

M1. (a) (concentration high) in the hepatic portal vein is blood with glucose absorbed from the intestine

1

concentration is lower in the hepatic vein because insulin

1

(has caused) glucose to be converted into glycogen

1

or

allows glucose into liver cells

(b) (i) (after 6 hours) most of the glucose has been absorbed from the intestine **or** from food into the blood

1

(ii) because glucagon (made in the pancreas) causes
if biological terms incorrectly spelt they must be phonetically accurate
do **not** accept glucagon made / produced by the liver

1

glycogen to be converted into glucose

1

glucose released into blood
allow the liver maintains the correct / constant level of glucose in the blood

1

[7]

M2. (a) in rainforest:

accept converse

(water from) sweat does not evaporate (as much)

max 1 if not clear whether desert or rainforest

1

any **one** from:

- (due to) less wind / higher moisture / humidity
- less cooling effect

ignore references to temperature

1

(b) blood vessels supplying capillaries dilate / widen **or** vasodilation

*do **not** award mark if candidate refers only to blood vessels dilating **or** to capillaries dilating.*

*accept 'arteries' or 'arterioles' for 'blood vessels supplying, capillaries' but do **not** accept 'veins'.*

ignore expand / get bigger / relax / open

*do **not** accept idea of blood vessels moving*

1

more blood (through skin / surface capillaries) leads to greater heat loss

1

[4]

M3. (a) proteins are not filtered 1

glucose is filtered and (re)absorbed
allow glucose (completely) reabsorbed 1

ions are filtered and some (re)absorbed
allow some ions are reabsorbed 1

urea is filtered [and some / none (re)absorbed]
allow some / no urea is reabsorbed 1

(b) more / a lot of sweating occurred
accept converse arguments for cold day 1

more / a lot of water loss (by sweating) 1

more / a lot of water reabsorption / more water absorption by the kidney 1

lower volume of urine
allow less urine / less water in urine 1

[8]

M4. (a) 0.18

*award both marks for correct answer irrespective of working
if no answer or incorrect answer
allow 1 mark for $45 \times 100 / 25000$*

2

(b) heat / thermal

allow heat from respiration

1

(c) energy / mass / biomass lost / not passed on **or** energy / mass / biomass is used **or** not enough energy / mass / biomass left

ignore reference to losses via eg respiration / excretion / movement / heat

1

a sensible / appropriate use of figures including heron

*eg only 2 from frog / to heron
ignore units*

1

(d) any **three** from:

accept marking points if candidate uses other terms for microorganisms

- (microorganisms) decay / decompose / digest / breakdown / rot
ignore eat
- (breakdown) releases minerals / nutrients / ions / salts / named
ignore food
- (microorganisms) respiration
ignore other organisms respiring
- (microorganisms / respiration) release of carbon dioxide

3

[8]

- M5.** (a) (i) 1 hour 15 mins / 1.25 hours / 75 mins
allow 1:15
ignore 1.15 hours 1
- (ii) increase in (core / body) temperature
ignore numbers 1
- (due to an) increase in respiration **or** more muscle contraction 1
- releasing energy (as a waste product)
allow produces 'heat'
*do **not** allow making energy* 1
- skin temperature decreases 1
- (because there is) sweating 1
- (which) evaporates and cools the skin
ignore references to vasodilation or vasoconstriction 1
- (iii) (there is) dilation of vessels (supplying skin capillaries)
allow vasodilation
allow blood vessels widen
ignore expand
*do **not** accept dilating capillaries or moving vessels* 1
- (so) more blood flows (near skin) (surface) **or** blood is closer (to the skin)
ignore ref to heat 1
- (c) pancreas detects (low) blood glucose 1
- produces glucagon

do **not** allow glucagon made in the liver

1

(so) glycogen is converted to glucose

allow adrenaline released which increases conversion of glycogen to glucose

or

reduced insulin production so less glucose into cells / less glucose converted to glycogen

for 1 mark

1

[12]

M6.(a) if body temperature too high blood vessels supplying skin (capillaries) dilate / widen
do not accept capillaries / veins dilate/constrict

1

if body temperature is too low blood vessels supplying skin (capillaries)
constrict / narrow

do not accept idea of blood vessels moving (through skin)

1

ignore expand

accept arteries / arterioles for 'blood vessels'

*if no reference to skin allow blood vessels dilate and blood
vessels constrict for one mark*

so more / less blood flows through skin (capillaries) or nearer the surface of
the skin

must correctly relate to dilation or constriction

1

so more / less heat is lost (from the skin by radiation)

must correctly relate to dilation or constriction

1

(b) sweat released

1

cannot evaporate because of high humidity / all the water vapour in the air

1

so less heat lost / less cooling

or

it is evaporation of sweat that cools the body

1

[7]

M7.(a) Pancreas

allow phonetic spelling

1

(b) any **three** from:

max 2 if any one process goes on in wrong organ

- (amino acids) broken down
- (amino acids) form urea
- (amino acids broken down / converted **or** urea formed) in liver
- (urea / broken down amino acids) removed / filtered by kidney
*do **not** allow amino acids filtered / removed by kidney*
- (urine / urea / broken down amino acids) stored / held in bladder
*do **not** allow amino acids stored / held in bladder*

3

[4]

M8. (a) (i) A 1

(ii) (protein) molecule is large
ignore letters 1

cannot pass through filter
(protein is) too big to get through the filter = 2 marks 1

(b) **B** is taken back into the blood **or**
B is reabsorbed 1

reabsorbed completely
or reabsorbed after filtration 1

(c) RBC is too big to pass through filter 1

Haemoglobin is inside red blood cells
or haemoglobin released when RBC bursts 1

Haemoglobin is small enough to pass through filter
or haemoglobin diameter 1

[8]