The City School

Unified Mid-Year Examination
2016 - 2017
CLASS 10

CANDIDATE NAME

INDEX NUMBER | | | | | |

DATE: _____

BIOLOGY **5090/22**
Paper 2 Theory **1 hour 30 minutes**

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

READ THESE INSTRUCTIONSFIRST

Write your Name, Index number on all the work you hand in.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working
Do not use staples, paper clips, highlighters, and glue or correction fluid.

Answer **all** questions in Section A and B.
Write your answers in the spaces provided on the Question Paper.
Answer any **One** question in Section C.

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

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **14** printed pages

SECTION A

1 Fig. 1.1 shows the main bones of a human forelimb.

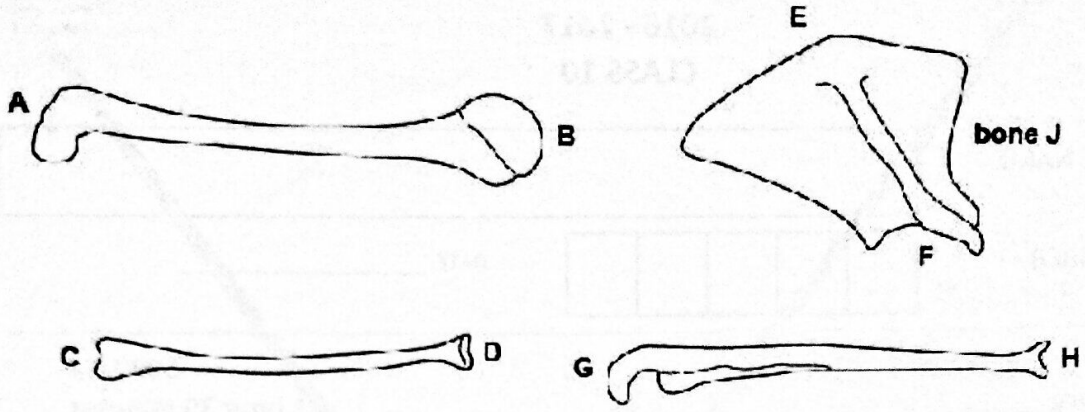

Fig. 1.1

(a) Identify bone J. ..... [1]

(b) By using the letters A to H from Fig. 1.1, write down which parts of the bones meet at each of the following:

(i) the shoulder, ... [2]

(ii) the elbow. ..... [2]

(c) Damaged joints may be replaced with metal or plastic.

Fig. 1.2 shows a replacement joint in a person's arm.

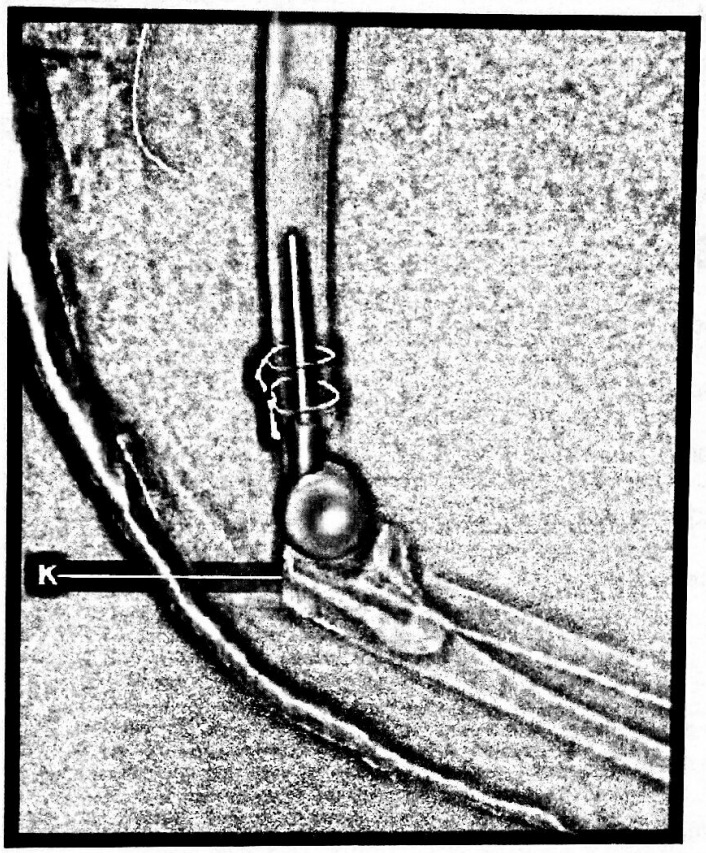

Fig. 1.2

(i) State the type of movement allowed by the joint that has been replaced.

.....

(ii) There is a structure that attaches a muscle to point K in Fig. 1.2. Name this structure and explain its importance in the movement of the forearm.

name of structure .....

importance

.....

.....

[5]

[Total: 10]

(c) Fig. 2.1 shows the blood glucose concentrations of three different people, **G**, **H** and **I**, over a 48-hour period.

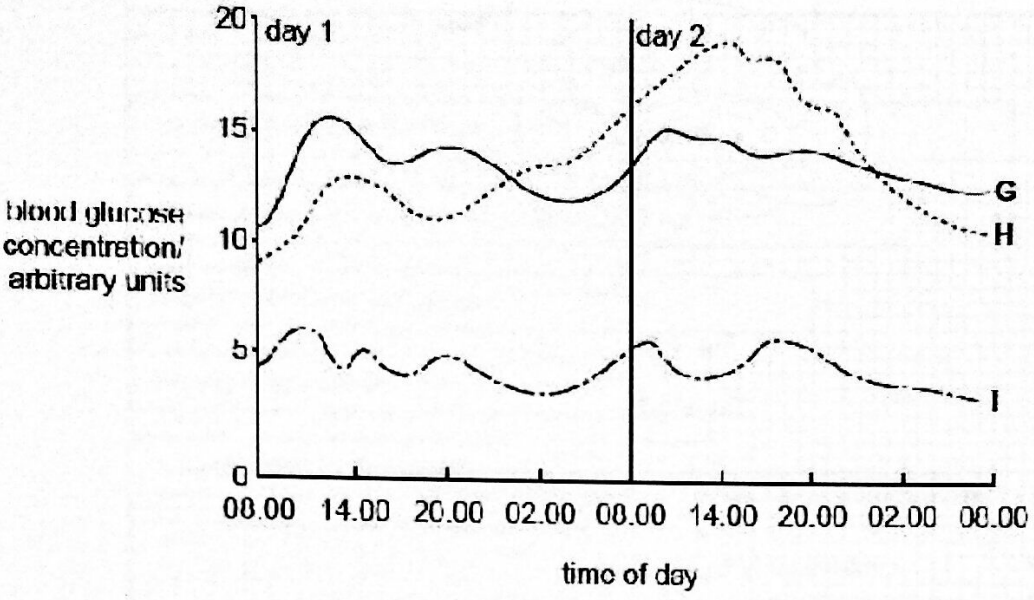

Fig. 2.1

Two of the people are diabetic. The pancreas of one of these produces small quantities of insulin. In the other, the pancreas produces no insulin. The third person is **not** diabetic.

Using the information in Fig. 2.1 and giving a reason for your answer in each case, identify

(i) the person without diabetes .....

reason: .....

(ii) the person who produces no insulin .....

reason: .....

[4]

(d) Diabetes can be treated by injection of insulin. Insulin can now also be taken by breathing it in. Suggest how insulin taken by breathing it in enters the blood.

.....

.....

.....[2]

Total [10]

3 Fig. 3.1 shows a diagram of the human brain and Table 3.2 shows the functions of some parts of the brain

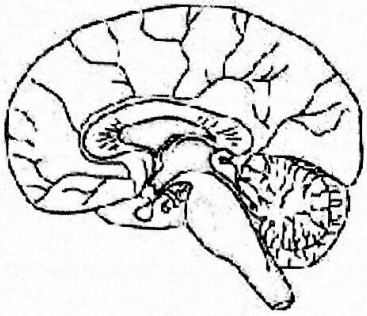

Fig. 3.1

Table 3.1

part of brain	function
P	controls body temperature
Q	is the master hormone-producer
R	controls unconscious activities such as heart-beat
S	helps to control balance and give co-ordination
T	memory storage and conscious behaviour

(a) Label Fig. 3.1 using the letters P to T from Table 3.1. [5]

(b) One of the hormones produced by Q regulates growth and the development of the reproductive organs.

(i) Explain how a hormone made in the brain can have its effect in the reproductive organs.

.....

.....[2]

(ii) Suggest possible effects on a child of the region Q producing unusually high amounts of this hormone.

.....

.....

.....[3]

Total [10]

4 Fig. 4.1 shows the average sweating rates of a person over a 4-hour period under different conditions.

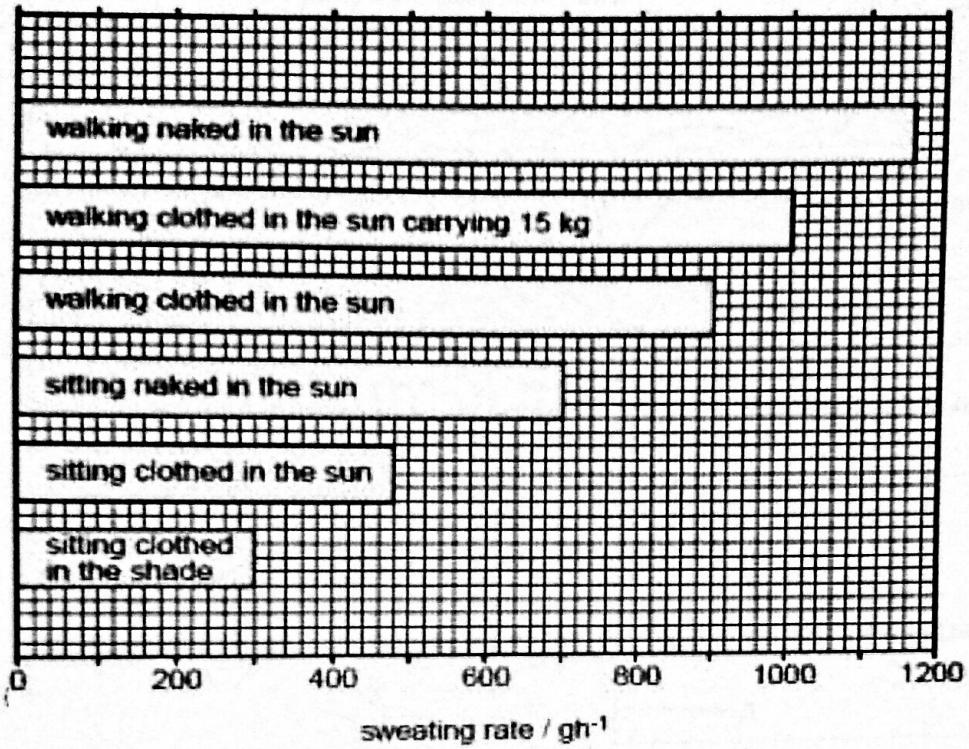

Fig. 4.1

(a) State two ways **other than** by **sweating** in which a person might lose water.

1. .....

2. .....[2]

(b) State and explain how the rates of sweating shown in Fig. 4.1 are **different** for the person when they are

(i) walking and sitting,

.....

.....

(ii) clothed and unclothed,

.....

.....

(iii) in the sun and in the shade.

.....

[6]

(c) Suggest an explanation for the effect that carrying 15kg has on the person's rate of sweating.

.....

.....[2]

[Total 10]

SECTION B

5 Fig. 5.1 shows a pair of kidneys and some associated structures.

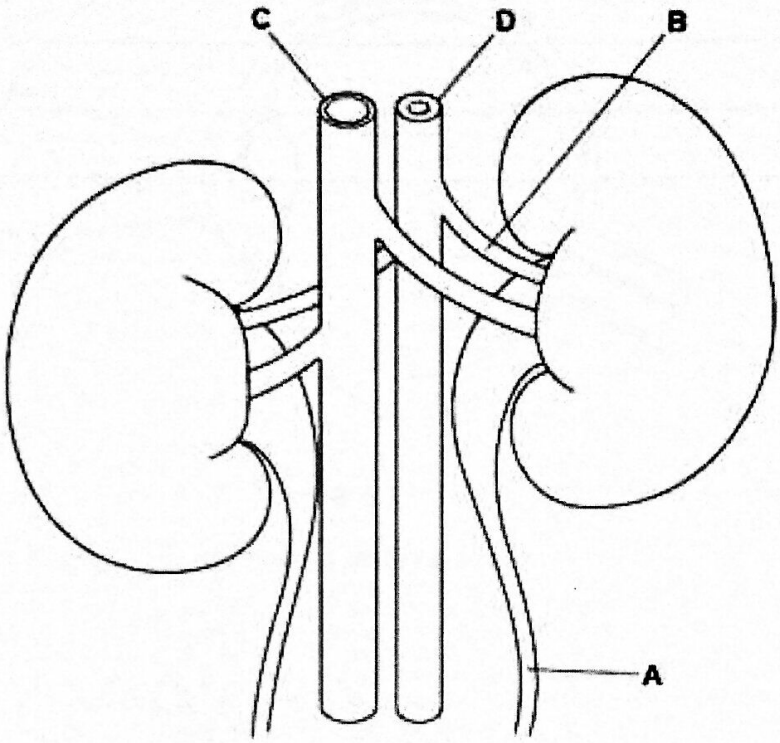

Fig. 5.1

(a) (i) Identify structure **A** in Fig. 5.1

.....

[1]

(ii) Peristalsis occurs continually in structure **A**. Describe and explain how this helps the structure to carry out its function.

.....

.....

..... [3]

(b) Identify structure **B** on Fig. 5.1 and state how the structural features of **C** and **D** enabled you to make your identification.

structure **B** .....

structural features of **C** and **D** .....

..... [3]

(c) On a hot day, a person consumed **only** meat before a day of energetic work. Explain the likely changes in the composition of the person's urine during the day.

.....

.....

.....

..... [3]

[Total: 10]

6. Fig. 6.1 shows the human eye in horizontal section.

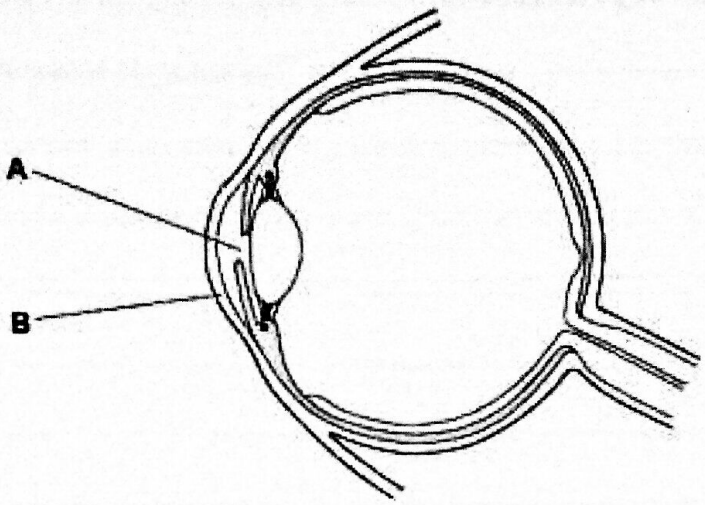

Fig. 6.1

(a) (i) Identify **A** and **B** that are labelled on Fig. 6.1.

A .....

B ..... [2]

(ii) Describe what happens to **A** when light entering the eye becomes less intense.

.....

..... [1]

(iii) Place a letter **Z** on Fig. 6.1 where a response occurs as a result of a reflex action. [1]

(b) In some people's eyes, the retina becomes completely detached from the tissues beneath. Explain how this will affect their ability to see.

.....

.....

.....

.....

..... [3]

(c) As people get older, cloudy (opaque) patches sometimes form in the lens of the eye. These are called cataracts.
Suggest how cataracts might affect the ability of the lens to carry out its function

.....

.....

.....

..... [3]

[Total: 10]

SECTION C

Answer Question 7 OR Question 8

7 (a) Describe the functions of the kidneys.

.....

.....

.....

.....

.....

.....[4]

(b) Describe and explain the ways in which a person may be kept alive even when both of their kidneys have stopped functioning.

.....

.....

.....

.....

.....

.....

.....[6]

[Total: 10]

8. **(a)** Define a *hormone*.

.....

.....

.....

.....

.....

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

(b) Describe how the nervous system is involved in producing a named reflex action.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

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

[Total: 10]