MARK SCHEME

GCSE

BIOLOGY

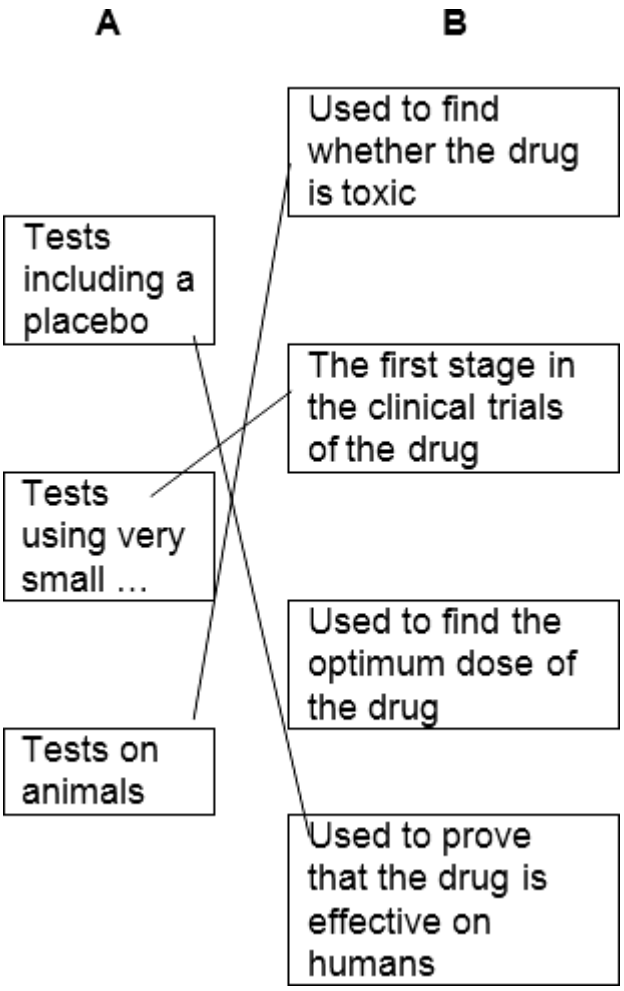
AQA - TRIPLE SCIENCE

B 5 - TEST 3

HOMEOSTASIS

Intermediate

1. (a)



1 *mark for each correct line*

mark each line from left hand box

two lines from left hand box cancels mark for that box

3

(b) any **three** from:

Students have been informed that the headline is not justified

- reference to reliability, eg only a small number of mice tested
  or trial too short
  or investigation not repeated

- reference to control, eg mice given caffeine not coffee
  or 6 cups (equivalence) is more than 1 dose

- (and) the effect on mice might not be same as on humans

  allow only tested on mice

- (also) text suggests that the treatment improves memory loss (rather than delays it)

  accept text suggests disease cured

  or mice already have memory loss or experiment only showed improvement in memory
  or does not show **delays** Alzheimer's
  or experiment not done on old mice

  allow reference to the fact that mice engineered to have it

3

[6]

2. (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]

3. Marks awarded for this answer will be determined by the Quality of Communication (QC) as well as the standard of the scientific response. Examiners should also apply a 'best-fit' approach to the marking.

0 marks
No relevant content.

Level 1 (1 – 2 marks)
There is a description of thermoregulation **or** at least one correct mechanism (skin, sweat glands or muscles) but roles may be confused.

Level 2 (3 – 4 marks)
There is a description of thermoregulation **or** some correct mechanisms (sweating, shivering, blood flow in the skin).

Level 3 (5 – 6 marks)
There is a clear description of thermoregulation by TC or skin **and** some correct control mechanisms.

examples of biology points made in the response:

full marks may be awarded for detailed description of what happens if the core temperature is <u>either</u> too high <u>or</u> too low

- temperature receptors in TC
- the TC detects (core) body / blood temperature
- temperature receptors in the skin send impulses to the TC, giving information about skin temperature
- if the core body temperature is too high: blood vessels / arterioles supplying the skin capillaries dilate / vasodilation

  ***do not** accept refs to veins instead of arterioles or answers that imply blood vessels have moved up / down through the skin.*
- so that more blood flows (through the skin) and more heat is lost
- sweat glands release more sweat to cool the body
- by evaporation
- if the core body temperature is too low: blood vessels supplying the skin capillaries constrict
- to reduce the flow of blood (through the skin) and less heat is lost

  allow idea of blood diverted to vital organs in extreme cold
- muscles may shiver to release (heat) energy
- from respiration, some of which is lost as heat

[6]

4. (a) (i) chemical

1

(ii) pituitary gland

1

(b) 8

allow 9 or 10

1

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

- progesterone starts being produced at 4 weeks / no progesterone before 4 weeks
- and then / from 4 weeks increases
- oestrogen at constant / low level (from 0) to 20 weeks
- and then / from 20 weeks increases
- from 20 − 36 weeks level of O rises more steeply than that of P

or

- P is always higher than 0 from 6 to 36 weeks

*if no other marks awarded, allow progesterone and oestrogen both increase / rise for **1** mark.*

4

(ii) oxytocin

1

level of oxytocin increases just before birth

1

[9]

5. (a) (i) any **one** from:

- chemical messenger / message

  allow substance / material which is a messenger

- chemical / substance produced by a gland

  allow material produced by a gland

- chemical / substance transported to / acting on a target organ

- chemical / substance that controls body functions

1

(ii) gland / named endocrine gland

brain alone is insufficient

allow phonetic spelling

1

(iii) in blood / plasma **or** circulatory system **or** bloodstream

accept blood vessels / named

*do **not** accept blood cells / named*

1

(b) *each hormone must be linked to correct action*

apply list principle

ignore the gland producing hormone

FSH stimulates oestrogen (production) / egg maturation / egg ripening

ignore production / development of egg

1

oestrogen inhibits FSH

allow oestrogen stimulates LH / build up of uterine <u>lining</u>

1

LH stimulates egg / ovum release / ovulation

accept LH inhibits oestrogen
accept LH controls / stimulates growth of corpus luteum
ignore production of egg

1

[6]

6. (a) homeostasis

1

(b) in sequence:

pancreas

1

liver

1

glycogen

correct spelling only

1

glucagon

correct spelling only

1

(c) (i) broken down / digested

1

further detail eg into amino acids / by enzymes / by proteases

1

(ii) diet / eating less sugar / less fat

ignore balanced diet

or

ignore 'dieting' / slimming diet

exercise

accept pancreas transplant

1

(d) (i) sensible suggestion
eg (owner's) smell / sweating / change in owner's behaviour / dizziness / tiredness

1

(ii) any **five** from:

*allow **1** mark for justified conclusion*

*do not allow full marks unless at least **1** pro and **1** con.*

Pro:
- % below normal decreases
- % in normal increases
- reliable / repeatable / valid data as large number of samples

do not allow accurate / precise
- patients express satisfaction.

Con:
- may not be reliable as blood glucose measurements for only 5 patients / survey of only 16 (dog owners)
- % above normal increases / dogs are less good at detecting high glucose.

5

(e) glucose in urine of diabetic (and not in the non-diabetic)

1

urea and Na+ ions are similar in each / slightly lower in diabetic

1

+ any **three** from:
- no protein in either urine sample because protein too large / does not pass through filter
- glucose passes through filter in kidney

ignore glucose is reabsorbed
- non-diabetic: the / all glucose is reabsorbed / taken back into blood
- diabetic: (too much glucose so) cannot all be reabsorbed
- because diabetic has high concentration of glucose in blood
- urea and Na+ lower in diabetic because less water is reabsorbed (due to extra glucose in filtrate).

3

[19]

7. (a) (i) gravitropism / geotropism

not '…tro<u>p</u>ism'

ignore 'positive' or 'negative'

1

(ii) any **two** from:

- anchorage
- takes in water
- takes in ions / minerals / salts / correct named example

allow nutrients

do not accept food

2

(iii) auxin

1

(b) Marks awarded for this answer will be determined by the Quality of Communication (QC) as well as the standard of the scientific response.
Examiners should also refer to the information on page 5, and apply a best-fit approach to the marking.

0 marks
No relevant content.

Level 1 (1 – 2 marks)
There is a basic description of a simple method involving seedlings and light.

Level 2 (3 – 4 marks)
There is a description of a method involving seedlings in 1-sided light, and a control, with a correct observation.

Level 3 (5 – 6 marks)
There is a description of a method involving groups of seedlings in 1-sided light, and in control conditions. It includes some correct measurements or observations.

examples of Biology points made in the response:

- use of scissors to cut tips from some shoots / cut hole in box
- use of forceps for handling seedlings
- use of ruler to measure lengths of shoots at start and at end
- other factors controlled – eg temperature / water
- use of lamp + box re. one-sided lighting
- repetitions – each treatment ≥ 3 times
- control in total darkness / all-round light
- time taken = several hours to a few days
- sample results: tip exposed to 1-sided light→bend to light, tip removed→vertical, control→vertical

6

[10]

8. (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]