner's Use

(b) Rajah 3.2 menunjukkan suatu eksperimen untuk menentukan kehadiran gula penurun dan gula bukan penurun.
Diagram 3.2 shows an experiment to determine the presence of reducing sugar and non-reducing sugar.



Rajah 3.2 / *Diagram 3.2*

Terangkan keputusan eksperimen di atas.
Explain the result of the above experiment.

P1 Glukosa menukarkan warna biru larutan Benedict kepada merah bata
Glucose changes the blue colour of Benedict solution to brick-red

P2 Bagi larutan sukrosa warna biru larutan Benedict tidak berubah / kekal
For sucrose blue colour of Benedict solution unchanged / remains

P3 Glukosa ialah gula penurun / menurunkan kuprum (II) sulfat kepada kuprum (i) oksida // Sukrosa bukan gula penurun / tidak menurunkan kuprum (II) sulfat kepada kuprum (i) oksida
Glucose is reducing sugar / reduces copper (II) sulphate to copper (I) oxide // Sucrose is non-reducing sugar / does not reduce copper (II) sulphate to copper (I) oxide [2 markah / *marks*]

3 (b)
2

For Examiner's Use

(c) Rajah 3.3 menunjukkan benang pembedahan yang diperbuat daripada sejenis polisakarida.
Diagram 3.3 shows shows a surgical thread made of a type of polysaccharide.

Rajah 3.3 / *Diagram 3.3*

(i) Namakan polisakarida yang digunakan dalam Rajah 3.3.
Name the polysaccharide that used in Diagram 3.3.

Kitin / *Chitin*
.....
[1 markah]

3 (c)(i) 1

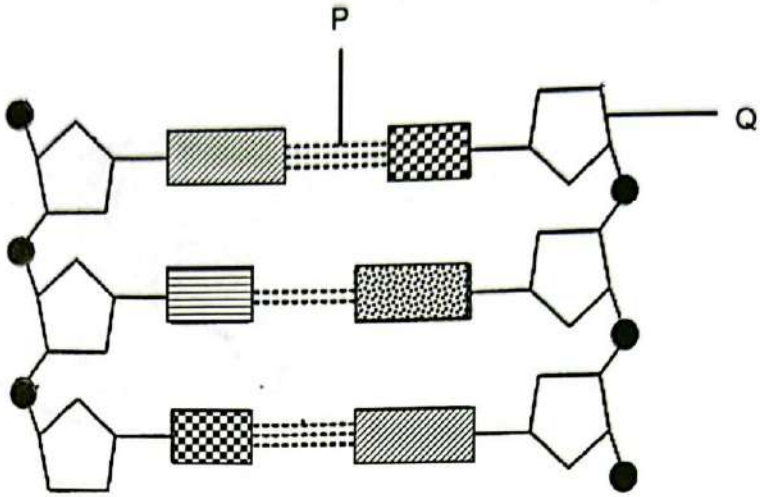
(ii) Nyatakan **satu** kelebihan benang pembedahan dalam Rajah 3.3.
*State **one** advantage of the surgical thread in Diagram 3.3.*

Kitin terurai selepas luka yang dijahit sembuh
Chitin will decompose after the sewn wound heals
.....
[1 markah]

3 (c)(ii) 1

Total A3 7

2. (a) Rajah 2.1 menunjukkan struktur satu jenis asid nukleik.
Diagram 2.1 shows the structure of a type of nucleic acid.



Rajah 2.1
Diagram 2.1

(i) Namakan bahagian berlabel P dan Q.
Name parts labelled P and Q.

P: Ikatan hydrogen / *Hydrogen bond*

Q: Gula deoksiribosa / Gula pentosa
Deoxyribose sugar / Pentose sugar

[2 markah]
[*2 marks*]

(ii) Nyatakan fungsi asid nukleik dalam Rajah 2.1 dalam organisma.
State the function of nucleic acid in Diagram 2.1 in an organism.

P1 Membawa maklumat pewarisan
Carry genetics information

P2 Menentukan ciri organisma hidup
Determine the traits of living organisms

P3 Mengandungi kod genetik
Contains genetic codes

[1 markah]
[*1 mark*]

(iii) Nyatakan satu ciri yang terdapat pada asid nukleik dalam Rajah 2.1.
State one characteristic of nucleic acid in Diagram 2.1.

P1 Terdiri daripada dua rantai polinukleotida
Consists of two polynucleotide chains

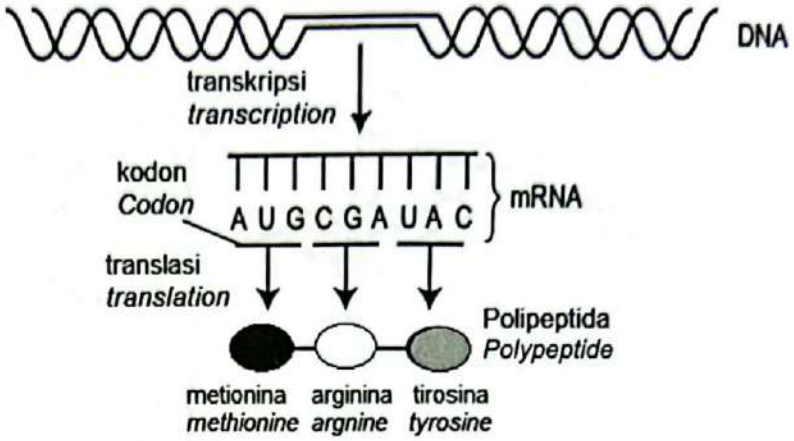
P2 Dua rantai polinukleotida berpintal / heliks ganda dua
Two intertwined polynucleotide chains / double helix

P3 Bes bernitrogen terdiri daripada adenina, guanina, sitosina, timina
Nitrogenous base consists of adenine, guanine, cytosine thymine

[1 markah]
[*1 mark*]

(b) Rajah 2.2 menunjukkan proses-proses yang berlaku semasa sintesis protein.

Diagram 2.2 shows the processes that occur during protein synthesis.



Rajah 2.2

Diagram 2.2

Terangkan kesannya ke atas sintesis protein sekiranya proses transkripsi tidak berlaku?

Explain the effect on protein synthesis if transcription process fails to occur?

P1 mRNA tidak dapat dibentuk / Tiada kodon
mRNA cannot be formed / No codons

P2 Menyebabkan proses translasi tidak berlaku
Causes the translation process does not occur

P3 Tiada penghasilan rantai polipeptida / Tiada sintesis protein
No polypeptide chains are produced / No protein synthesis

[2 markah]
[2 *mark*]