CHEMISTRY ONLINE
TUITION

Phone: +442081445350

www.chemistryonlinetuition.com

Email:asherrana@chemistryonlinetuition.com

BIOLOGY

THE CONTROL OF GENE EXPRESSION

Level & Board	AQA (A-LEVEL)
TOPIC:	ENERGY
PAPER TYPE:	SOLUTION - 1
TOTAL QUESTIONS	5
TOTAL MARKS	20

Energy - 1

1.

(a) A single molecule of adenosine triphosphate (ATP) is a nucleotide derivative and is formed from a molecule of ribose, a molecule of adenine and three phosphate groups. Hydrolysis of ATP to adenosine diphosphate (ADP) and an inorganic phosphate group (P_i) is catalysed by the enzyme ATP hydrolase.

2.

(b) Adenosine diphosphate and inorganic phosphate

(c)

- Species the muscle tissue came from
- Temperature of the muscle tissue (ATP solution)
- pH of the ATP solution

(d) Description

As concentration of ATP increases, length of muscle decreases.

Explanation

More ATP (hydrolysed by ATP hydrolase), so more energy released, so more muscle contraction / shortening of muscle.

(e)

= 30,500-18,300 = 12200

= 12200/20 = 610

= 610/1000 = 0.61

$= 0.61 \times 8 \times 10^{-6} = 4.88 \times 10^{-6}$ J

3.

(a) $ADP + P_i \longrightarrow ATP + H_2O$

(b) Human ATP synthase has a different shape active site (tertiary structure) to bacterial ATP synthase.

4.

(a)

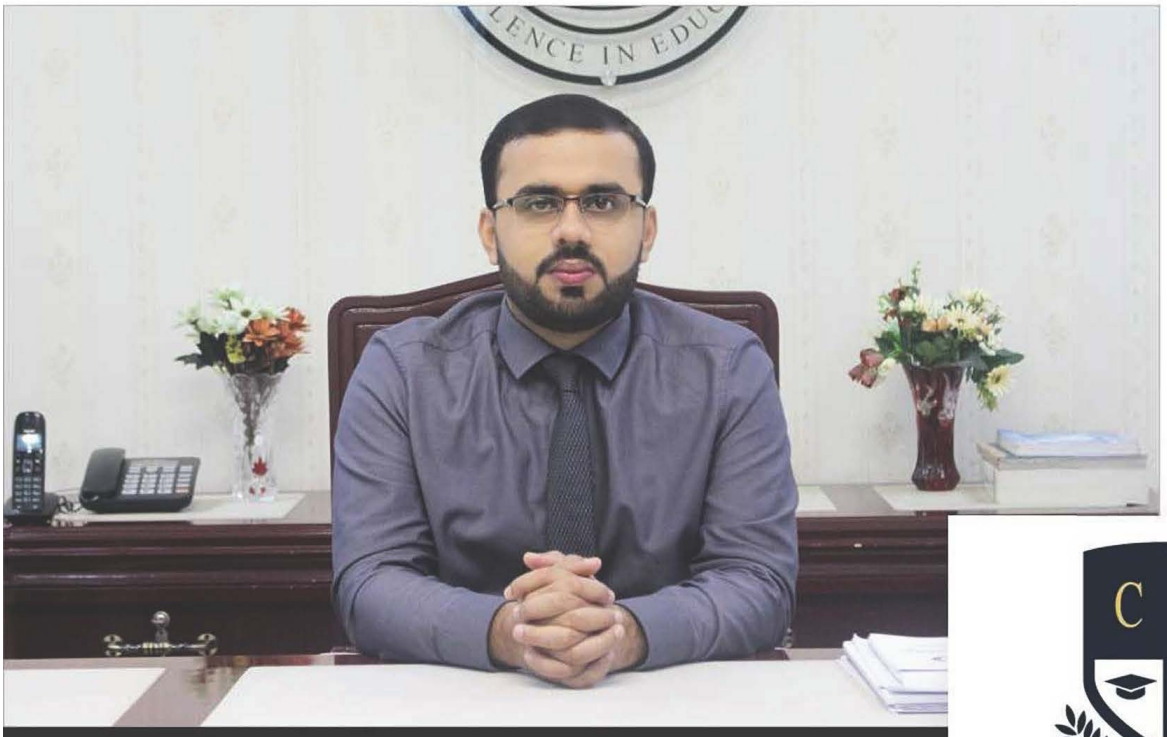
- Releases relatively small amount of energy
- Releases energy instantaneously
- Phosphorylates other compounds, making them more reactive;
- Can be rapidly re-synthesised, does not leave cells

5.

(a) ATP is resynthesized by the condensation of ADP and P_i. This reaction is catalyzed by the enzyme ATP synthase during photosynthesis, or during respiration.

(b)

- To provide energy for active transport across a cell surface membrane.
- To phosphorylate other molecules and make them more reactive.



DR. ASHAR RANA

CHEMISTRY ONLINE TUITION

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

- Founder & CEO of Chemistry Online Tuition Ltd.
- Tutoring students in UK and worldwide since 2008
- CIE & EDEXCEL Examiner since 2015
- Chemistry, Physics, and Math's Tutor

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