Homeostasis in mammals

Question Paper 4

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Homeostasis
Sub Topic	Homeostasis in mammals
Booklet	Theory
Paper Type	Question Paper 4

Time Allowed : **60 minutes**

Score : **/ 50**

Percentage : **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1 **(a)** Explain how a synapse functions. [9]

(b) Describe the role of glucagon in regulating blood glucose. [6]

[Total: 15]

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2 **(a)** Neurones transmit impulses from one part of a mammal's body to another.

The table contains statements that refer to motor and sensory neurones.

Complete the table, indicating with the letters **M**, **S** or **B**, whether each statement applies to:

- motor neurones only (**M**)
- sensory neurones only (**S**)
- both motor and sensory neurones (**B**).

The first one has been done for you.

statement	**letter**
is myelinated	**B**
may form a synapse with an intermediate (relay) neurone	....
cell body lies within the CNS	....
dendron is usually longer than axon	....
cell body lies within spinal nerve	....
has many dendrites	....

[3]

(b) A synapse is a junction between two or more neurones.

Describe how an action potential arriving at a presynaptic membrane of a neurone can result in the depolarisation of the membrane of a post-synaptic neurone.

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....[5]

(c) Acetylcholinesterase is an enzyme found in the synaptic cleft.

Outline the role of acetylcholinesterase.

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....[2]

[Total: 10]

3 **(a)** Describe the role of hormones in the maintenance of the human menstrual cycle. [9]

(b) Explain the principles of homeostasis in humans. [6]

[Total: 15]

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4 Fig. 6.1 is a trace that shows the changes that occur in the membrane potential of a neurone during an action potential.

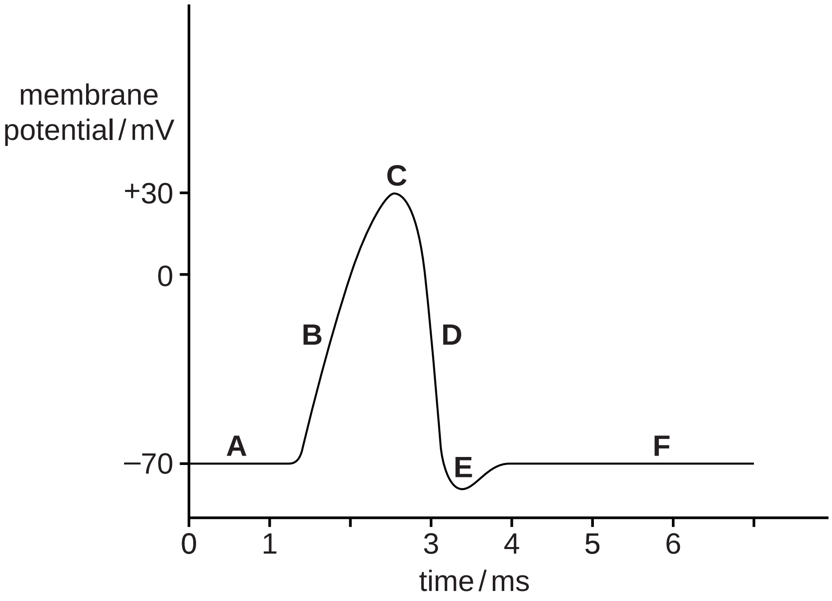

Fig. 6.1

(a) Using the letter(s) **A** to **F** from Fig. 6.1, state which letter(s) corresponds to the following:

(i) depolarisation ....

(ii) hyperpolarisation ....

(iii) the membrane is most permeable to potassium ions ....

(iv) resting potential .... [4]

(b) Saxitoxin is a powerful poison produced naturally by single-celled, eukaryotic, photosynthetic, marine organisms. Shellfish may consume organisms containing saxitoxin but are unaffected. If humans were to eat shellfish containing saxitoxin they would become very ill and may die.

(i) State the kingdom to which the organisms that produce saxitoxin belong.

.... [1]

(ii) Saxitoxin blocks sodium ion channels in the cell surface membranes of neurones.

Describe the role of sodium ion channels in the transmission of a nerve impulse.

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....[3]

(iii) Suggest why saxitoxin may be fatal to humans.

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....[2]

[Total: 10]