

Structure and replication of DNA

Question Paper 2

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Nucleic acids and protein synthesis
Sub Topic	Structure and replication of DNA
Booklet	Theory
Paper Type	Question Paper 2

Time Allowed : 46 minutes

Score : / 38

Percentage : /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	77.5%	70%	62.5%	57.5%	45%	<45%

1

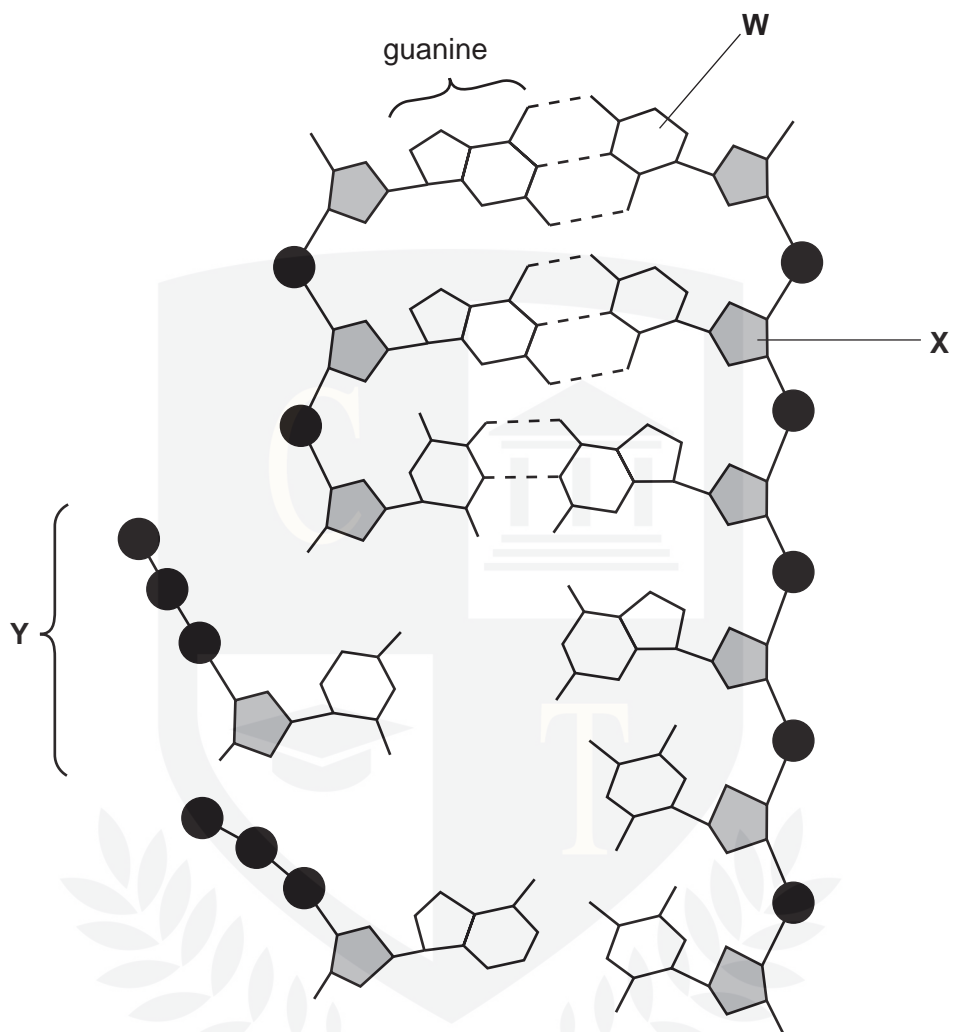


Fig. 1.1

(a) Name **W** to **Y**.

W

x

Y [3]

(b) Explain how the structure of DNA enables it to replicate semi-conservatively.

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..... [3]

(c) Explain why it is important that an exact copy of DNA is made during replication.

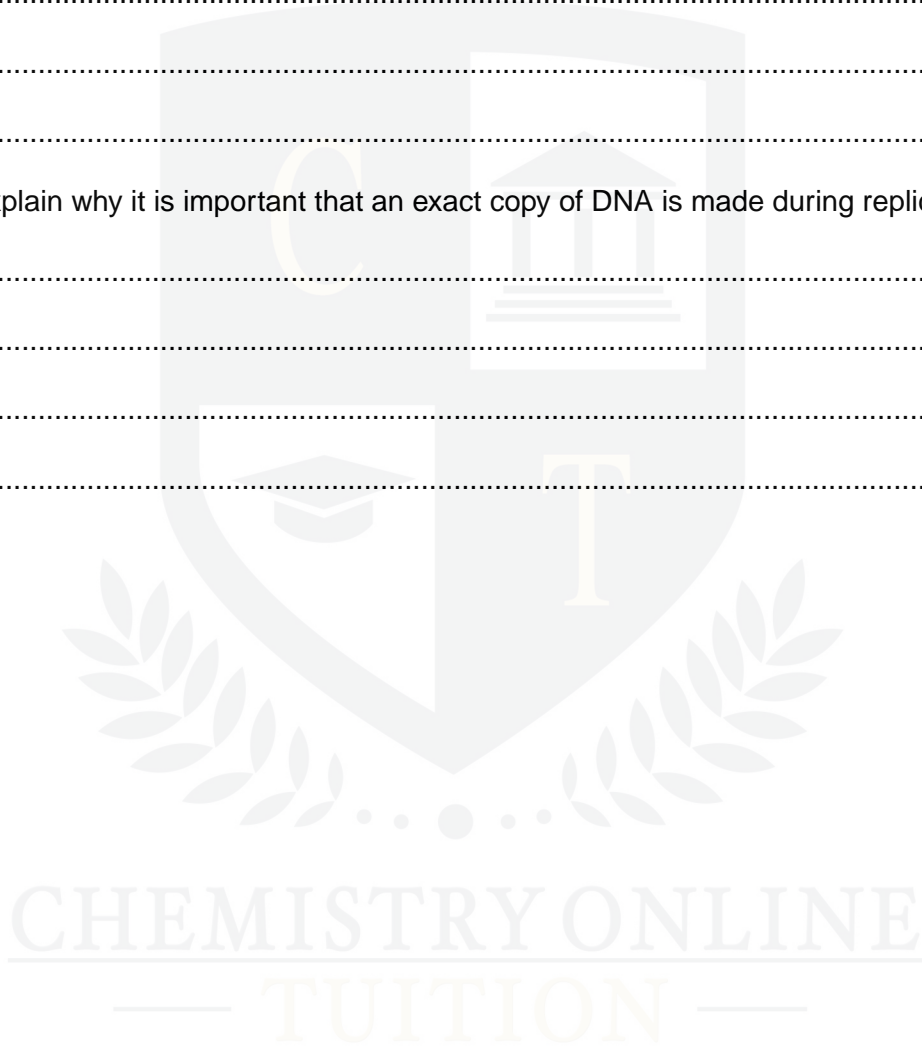
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..... [2]

[Total: 8]



2 Fig. 5.1 represents part of a DNA molecule.

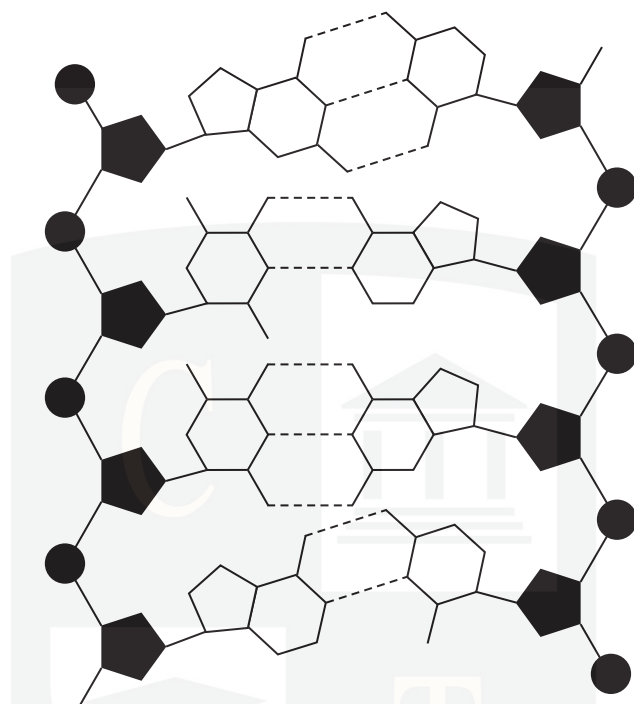


Fig. 5.1

(a) On Fig. 5.1

(i) draw a box around a nucleotide

[1]

(ii) label, with the letter **P**, a phosphate group.

[1]

CHEMISTRY ONLINE
— TUITION —

(b) Describe how a DNA molecule replicates.



[5]

(c) DNA codes for polypeptides in cells. Transfer RNA (tRNA) is involved in this process.

Describe the role of tRNA in the production of polypeptides in cells.

CHMISTRY ONLINE

— TUTORIAL —

[3]

[Total: 10]

3 Fig. 6.1 shows the structure of ATP.

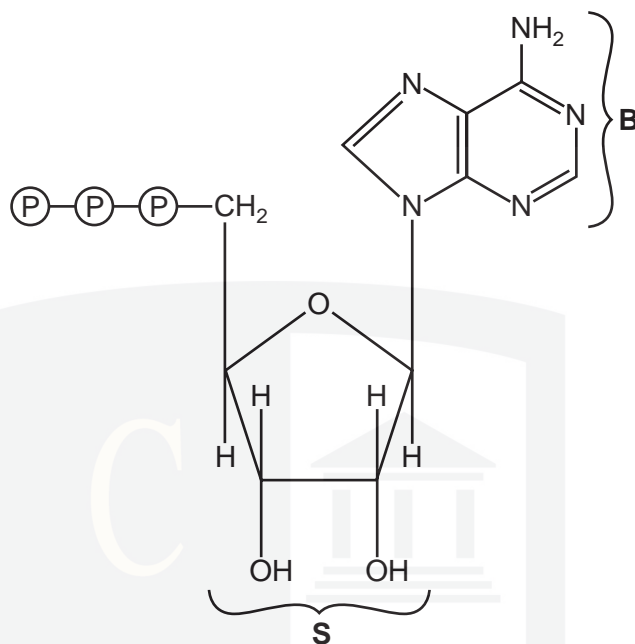


Fig. 6.1

(a) (i) Name the nitrogenous base labelled **B**.

.....[1]

(ii) Name the sugar labelled **S**.

.....[1]

(b) ATP is described as having a universal role as the energy currency in all living organisms. Explain why it is described in this way.

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.....[4]

(c) State **precisely** two places where ATP is synthesised in cells.

1

.....

2

..... [2]

[Total: 8]



- 4 Fig. 1.1 is a diagram of an electron micrograph of a plant cell.
Fig. 1.2 is a diagram of an electron micrograph of an animal cell.
Both diagrams are incomplete.

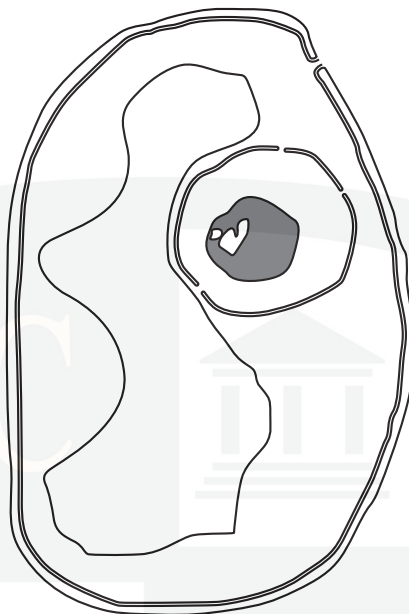


Fig. 1.1

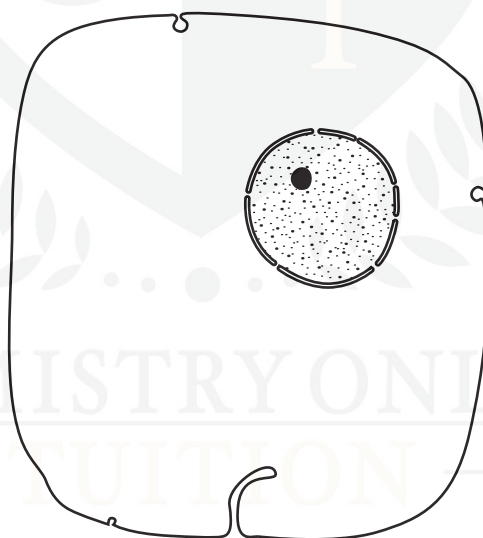


Fig. 1.2

- (a) Explain how Fig. 1.1 can be identified as a plant cell.

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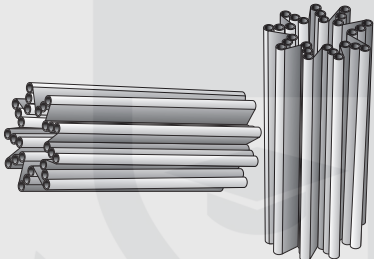

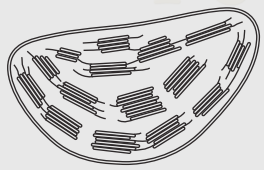
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.....[2]

- (b) Some organelles are missing from Figs 1.1 and 1.2. Information about these organelles is shown in the shaded boxes in Table 1.1.

Complete the empty boxes in Table 1.1 by adding the correct information below each column heading.

Table 1.1

name of organelle	diagram of organelle(s) as seen under the electron microscope (not to scale)	one function of organelle	cell type(s) in which organelle is located
mitochondrion			animal and plant
		assemble microtubules to produce the mitotic spindle	
rough endoplasmic reticulum		protein synthesis	
Golgi apparatus			animal and plant
		photosynthesis	plant only

[8]

[Total: 10]