

AQA, OCR, Edexcel

A Level

A Level Biology

**The Nervous System 2
Questions**

Name:

M M E

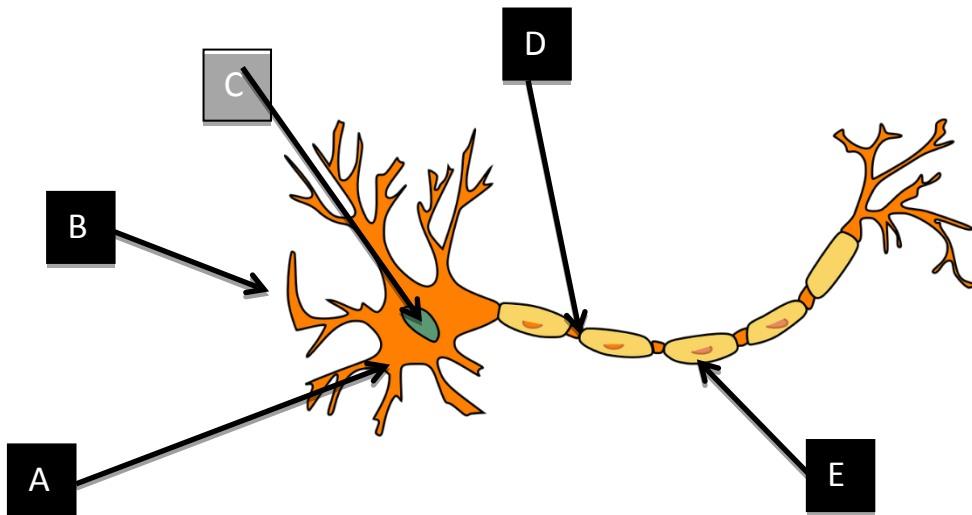
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Total Marks: /31

The Nervous System 2

1. When cell membranes are at rest they are polarised; there is a difference in the voltage across the membrane.

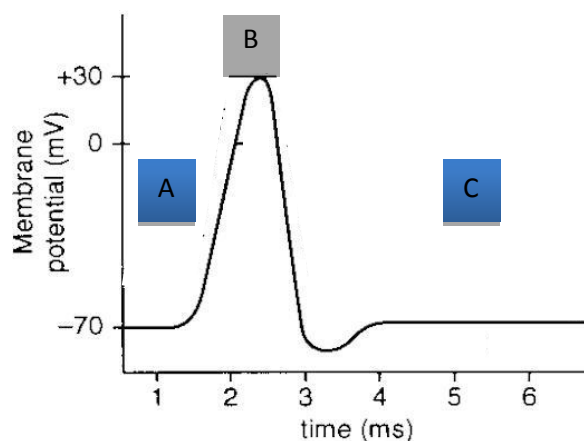
a)i) Label the diagram of the nerve cell below and identify the direction that the nerve impulse travels. (6 marks)



ii) How is the resting potential of the membrane achieved? (4 marks)

iii) Why can't sodium ions diffuse back into the cell? (1 mark)

- b) The graph below shows the changes in potential difference across the membrane during an action potential.



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- i) Explain what is happening at point A on the graph. (4 marks)
 - ii) Explain, what is happening in terms of the cell membrane and integral membrane proteins between points B and C. (3 marks)
2. Action potentials have a number of important features and neurones are adapted so that impulses are transported as fast as possible.
- i) Explain the process of salutatory conduction. (4 marks)
 - ii) Multiple Sclerosis is a disease that affects Schwann cells.
What effect does this have on the transmission of action potentials? (2 marks)
 - iii) How does axon diameter and temperature affect the speed of conductance in the axon? (2 marks)
 - iv) Explain the term 'refractory period' referring to both the absolute and relative states? (3 mark)
3. Explain the all or nothing principle for nerve impulse transmission? (2 marks)