AQA, OCR, Edexcel

A Level

A Level Biology

Synaptic Transmission Answers

Name:

M M E

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Total Marks: /22

Synaptic Transmission

Neurones are not continuous; where one neurone ends and another begins there is a small gap, this gap is called a synapse.

1. The action potential travels continuously along an axon through the movement of sodium and potassium ions. However a different mechanism evolved to help cross the synapse.

a) i) What name is given to chemicals which diffuse across synapses?

(1 mark)

ii) Explain the process that occurs from when the action potential reaches the pre-synaptic knob to transmission in the next neurone.

(6 marks)

iii) Where is a neuromuscular junction found? (1 mark)

iv) Explain the importance of enzyme action in synaptic transmission?

(2 marks)

b) Neurotransmitters can be excitatory or inhibitory.

i) How does an inhibitory neurotransmitter such as Serotonin work?

(2 marks)

ii) Some drugs affect the function of neurotransmitters in synapses. Complete the table below to identify the effect each drug has on action potential generation and why. (3 marks)

Drug Interaction	Effect on Synaptic Transmission
Nicotine mimics the shape of dopamine	
GABA attaches to a receptor on the post synaptic membrane and allows an influx of Cl^-	
Nerve gas inhibits acetylcholinesterase	

2. The strength of a stimulus determines the amount of neurotransmitter released into the synaptic cleft.

i) What is meant by the term 'threshold value'? (1 mark)

b) Summation is a mechanism that ensures the threshold level is achieved.

i) Explain the difference between the two types of summation with the aid of diagrams. (6 marks)