

NAME: .....

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## S.6 BIOLOGY P1 ASSESSMENT TEST THREE 2023

DURATION: 90 MINUTES

TOPIC: COORDINATION IN ANIMALS &amp; GROWTH &amp; DEVELOPMENT

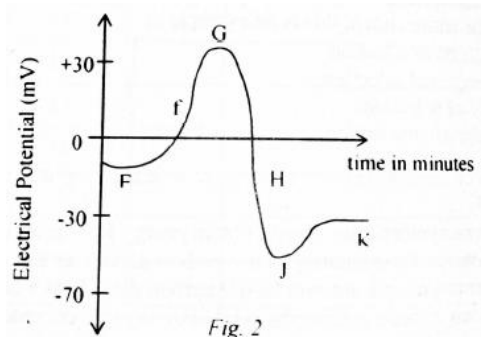
INSTRUCTIONS: *Section A is compulsory and Attempt any three questions in section B.*

## SECTION A

1. A person who has significant learning problems may have a defect with  
 A. Medulla oblongata  
 B. Hypothalamus  
 C. Cerebellum  
 D. Cerebrum
2. Table 1 below show differences in actions of the sympathetic and parasympathetic systems. Which one of the pairs is incorrect?

	Sympathetic system	Parasympathetic system
A	Accelerates heart beat	Slows heart beat
B	Dilates pupil of eye	Constricts pupil of eye
C	Contracts bladder	Relaxes bladder
D	Constricts arterioles in skin of limbs	Dilates arterioles in skin of limbs.

3. Hormones are present in minute concentrations yet they have large effects on target cells and on the individual as a whole. This is possible because a single hormone molecule can  
 A. bind irreversibly to its receptor  
 B. bind to many receptors at once  
 C. initiate transcription of DNA by binding to cell surface receptors  
 D. activate many intracellular enzymes
4. Figure 2 below shows the pattern traced by placing electrodes at a point on the axon of a nerve cell, as it is stimulated.



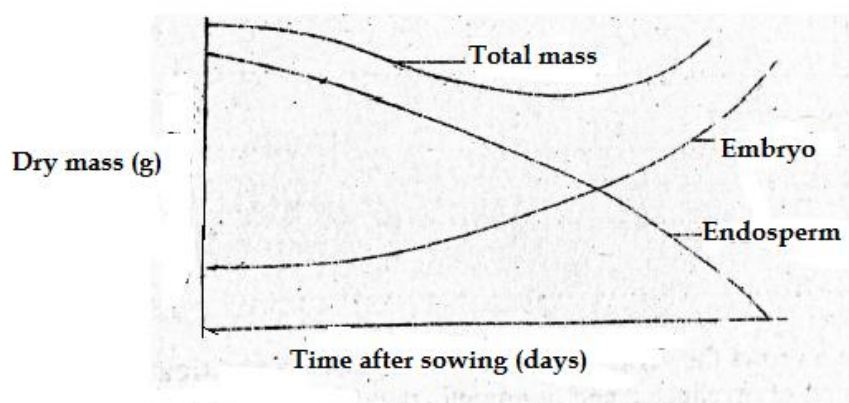
From figure 2, it can be concluded that;

- A. The lowest potential J, represents the resting potential of the nerve.
- B. During phase F, fewer sodium ions are leaving the cell than entering it.
- C. During phase K, the membrane will fail to respond to further stimulation.

- D. The stimulus applied only has an effect when the membrane potential is positive.
5. A period of reduced metabolism to a minimum in insects is referred to as;  
 A. Hibernation C. Aestivation ☐  
 B. Diapause D. Gonochorism
6. Increased permeability of a postsynaptic membrane to allow chloride ions in, and potassium ions out of the cell causes.  
 A. Depolarization of the cell membrane ☐  
 B. Polarization of the membrane  
 C. Excitation of the membrane  
 D. Hyper polarization of the membrane
7. Some seeds may germinate when exposed to a period of cold treatment. This is known as.  
 A. Vernilisation C. Stratification ☐  
 B. Photoperiodism D. Dormancy
8. Dry weight is the best method of estimating growth in an organism because it,  
 A. Does not involve destroying the organism ☐  
 B. Is easier to determine.  
 C. Neither increases nor decreases  
 D. Is constituted of weight of the protoplasm synthesized
9. The first physical process that occurs during seed germination involves ☐  
 A. Imbibition C. Active transport  
 B. Osmosis D. Diffusion
10. Which of these describes development? ☐  
 A. Cells divide and become large  
 B. Cells become specialized in structure and function  
 C. Body parts are shaped and patterned into a specific form.  
 D. Organs and systems form.

### SECTION B

1. Figure below shows changes in dry mass of embryo, endosperm and total mass of maize seeds germinating in light conditions.



(a) Explain the changes in relative dry mass of the

(i) Endosperm

(03 marks)

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(ii) Embryo

(02 marks)

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(b) Explain why the total dry mass of the seedlings initially decreases then later increases.

(02 marks)

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(c) Suggest with reasons, what would happen to the total dry mass of the seedlings if the seeds were mass germinated in the dark.

(03 marks)

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2. (a) What is meant by apical dominance?

(02 marks)

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(b). State the causes of each of the following

(i) Apical dominance

(02 marks)

(ii). Seed dormancy

(02 marks)

(a) What is the ecological importance of

(i) Apical dominance?

(02 marks)

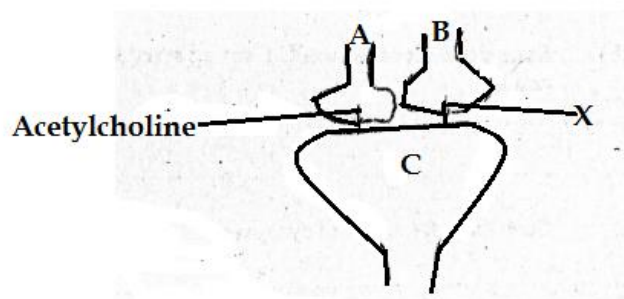
(ii) Seed dormancy?

(02 marks)

3. (a) Distinguish between Growth and Development (02 marks)

(b) Suggest five ways by which dormancy may be broken. (05 marks)

4. Figure below shows dendrites from neurons A and B forming synapses with neuron C.



(a) Explain what would happen if

- (i) Acetyl choline increased the permeability of the postsynaptic membrane to  $\text{Na}^+$  ions. (03 marks)

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- (ii) X increased the permeability of the postsynaptic membrane to  $\text{Cl}^-$  ions. (03 marks)

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- (b) State a benefit of neuron C forming synapses with two neurons A and B. (01 mark)

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- (c) State six functions of synapses (06 marks)

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5. Describe the state of the voltage-gated ion channels during the;  
(a) (i) resting state (02 marks)

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- (ii). beginning of depolarisation (02 marks)

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- (iii). beginning of repolarization. (02 marks)

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(iv). hyperpolarisation (02 marks)

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(b) Give four characteristics of receptors. (04 marks)

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6. (a) What is meant by the term refractory period (05 marks)

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(b). Explain how refractory period ensures that nerve impulses are kept separate from one another (03 marks)

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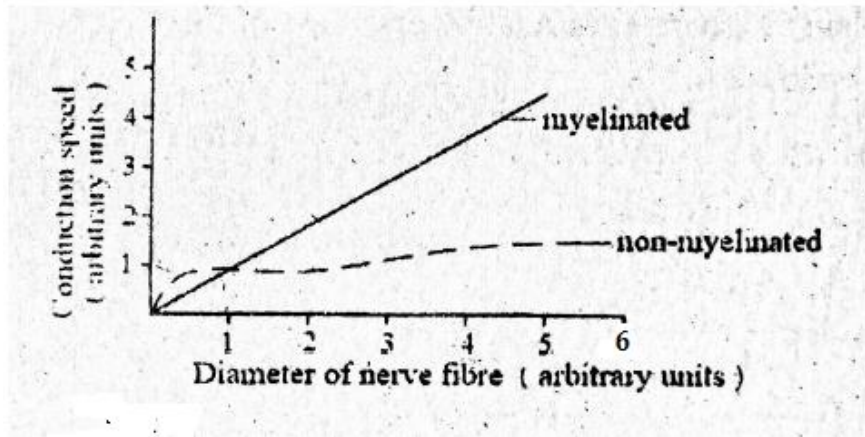
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(c). Give two other importances of refractory period in impulse transmission. (02 marks)

7. Figure below shows the variation of a nerve impulse conduction speed with total diameter, of myelinated and non-myelinated fibres.



- (a) Compare the variation of speed of conduction with diameter in the two types of fibres (04 marks)

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- (b) Explain the difference in the conduction speed of the two fibres. (02 marks)

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- (c) Suggest the significance of transmission speed in nervous communication.

(04 marks)

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**End!!!**  
**“Hard work pays!!!!”**