

Craigie High School

National 5 Biology

Unit 2

Multicellular Organisms

Ink Exercise Three

Control and Communication

Name: _____

Class: _____

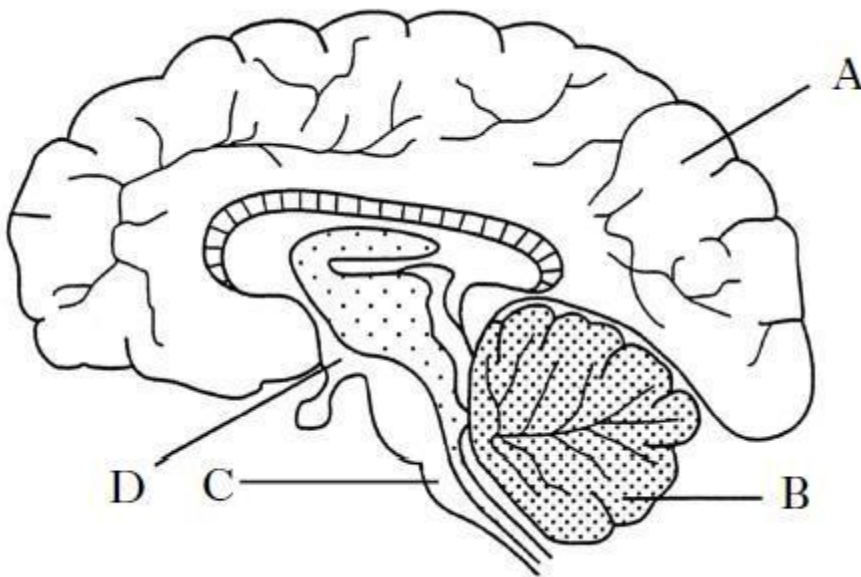
1. Which of the following are the components of the central nervous system (CNS)?
 - a) Brain and neurons
 - b) Neurons and spinal cord
 - c) Brain and spinal cord
 - d) Brain only

2. The list below refers to stages in the response of the nervous system to a stimulus.

- 1 Central nervous system sorts information
- 2 Nerve impulses sent to muscles
- 3 Nerve impulses sent to central nervous system
- 4 Senses detect the stimulus
- 5 Response is produced

The correct order of the stages is

- a) 4 → 3 → 1 → 2 → 5
 - b) 3 → 4 → 2 → 1 → 5
 - c) 4 → 3 → 2 → 1 → 5
 - d) 3 → 4 → 1 → 2 → 5
-
3. The diagram below shows the human brain



Which letter shows the site that controls heart rate and breathing rate?

4. The cerebellum
 - a) Is responsible for conscious thoughts
 - b) Co-ordinates muscles and balance
 - c) Controls heart and breathing rate
 - d) Detects change in water content

5. The following stages occur in a reflex action.
 - 1 The effector produces a response.
 - 2 A sense organ is stimulated.
 - 3 An impulse passes along a sensory neurone.
 - 4 An impulse passes along a motor neurone.

The correct order of the stages is

- a) 2, 3, 4, 1
- b) 2, 1, 4, 3
- c) 1, 2, 3, 4
- d) 3, 4, 1, 2.

6. The key below can be used to identify carbohydrates

- 1 Soluble.....2
Insoluble..... glycogen
- 2 Benedict's test positive3
Benedict's test negative..... sucrose
- 3 Barfoed's test positive4
Barfoed's test negative lactose
- 4 Clinistix test positiveglucose
Clinistix test negative fructose

Which line in the table of results below is **not** in agreement with the information contained in the key?

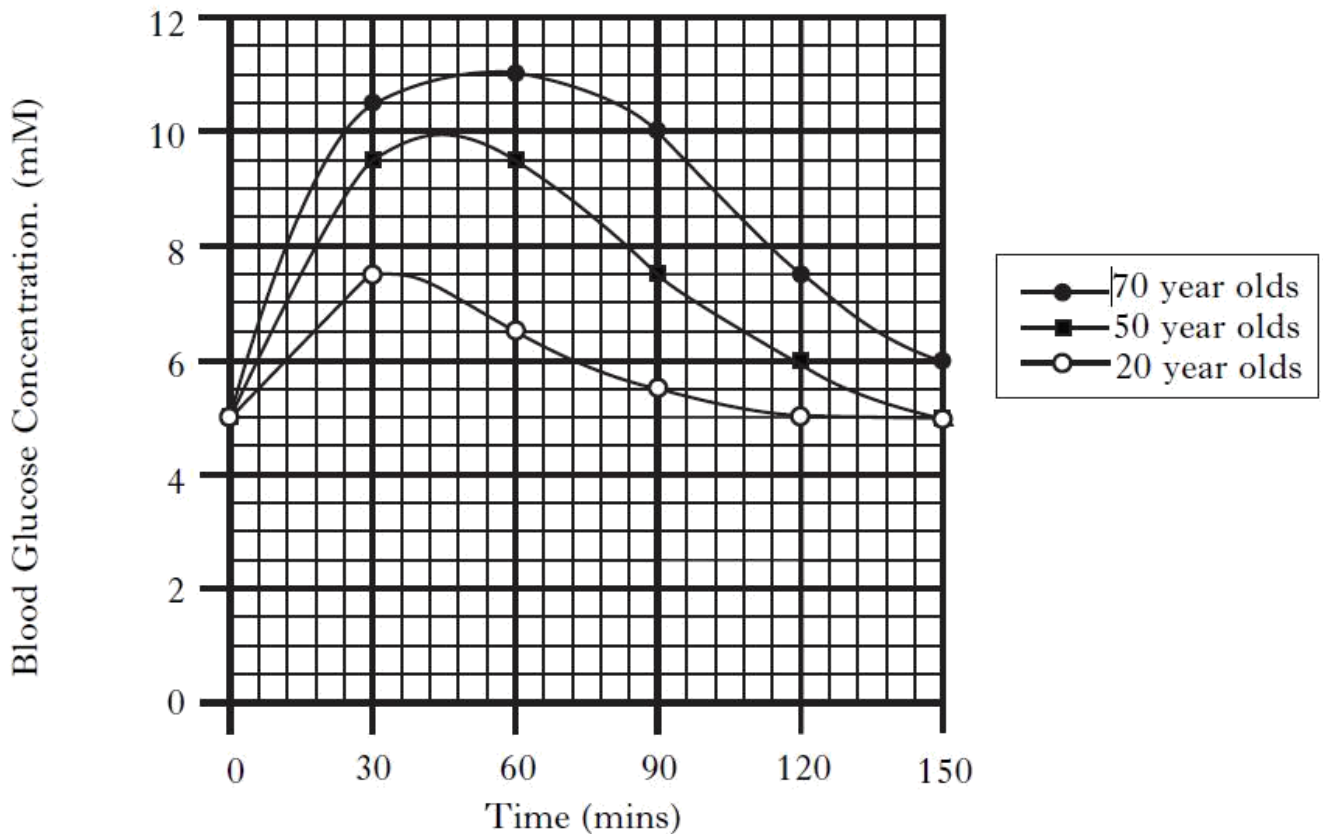
	<i>Carbohydrate</i>	<i>Benedict's test</i>	<i>Barfoed's test</i>	<i>Clinistix test</i>
A	Lactose	Positive	Negative	Not tested
B	Glucose	Positive	Negative	Positive
C	Fructose	Positive	Positive	Negative
D	Sucrose	Negative	Not tested	Not tested

7. Which line in the table below identifies correctly the hormones which stimulate the conversion of glucose and glycogen?

	<i>glycogen</i> → <i>glucose</i>	<i>glucose</i> → <i>glycogen</i>
A	Glucagon and adrenalin	Insulin
B	Adrenalin	Glucagon and insulin
C	Insulin	Adrenalin And glucagon
D	Glucagon and insulin	Adrenalin

8. High levels of blood glucose can cause clouding of the lens in the human eye. Concentrations above 5.5 mM are believed to put the individual at a high risk of lens damage.

In an investigation, people of different ages each drank a glucose solution. The concentration of glucose in their blood was monitored over a number of hours. The results are shown in the graph below.



For how long during the investigation did 20 year olds remain above the high risk blood glucose concentration?

- a) 84 mins
- b) 90 mins
- c) 120 mins
- d) 148 mins

9. Which of the following shows correct responses to changes in sugar concentration in the blood?

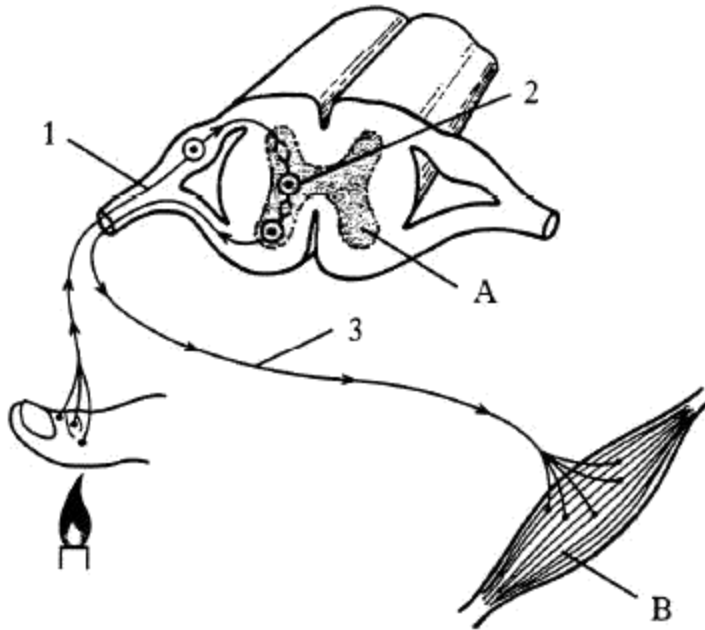
	<i>Sugar concentration in blood</i>	<i>Glucagon secretion</i>	<i>Insulin secretion</i>	<i>Glycogen stored in liver</i>
A	Increases	Decreases	Increases	Increases
B	Increases	Decreases	Increases	Decreases
C	Decreases	Increase	Decreases	Increase
D	Decreases	Decreases	Increases	Decreases

10. The graph below shows the changes which occur in a body's food stores during four weeks of food deprivation

Which of the following conclusions can be drawn from the graph?

- a) The glycogen food store decreases at the fastest rate during week one
- b) Between weeks three and four the body gains most energy from protein
- c) Each food store decreases at a constant rate during week one
- d) Between weeks one and four the body only gains energy from lipid and protein

11. The diagram below shows some of the structures involved in a reflex action.



a) The neurones labelled 1, 2 and 4 form a reflex arc.
Name each of these neurones

1 _____

2 _____

3 _____

(2)

b) What name is given to the gap found between each of these neurones

_____ (1)

c) Some neurones found in Area A may transmit impulses to another part of the Central Nervous System (CNS)
Name the part of the CNS which receives these impulses

(1)

d) Describe the response that occurs at B

(1)

e) What is the function of reflex actions?

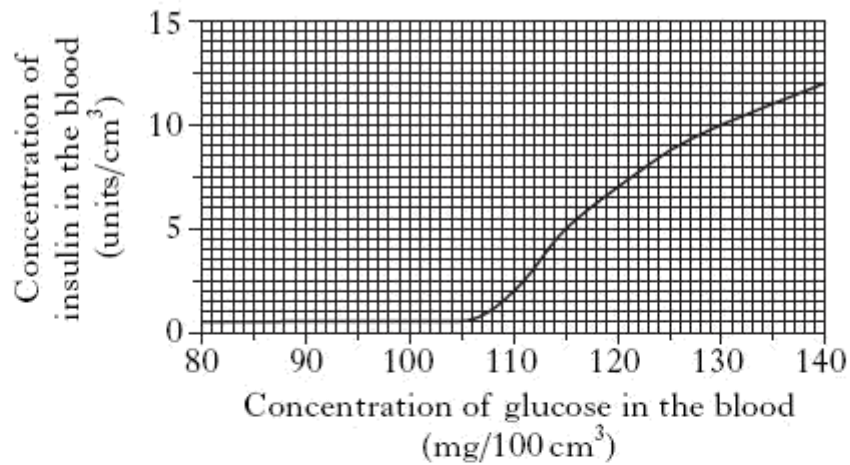
(1)

12. The graphs below contain information about the regulation of blood sugar.

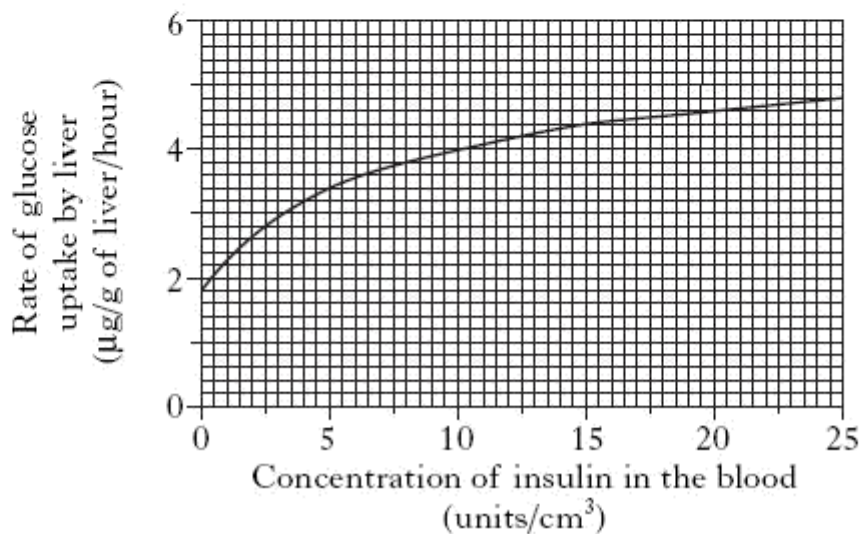
Graph 1 shows how the concentration of glucose in the blood affects the concentration of insulin.

Graph 2 shows how the concentration of insulin in the blood affects the rate of glucose uptake by the liver

Graph 1



Graph 2



- a) From **Graph 1**, state the glucose concentration which triggers an increase in insulin production
_____ (1)
- b) Name the organ which produces insulin
_____ (1)
- c) From **Graph 2**, calculate the percentage increase in the rate of glucose uptake by the liver when the concentration of insulin in the blood rises from 10 to 15 units/cm³

_____ (1)
- d) From **Graphs 1 and 2**, state the rate of glucose uptake by the liver when the concentration of glucose in the blood is 130mg/100cm³
_____ µg/g of liver/hour (1)

Areas I need to work on: