The City School

Unified Mid-Year Examinations
2018 - 2019
Class 10

SCHOOL NAME	
INDEX NUMBER	
DATE	

BIOLOGY **5090/22**
Paper 2 Theory **1 hour 45 minutes**

Candidates answer on the Question Paper.
No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your School name, Index number and Date in the spaces provided.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use paper clips, glue or correction fluid.

Section A
Answer **all** questions in this section.
Write your answers in the spaces provided on the Question Paper.

Section B
Answer **both** questions in this section.
Write your answers in the spaces provided on the Question Paper.

Section C
Answer **either** question 8 or question 9.
Write your answers in the spaces provided on the Question Paper.

You are advised to spend no longer than one hour on Section **A**.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

The number of marks is given in brackets [ ] at the end of each question or part question.

Invigilated By: _____ Checked By:_____ Marks Tallied By: _____

This document consists of **12** printed pages.

Section A

Answer **all** the questions in this section.

1 **(a)** State three substances found in the urine of a healthy person.

1 .....

2 .....

3 ..... [3]

(b) The concentration of a person's urine can vary according to their diet.

Explain how changes in a person's diet can affect the concentration of their urine.

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..... [4]

(c) An investigation was carried out into the effect of diet on the rate of production of urine. Three students each took 1.5 dm3 of a different drink A, B or C.

Fig. 1.1 shows the volume of urine released by each student over the next two and a half hours.

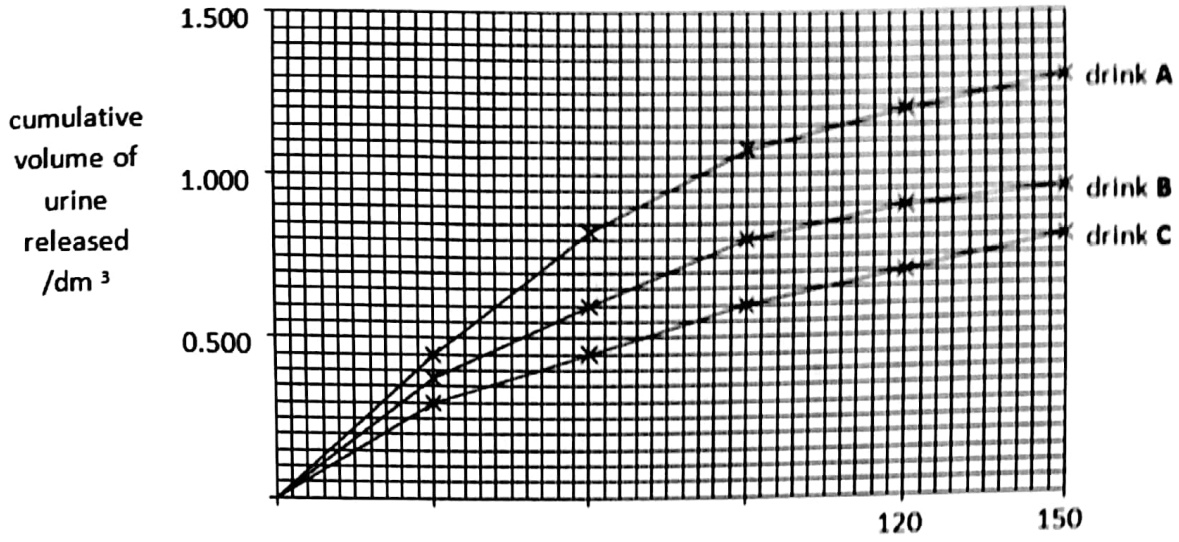

Fig 1.1

Suggest which of the three drinks it would be better to avoid on a very hot day.

Give an explanation for your answer.

drink ..... [1]

explanation .....

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..... [4]

[Total: 12]

2 **(a)** Receptors receive stimuli and convert them into electrical impulses.

Fig. 2.1 shows the pathway taken by electrical impulses in a reflex action.

Complete Fig. 2.1 by writing the name of the appropriate component on the lines.

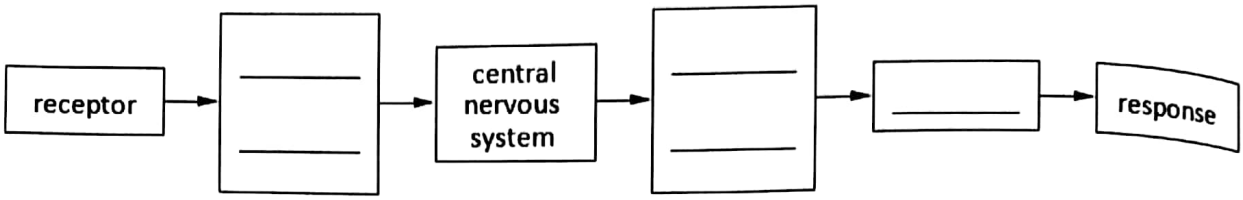

Fig 2.1

[2]

(b) The brain is one part of the central nervous system. Fig. 2.2 is a diagram of the human brain

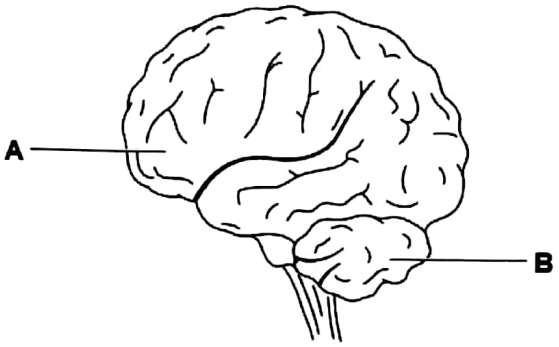

Fig 2.2

Damage to the brain can sometimes occur as the result of an accident.

Name the parts of the brain labelled A and B in Fig. 2.2 and suggest a problem that may be experienced by a person who has damage to that part of the brain.

part **A** .....

problem caused by damage .....

.....

part **B** .....

problem caused by damage .....

..... [4]

(c) Fig. 2.3 shows the pathway of a nerve impulse.

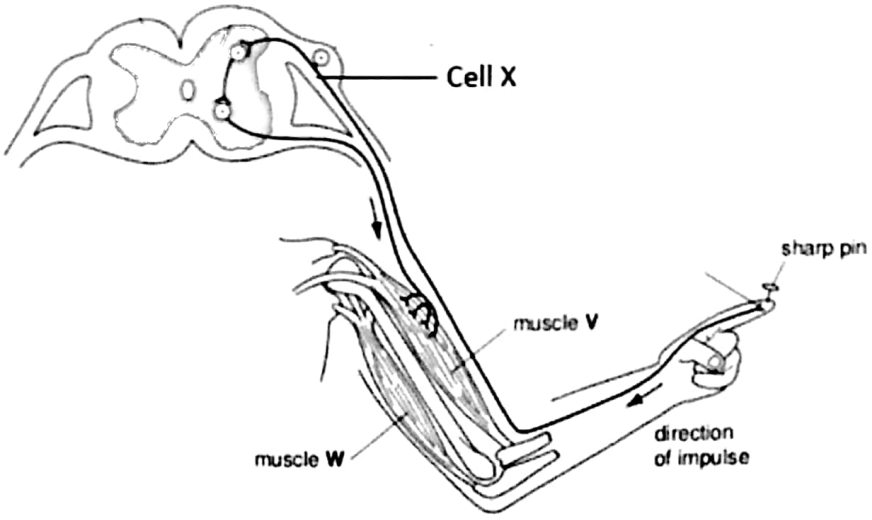

Fig. 2.3

(i) Name cell X and state its function.

Name .....

Function ..... [1]

(ii) List components of this reflex arc.

..... [2]

(iii) With reference to muscle V and muscle W labeled in Fig. 2.3, describe the movement at the elbow joint.

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..... [2]

[Total: 11]

3 The following is a list of terms associated with a person's responses. Each term is identified by a letter.

A – brain F – motor neuron

B – contraction G – muscle

C – gland H – receptor

D – hormone I – sensory neuron

E – impulse J – spinal cord

(a) Using their identifying letters only, place the terms in the order in which they are involved in the following:

(i) Peeling an onion causes a student's eyes to water.

.....[2]

(ii) A student decides to open a book.

.....[1]

(iii) A student hears a sudden loud noise and, shortly afterwards, his heart beats faster.

.....

.....[2]

(b) Name the types of responses involved in (a)(i) and (a)(ii).

(a)(i) .....

(a)(ii) ..... [2]

(c) Describe how responses involving the nervous system differ from those that involve the effects of hormones.

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..... [3]

[Total: 10]

4 Fig. 4.1 shows a horizontal section of the human eye and the pathway taken by light rays as they leave an object.

(a) Complete the diagram by continuing the lines from the object to show how the light rays produce a focused image on the retina.

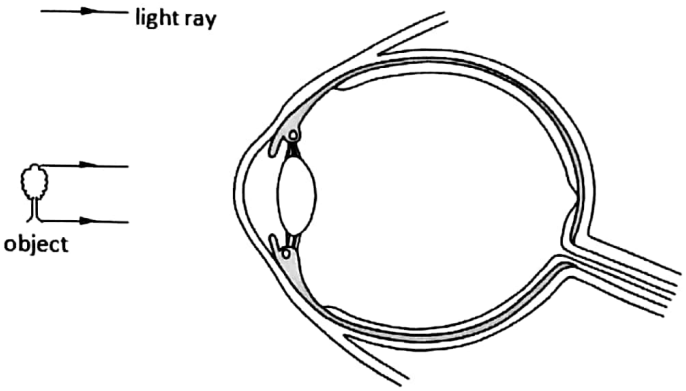

Fig. 4.1

[3]

(b) (i) State how the appearance of the pupil in the eye will change when a person moves from dim light into an area of bright light.

..... [1]

(ii) Explain how this change is brought about by structures in the eye.

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..... [2]

(c) The change in appearance of the pupil when entering an area of bright light is a reflex action.

(i) Define the term reflex action.

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..... [2]

(ii) Suggest why drugs that prevent this reflex action from occurring should be avoided.

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..... [2]

[Total: 10]

5 Fig. 5.1 shows a section through human skin

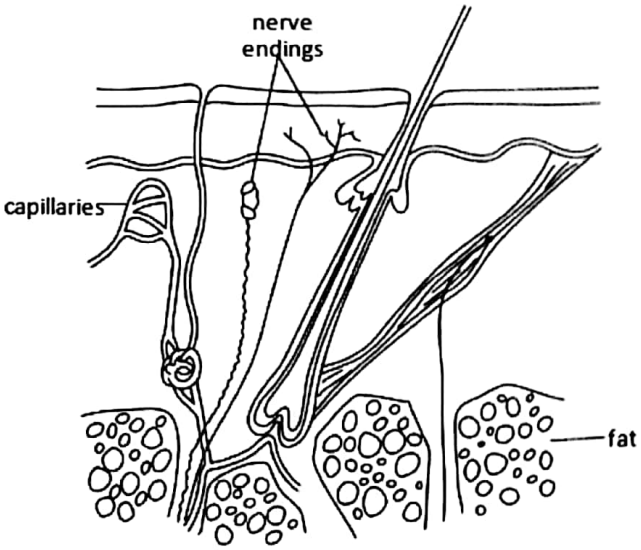

Fig. 5.1

(a) Suggest two possible functions of the nerve endings shown in Fig. 5.1.

1 .....

2 ..... [2]

(b) Explain how the capillaries are involved in the loss of heat from the body during exercise.

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..... [3]

(c) Fig. 5.2 shows a yak. The yak is a large animal that lives at high altitudes (up to 5 500 m).

Suggest why the sweat glands of this animal are largely non-functional.

Fig. 5.2

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..... [2]

[Total: 7]

Section B

Answer **both** questions in this section.

6 **(a)** Explain what is meant by a hormone.

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..... **[4]**

(b) Give an example of a hormone and describe how it is involved in maintaining constant conditions within the human body.

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..... **[6]**

[Total: 10]

7 **(a)** A person looks up from focusing on a near object to focus on an object further away. Describe how changes that take place in named components of the person's eye produce a focused image of the distant object.

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..... [6]

(b) Suggest why these changes that take place in the eye are controlled by the nervous system, rather than by a hormone.

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..... [4]

[Total: 10]

Section C

Answer **either** question 8 or question 9.

8 (a) Explain the concept of control by negative feedback.

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..... **[5]**

(b) Describe the movement of bones at the elbow joint.

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..... **[5]**

[Total: 10]

9 **(a)** Describe the removal of excretory products from the human body.

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..... [8]

(b) Explain why the removal of faeces from the body is not regarded as excretion.

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.....[2]

[Total: 10]