Exampro GCSE Biology

B1 Chapter 2 Coordination

Foundation tier

Name:

Class:

Author:

Date:

Time: 78

Marks: 78

Comments:

Q1. The body controls internal conditions.

(a) Use words from the box to complete the sentences about water loss from the body.

kidneys	**liver**	**lungs**	**skin**

(i) Water is lost in sweat via the .....

(1)

(ii) Water is lost in urine via the .....

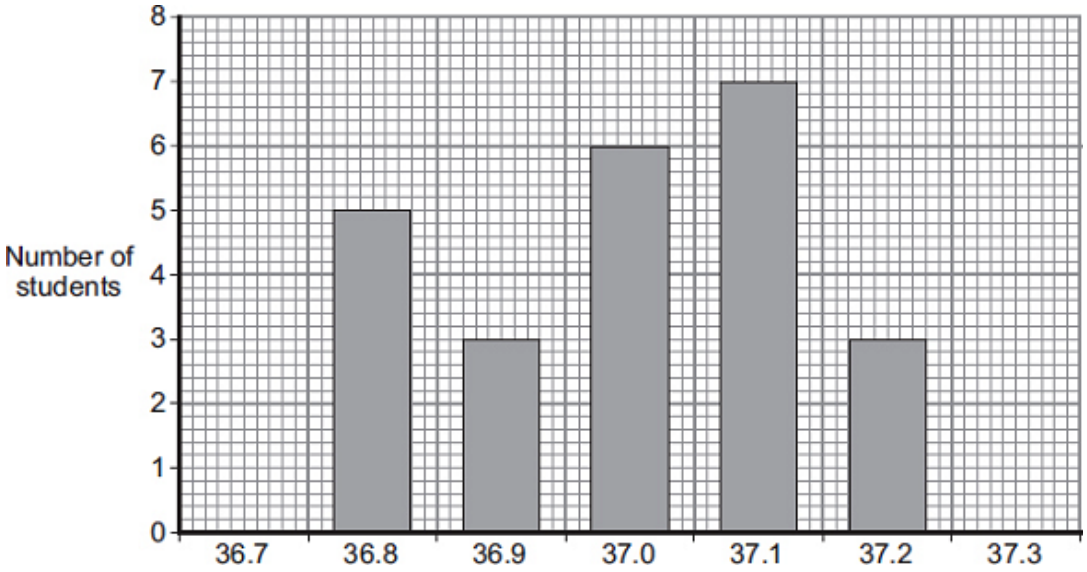
(1)

(iii) Water is lost in the breath via the .....

(1)

(b) Students investigated body temperature in the class.

The bar chart shows the results.



(i) One student used the bar chart to calculate the mean body temperature of the class.

The student calculated the mean body temperature as 37.0 °C.

How did the student use the bar chart to calculate the mean?

.....

.....

.....

.....

(2)

(ii) How many students had a body temperature higher than the mean of 37.0 °C

.....

(1)

(iii) Body temperature must be kept within a narrow range.

Why?

.....

.....

(1)

(Total 7 marks)

Q2. The nervous system allows humans to react to their surroundings.

(a) Sense organs have receptors. Receptors detect *changes in the environment.*

Which word describes *a change in the environment?*

Draw a ring around **one** answer.

an effector **a neurone** **a stimulus**

(1)

(b) The photograph shows a baby.
Labels **A**, **B**, **C**, **D** and **E** show some of the baby's sense organs.

Photo by D. Sharon Pruitt [CC-BY-2.0], via Wikimedia Commons

Answer each question by writing **one** letter, **A**, **B**, **C**, **D** or **E**, in each box.

(i) Which sense organ has receptors sensitive to light? ☐

(1)

(ii) Which **two** sense organs have receptors sensitive to chemicals?

☐ and ☐

(2)

(iii) Which sense organ has receptors sensitive to changes in the baby's position? ☐

(1)

(c) Information from sense organ **A** is passed along nerve cells.
The information is coordinated to produce a response.

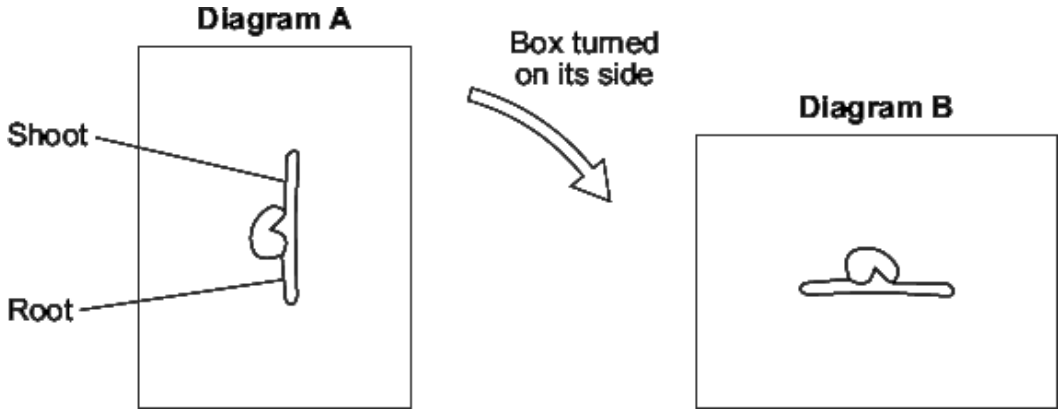
Which organ in the body coordinates the information?

.....

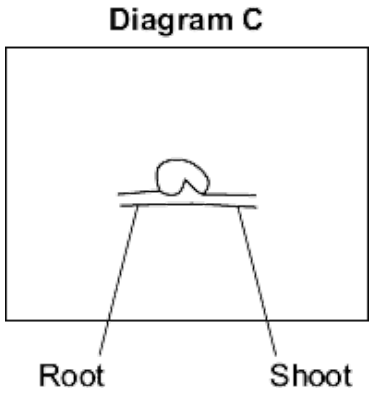
(1)
(Total 6 marks)

Q3. A student investigated growth responses in plants.

The student grew a bean seed in a box filled with moist soil, as shown in **Diagram A**. After the seed had started to grow, the box was turned onto its side and placed in a dark room, as shown in **Diagram B**.



(a) Complete **Diagram C** to show what the root and shoot will look like three days later.



(2)

(b) Draw a ring around the correct answer to complete the sentence.

The results of the investigation show that the root is sensitive to

light.

moisture.

gravity.

(1)

(c) A hormone in the plant causes the growth responses.

What is the name of this hormone?

Tick (✓) **one** box.

Auxin ☐

Statin ☐

Steroid ☐

(1)

(d) Gardeners can use some plant hormones as weed killers.

(i) Give **one different** use of plant hormones by gardeners.

.....

.....

(1)

(ii) Selective weed killers only kill some plants in a garden.

Killing weeds in a garden reduces competition between plants.

Give **three** factors that plants compete for.

1 .....

2 .....

3 .....

(3)

(Total 8 marks)

Q4. The photograph shows an athlete at the start of a race.

(a) The athlete's sense organs contain special cells.
These special cells detect changes in the environment.

(i) **List A** shows changes in the environment.

List B shows some of the athlete's sense organs.

Draw **one** line from each change in the environment in **List A** to the sense organ detecting the change in **List B**.

List A **Change in the environment**	**List B** **Sense organ**
	Ear
Sight of the finishing line	
	Nose
Sound of the starting gun	
	Eye
Pressure of the ground on the fingers	
	Skin

(3)

(ii) Which cells detect changes in the environment?

Tick (✓) **one** box.

Gland cells ☐

Muscle cells ☐

Receptor cells ☐

(1)

(b) During the race, the concentration of sugar in the athlete's blood decreases.

Why?

.....

.....

(1)

(c) Some athletes use anabolic steroids to improve performance.

(i) Draw a ring around the correct answer to complete the sentence.

Anabolic steroids increase

- breathing rate.
- growth of muscles.
- heart rate.

(1)

(ii) Sporting regulations ban the use of anabolic steroids.

Suggest **one** reason why.

.....

.....

(1)

(Total 7 marks)

Q5. Diabetes is a disease in which the concentration of glucose in a person's blood may rise to fatally high levels.
Insulin controls the concentration of glucose in the blood.

(a) Where is insulin produced?

Draw a ring around **one** answer.

gall bladder **liver** **pancreas**

(1)

(b) People with diabetes may control their blood glucose by injecting insulin.

(i) If insulin is taken by mouth, it is digested in the stomach.

What type of substance is insulin?

Draw a ring around **one** answer.

carbohydrate **fat** **protein**

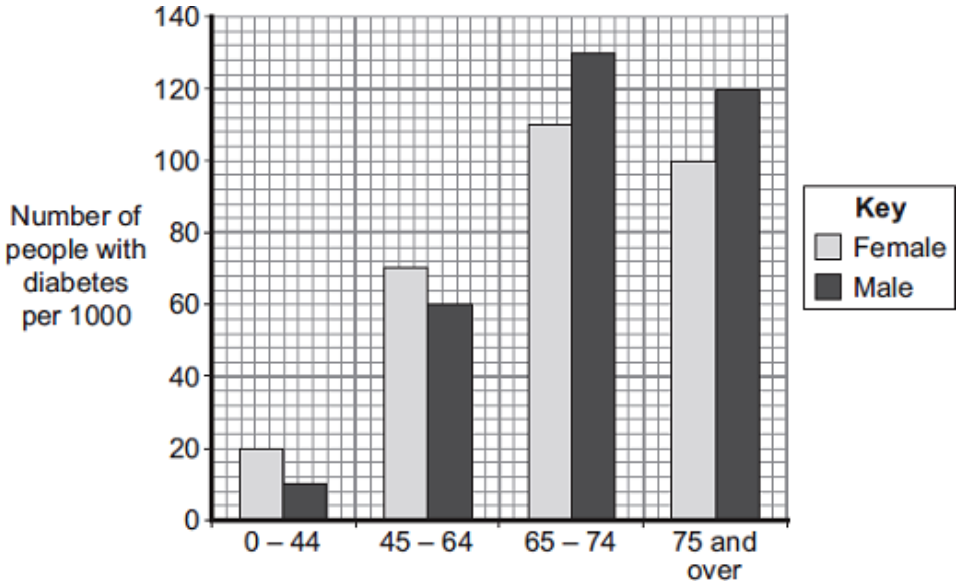
(1)

(ii) Apart from using insulin, give **one** other way people with diabetes may reduce their blood glucose.

.....

(1)

(c) The bar chart shows the number of people with diabetes in different age groups in the UK.



(i) Describe how the number of males with diabetes changes between the ages of 0 – 44 years and 75 years and over.

.....

.....

.....

.....

.....

.....

.....

.....

(3)

(ii) Compare the number of males and females with diabetes:

between the ages of 0 and 64 years

.....

.....

.....

over the age of 65 years.

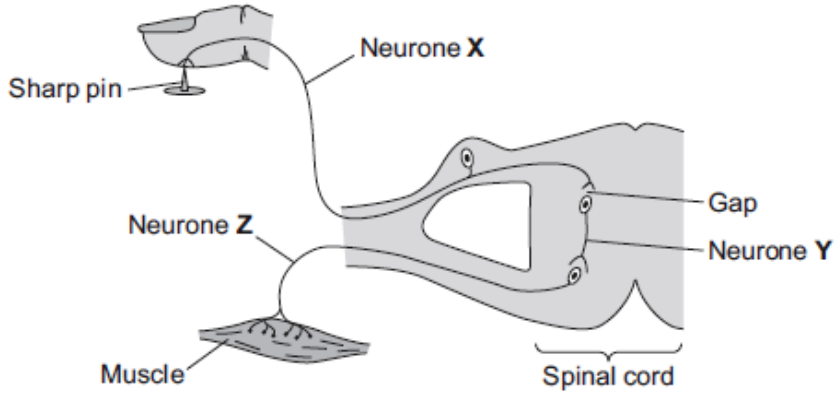
.....

.....

.....

(2)
(Total 8 marks)

Q6. The diagram below shows the pathway for a simple reflex action.



(a) What type of neurone is neurone **X**?

Draw a ring around the correct answer.

motor neurone **relay neurone** **sensory neurone**

(1)

(b) There is a gap between neurone **X** and neurone **Y**.

(i) What word is used to describe a gap between two neurones?

Draw a ring around the correct answer.

effector **receptor** **synapse**

(1)

(ii) Draw a ring around the correct answer to complete the sentence.

Information passes across the gap as

a chemical.
an electrical impulse.
pressure.

(1)

(c) Describe what happens to the muscle when it receives an impulse from neurone **Z**. How does this reflex action help the body?

What happens to the muscle .....

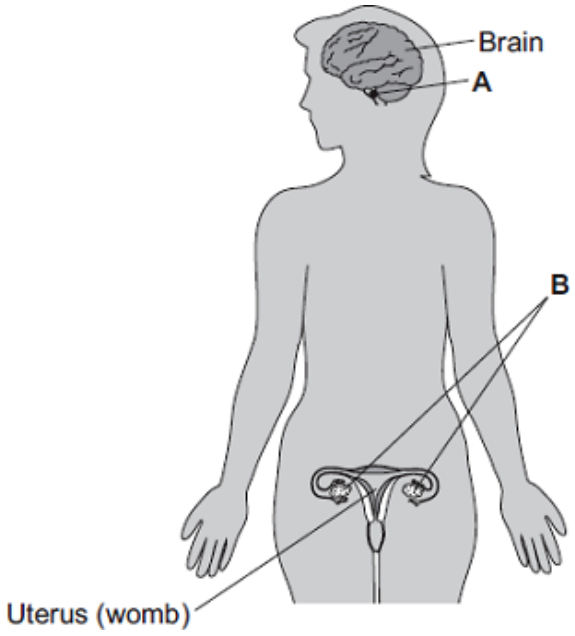
.....

How this helps the body .....

.....

(2)
(Total 5 marks)

Q7. The diagram shows the position of two glands, **A** and **B**, in a woman.



(a) (i) Name glands **A** and **B**.

A .....

B .....

(2)

(ii) Gland **A** produces the hormone Follicle Stimulating Hormone (FSH).

FSH controls changes in gland **B**.

How does FSH move from gland **A** to gland **B**?

.....

(1)

(b) (i) A woman is not able to become pregnant. The woman does not produce mature eggs. The woman decides to have In Vitro Fertilisation (IVF) treatment.

Which **two** hormones will help the woman produce and release mature eggs?

Tick (✓) **one** box.

FSH and Luteinising Hormone (LH) ☐

FSH and oestrogen ☐

Luteinising Hormone (LH) and oestrogen ☐

(1)

(ii) Giving these hormones to the woman helps her to produce several mature eggs. Doctors collect the mature eggs from the woman in an operation.

Describe how the mature eggs are used in IVF treatment so that the woman may become pregnant.

.....

.....

.....

.....

.....

.....

(3)

(iii) IVF clinics have been set a target to reduce multiple births.

> At least 76% of IVF treatments should result in single babies and a maximum of 24% of treatments should result in multiple births.

Suggest **one** reason why the clinics have been set this target to reduce multiple births.

.....

.....

(1)

(c) Two clinics, **R** and **S**, used IVF treatment on women in 2007. Doctors at each clinic used the results of the treatments to predict the success rate of treatments in 2008.

The table shows the information.

	Total number of IVF treatments in 2007	**Number of IVF treatments resulting in pregnancy in 2007**	**Predicted percentage success rate in 2008**
Clinic **R**	1004	200	18–23
Clinic **S**	98	20	3–56

(i) Compare the success rates of the two clinics in 2007.

.....

.....

(1)

(ii) The range of the predicted success rate in 2008 for clinic **R** is much smaller than the range of the predicted success rate for clinic **S**.

Suggest why.

.....

.....

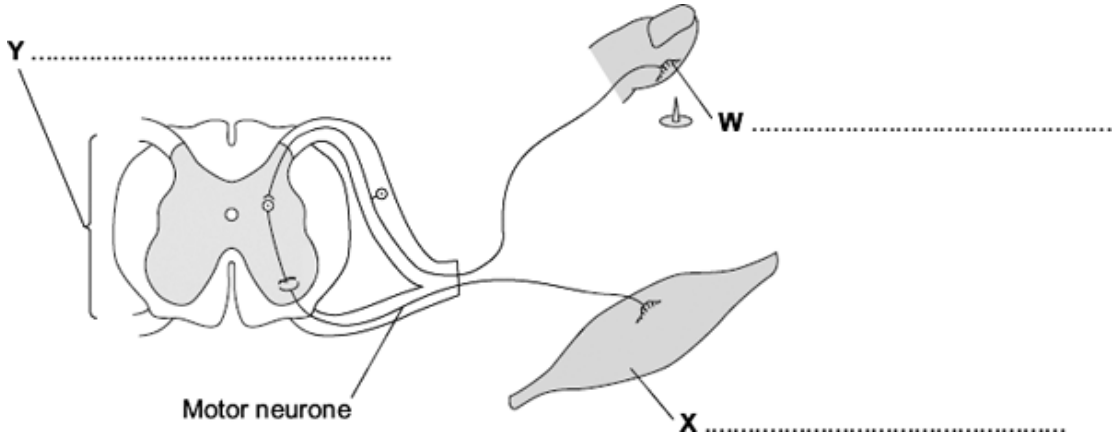
.....

.....

(2)

(Total 11 marks)

Q8. The diagram shows the structures involved in a reflex action.



(a) On the diagram, name the structures labelled **W**, **X** and **Y**.

(3)

(b) The control of blood sugar level is an example of an action controlled by hormones.

Give **two** ways in which a reflex action is different from an action controlled by hormones.

1 .....

.....

.....

2 .....

.....

.....

(2)
(Total 5 marks)

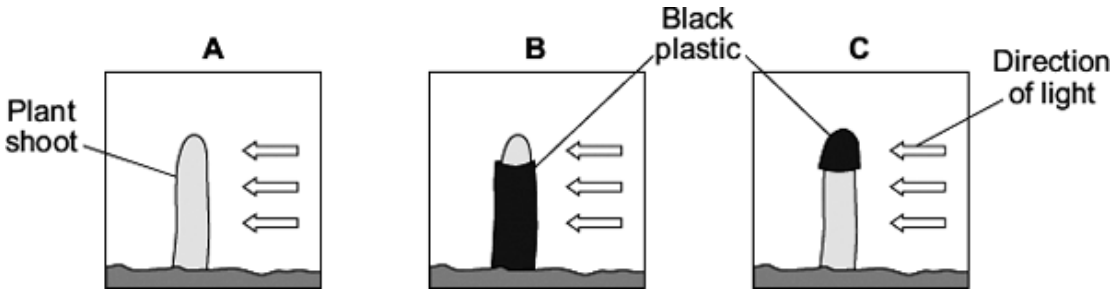
Q9. Charles Darwin investigated tropisms in plants.

Some students did an investigation similar to Darwin's investigation.

The students:

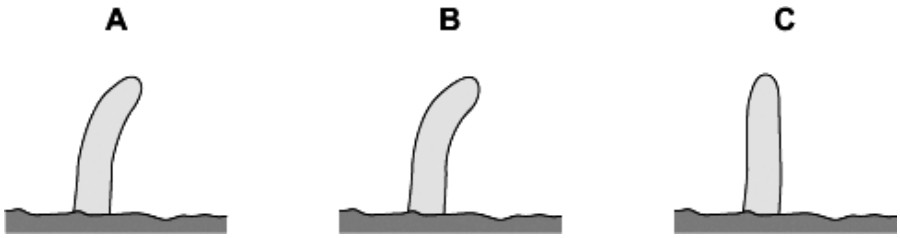
- grew seeds until short shoots had grown
- used black plastic to cover parts of some of the shoots
- put the shoots in light coming from one direction
- put boxes over the shoots to keep out other light.

The diagrams show how the investigation was set up.



Two days later the students took off the black plastic covers and looked at the shoots.

The diagrams show the results.



(a) Give **two** variables that the students should control in this investigation.

.....

.....

.....

.....

(2)

(b) Shoot **A** bent towards the light as it grew.

Explain how.

.....

.....

.....

.....

.....

.....

.....

.....

(4)

(c) What conclusions can be drawn from the results about:

(i) the detection of the light stimulus

.....

.....

(1)

(ii) where in the shoot the response to the light takes place.

.....

.....

(1)
(Total 8 marks)

Q10. Hormones regulate the functions of many organs.

Complete the following sentences.

(a) Hormones control the monthly release of an egg from the woman's ..... .

(1)

(b) Hormones also control the thickness of the lining of her ..... .

(1)

(c) Hormones given to women to stimulate the release of eggs are called ..... drugs.

(1)
(Total 3 marks)

Q11. In-vitro fertilisation (IVF) is used to help some women get pregnant.

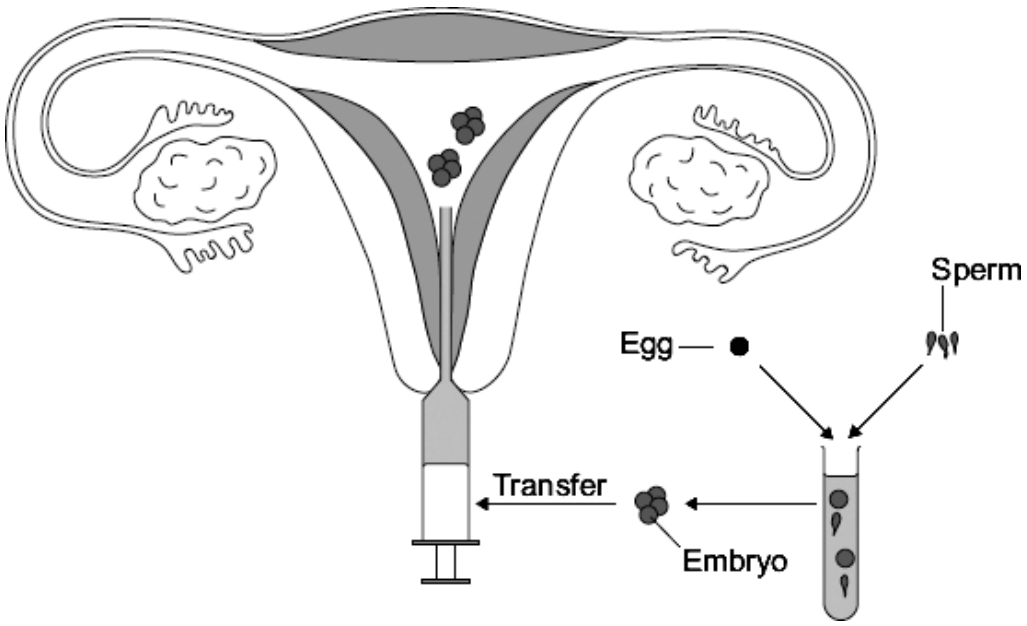
(a) Name the **two** hormones used in IVF treatment.

1 .....

2 .....

(2)

(b) The diagram shows the process of IVF.



Describe the process of IVF. Use information from the diagram to help you.

.....

.....

.....

.....

.....

.....

.....

.....

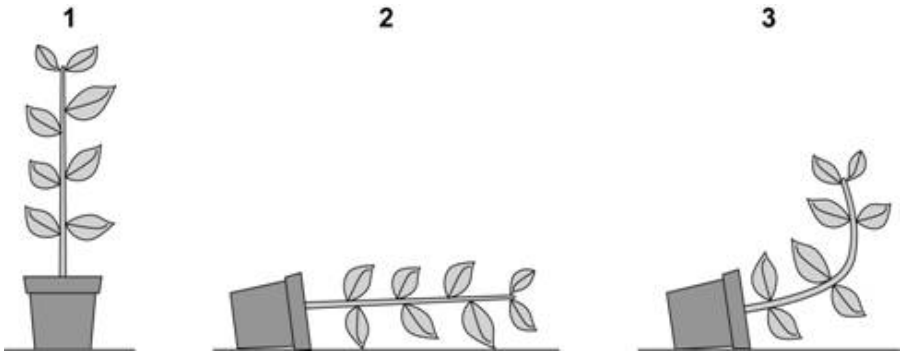
.....

(4)
(Total 6 marks)

Q12. A student grew a plant in an upright pot.

She then put the pot in a horizontal position and left the plant in the dark for two days.

Diagram **3** shows the potted plant after two days in the dark.



Plant growing upright | **Plant put horizontal in the dark** | **Plant after 2 days in the dark**

Explain fully why the plant responded in this way.

.....

.....

.....

.....

.....

.....

.....

.....

(Total 4 marks)

M1. (a) (i) skin

1

(ii) kidneys

accept kidney

1

(iii) lungs

accept lung

1

(b) (i) multiply temperature by number of students at that temperature and add them up

allow (36.8 × 5) + (36.9 × 3) + (37.0 × 6) + (37.1 × 7) + (37.2 × 3)

allow 888

1

divide by number of students

allow divide by 24

1

(ii) 10 / ten

1

(iii) so <u>enzymes</u> work (well)

ignore death / overheating / hypothermia

allow body <u>reactions</u> work (well)

1

[7]

M2. (a) a stimulus

1

(b) (i) **A**

1

(ii) **C**

either order

1

D

1

(iii) **E**

1

(c) brain

allow spinal cord / CNS / <u>central</u> nervous system

*do **not** allow spine*

1

[6]

M3. (a) diagram to show root growing down

*allow single lines **or** not attached **or** open ends for both marks*
all branches must go down

1

diagram to show shoot growing up

all branches must go up

1

(b) gravity

1

(c) Auxin

1

(d) (i) rooting / cuttings

accept other suggestions, eg fruit set / ripening
*do **not** accept weed killers*

1

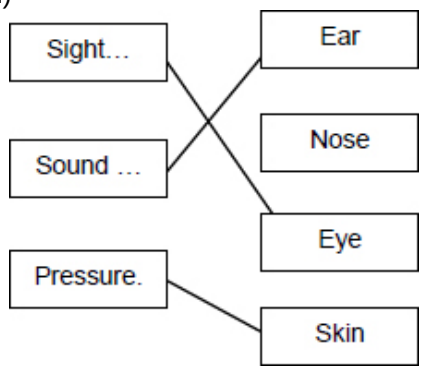
(ii) any **three** from:

- light
  ignore sun / energy
- water / moisture
- nutrients / ions / minerals
  accept one named mineral
  ignore nutrition / food
- space / area
  ignore soil / land / territory / volume
  ignore reference to gases

3

[8]

M4. (a) (i)



***1** mark for each line*
*do **not** award a mark for a 'change' that has two lines*

3

(ii) receptor cells

1

(b) used to provide (extra) energy

allow (more) used in respiration

allow suitable reference to muscles

*do **not** accept used for sweat*

1

(c) (i) growth of muscles

1

(ii) (these drugs have) possible side / harmful effects
or
answers that refer to 'fairness of competition' e.g. cheating

1

[7]

M5. (a) pancreas

apply list principle

1

(b) (i) protein

apply list principle

1

(ii) any **one** from:

- (controlling / changing) diet
  accept sugar(y foods) / named eg
  ignore references to starch / fat / protein / fibre
- exercise
  accept example, eg go for a run
- pancreas transplant
  accept named drug eg metformin

1

(c) (i) increase

ignore reference to women

1

then fall

1

relevant data quote (for male)

*eg max at ages 65–74 **or** starts at 10 (per thousand) **or** max at 130 (per thousand) **or** ends at 120 (per thousand)*

accept a difference between any pairs of numbers in data set

*accept quotes from scale eg '130' or '130 <u>per</u> thousand' but **not** '130 thousand'; to within accuracy of +/- 2 (per thousand)*

1

(ii) (between 0 and 64) more females (than males) **or** less males (than females)

ignore numbers

allow eg females more diabetic than males

1

(over 65) more males (than females) or less females (than males)

allow eg males more diabetic than females

1

[8]

M6. (a) sensory neurone

1

(b) (i) synapse

1

(ii) a chemical

1

(c) (What happens to the muscle)

mark both parts of the question together

any **one** from:

- contraction / contracts

  ignore relaxation / relaxes / tenses

  1

- gets shorter

(How this helps the body)

idea of protection for body (from damage / pain)

eg moves finger / arm away (from pin / stimulus / source of pain)

1

[5]

M7. (a) (i) **A** – pituitary

allow hypothalamus

1

B – ovary / ovaries

1

(ii) in blood (stream)

accept in plasma

ignore dissolved

1

(b) (i) FSH and Luteinising Hormone (LH)

1

(ii) fertilised
OR
reference to sperm

1

form embryos / ball of cells or cell division

1

(embryo) inserted into mother's womb / uterus
allow (fertilised egg) is inserted into mother's womb / uterus

1

(iii) any **one** from:

- multiple births lead to low birth weight
- multiple births cause possible harm to mother / fetus / embryo / baby / miscarriages
  allow premature
  ignore reference to cost / ethics / population

1

(c) (i) any **one** from:

- almost identical
  allow S (slightly) more successful
- both approximately 20%

1

(ii) larger numbers (in clinic R) (in 2007)
allow only 98 (in S) (compared to 1004 (in R))

1

results likely to be more repeatable (in 2008)
allow more reliable
*do **not** accept more reproducible / accurate / precise*

1

[11]

M8. (a) Y - spinal cord / central nervous system / CNS
*do **not** accept spine*
ignore nerve / nervous system / coordinator
ignore grey / white matter

1

W - receptor / nerve ending
ignore sensory / neurone / stimulus

1

X - effector / muscle
allow gland

1

(b) any **two** from: eg

accept reverse argument for each marking point

- reflex action quicker
- effect of reflex action over shorter period
- hormone involves blood system and reflex involves neurones / nerve cells
  ignore nervous system / nerves
- reflex involves impulses and hormone involves chemicals
- reflex action affects only one part of the body
  ignore involves brain
  ignore outside / inside stimuli

2

[5]

M9. (a) any **two** control variables for **1** mark each:

- age / size of shoots
- species **or** type of plant / seeds
- light intensity
  accept amount of light / colour of light
- (other) named condition eg temperature / water

2

(b) *ignore reference to phototropism*

ref to auxin / hormone

1

unequal (lateral) distribution

1

more hormone on dark side

1

causes growth on dark side

1

(c) (i) (detection) in tip / top / end

1

(ii) (response) behind tip

allow at tip / end / top half

1

[8]

M10. (a) ovary

1

(b) womb / uterus

1

(c) fertility

1

[3]

M11. (a) FSH / follicle stimulating hormone

allow FHS

either order

1

LH / luteinizing hormone

1

(b) any **four** from:

- egg(s) collected from ovary
- (eggs) mixed with sperm **or** fertilisation occurs

  allow eggs and sperm put into tube
- fertilised egg divides
- embryo formed
- (embryos) inserted into womb / uterus

  ignore references to vagina
- FSH matures egg **and** LH releases eggs

4

[6]

M12. gravity

accept gravitropism / geotropism

1

caused redistribution of auxin / hormone to lower side of stem

1

these hormones stimulate growth of cells on the lower side of the stem only

1

so the stem grows upwards

1

[4]