

AQA, OCR, Edexcel

A Level

A Level Biology

Synaptic Transmission Answers

Name:

M M E

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Total Marks: /22

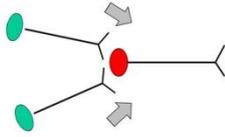
Synaptic Transmission

Answer	Marks
1. A i) Neurotransmitters	1 mark
ii) – presence of the action potential opens the Ca^{2+} channels -causing Ca^{2+} to diffuse in down its concentration gradient - This causes vesicles containing neurotransmitter to fuse to the pre-synaptic membrane -Exocytosis of the neurotransmitter into the synaptic cleft -Neurotransmitter diffuses across the cleft and binds to receptors on the post-synaptic membrane -Sodium channels open -Stimulates an action potential	6 marks
iii) Synapse between a motor neurone and a muscle fibre	1 mark
iv) Breaks down the neurotransmitter - To prevent an action potential from being continually generated	2 marks

<p>b) i) - hyperpolarises the membrane, which makes it harder to excite -reducing the probability of transmission of an action potential</p> <p>ii) Nicotine: More action potentials are generated</p> <p>GABA - the membrane becomes hyperpolarised, this makes it harder to excite and reduces the number of action potentials generated</p> <p>Nerve gas - prevents the neurotransmitter from being removed from receptors in the post-synaptic membrane - action potentials are continually generated</p>	<p>2 mark</p> <p>3 marks</p>
<p>2. a) i) The stimulus must be over a certain strength to generate an action potential.</p>	<p>1 mark</p>

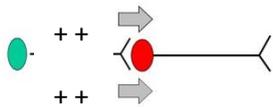
ii) **Spatial Summation:**

- Many neurones release neurotransmitters to one neurone
- Combined this is enough to reach the threshold



Temporal Summation:

- Numerous impulses arrive in quick succession along the axon
- Combine they are enough for threshold to be reached and the neurotransmitter to be released



6 marks