



CHEMISTRY ONLINE
— **TUITION** —

Phone: +442081445350

www.chemistryonlinetuition.com

Email: asherrana@chemistryonlinetuition.com

BIOLOGY

BIOLOGICAL MOLECULES

LEVEL & BOARD:	AQA (A - LEVEL)
TOPIC:	Nucleic Acids
PAPER TYPE:	QUESTION PAPER
TOTAL QUESTIONS:	06
TOTAL MARKS:	28

Show your working. (2)

Answer

(c) Name the protein that binds to DNA in chromosomes. (1)

.....

(d) Explain how the two strands of a DNA molecule are split apart during semi-conservative DNA replication so that each one can serve as a template for the synthesis of a new complementary strand. (2)

.....
.....
.....
.....
.....
.....

3.

(a) Explain how DNA polymerase contributes to the DNA's semi-conservative replication. (2)

.....
.....
.....
.....
.....
.....

I am Sorry !!!!!

4.

(a) Mention the names of the two researchers who put up models for the replication and chemical makeup of DNA. **(1)**

.....

In a test tube, a scientist duplicated DNA. He did this by combining a DNA nucleotide solution, an enzyme, and identical single-stranded DNA pieces.

(b) What enzyme is involved in this DNA replication? **(1)**

.....

(c) Make a suggestion using your understanding of the semi-conservative replication of DNA. **(3)**

1. Single-stranded DNA fragments' function

.....
.....
.....
.....
.....

2. the role of the DNA nucleotides.

.....
.....
.....
.....
.....

5.

(a) Draw and mark one DNA nucleotide. **(2)**

I am Sorry !!!!!

(b) Identify two characteristics of DNA and discuss the role that each play in the semi-conservative replication of DNA. **(2)**

1.....
.....
.....
.....

2.....
.....
.....
.....

(c) Nuclear DNA replication differs from that of mitochondrial DNA (mtDNA).

Only until the first strand of mtDNA has been replicated by two-thirds does the replication of the second strand begin.

The replication rate of one unit of mtDNA, which is 16 500 base pairs long, is 50 nucleotides per second.

Tick (✓) the box that shows how long it would take to copy this mtDNA. **(1)**

A 330 seconds

B 440 seconds

C 550 seconds

D 660 seconds

I am Sorry!!!!

6.

(a) Describe the function of two specific enzymes in the semi-conservative DNA replication process. (3)

.....

.....

.....

.....

.....

.....

.....

(b) Researchers studied the role of cyclin A, a protein found in eukaryotic cells. One of the enzymes necessary for the beginning of DNA replication is hypothesized to be bound by this protein.

The following is how the researchers handled cell culture preparations.

C - Untreated control cells

D - Added antibody that binds cyclin A specifically

E - Added RNA that prevents cyclin from being translated A

F - Added cyclin A protein and RNA that hinders cyclin A translation

They next calculated the proportion of cells in each culture that were actively reproducing DNA.

The table displays their outcomes.

Cell treatment	Percentage of cells where DNA was replicating
C Control	91
D Antibody that binds specifically to cyclin A	11
E RNA that prevents translation of cyclin A	10

F RNA that prevents translation of cyclin A and added cyclin A protein	92
--	----

Provide explanations for the table's outcomes. (3)

.....

.....

.....

.....

.....

.....

.....

.....



DR. ASHAR RANA
M.B.B.S / MS. CHEMISTRY



CHEMISTRY ONLINE
TUITION

Phone: +442081445350
www.chemistryonlinetuition.com
Email: asherrana@chemistryonlinetuition.com

- Founder & CEO of Chemistry Online Tuition Ltd.
- Completed Medicine (M.B.B.S) in 2007
- Tutoring students in UK and worldwide since 2008
- CIE & EDEXCEL Examiner since 2015
- Chemistry, Physics, Math's and Biology Tutor

I am Sorry !!!!!

**CONTACT INFORMATION FOR
CHEMISTRY ONLINE TUITION**

- UK Contact: 02081445350
- International Phone/WhatsApp: 00442081445350
- Website: www.chemistryonlinetuition.com
- Email: asherrana@chemistryonlinetuition.com
- Address: 210-Old Brompton Road, London SW5 OBS, UK

I am Sorry !!!!!