



CHEMISTRY ONLINE
— **TUITION** —

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BIOLOGY

BIOLOGICAL MOLECULES

LEVEL & BOARD:	AQA (A - LEVEL)
TOPIC:	Enzymes
PAPER TYPE:	Solution 1
TOTAL QUESTIONS:	04
TOTAL MARKS:	25

Enzyme - 1

1.

(a) When an enzyme binds its substrate, it forms an enzyme-substrate complex. This complex lowers the activation energy of the reaction and promotes its rapid progression by providing certain ions or chemical groups that actually form covalent bonds with molecules as a necessary step of the reaction process.

(b)

- size / variety of potato
OR
- Temperature of solution
OR
- pH of solution

(c) 0.33, 0.60, 0.86, 1.0, 1.0

(d)

- Hydrogen peroxide concentration on x axis and rate of reaction on Y axis, linear number sequence and appropriate scale
- Correct units /mol dm⁻³ and arbitrary units
- All co-ordinates plotted accurately with point-to-point or smooth curve

(e) Cut up/use discs to homogenise or increase surface area of potato chips.

2.

(a)

- Place sample into test tube and add water to dissolve.
- Add biuret reagent and if a colour happens from blue to purple then proteins are present.

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(b)

Similarities:

All have carboxylic group

All have an amino acid group

Differences:

Variable groups are different

(c)

- Two of the amino acids are polar.
- One is more polar than the other and has a more positive charge as it moves further towards the negative electrode.

3.

(a) Because the separation of the sister chromatids during anaphase is an irreversible step, the cycle will not proceed until all the chromosomes are firmly attached to at least two spindle fibers from opposite poles of the cell.

(b) Cancer cells divide more rapidly and healthy cells divide slowly.

(c) ABZ increases Cyclin B so, mitosis starts but does not end no tumour growth. ABZ lowers ratio of Bcl-2 to Bax so, apoptosis cells die no tumour growth.

(d) In support of suggestion

It stops mitosis at metaphase cell division so no tumour growth

OR

It promotes apoptosis (programmed cell death) so, tumour destroyed.

Against suggestion

Healthy cells are damaged and causes side effects.

4.

(a) Induced-fit model proposing that the binding of a substrate or some other molecule to an enzyme causes a change in the shape of the enzyme so as to enhance or inhibit its activity. Enzymes promote chemical reactions by bringing

substrates together in an optimal orientation, thus creating an ideal chemical environment for the reaction to occur.



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- Founder & CEO of Chemistry Online Tuition Ltd.
- Completed Medicine (M.B.B.S) in 2007
- Tutoring students in UK and worldwide since 2008
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