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 <u>absorbed</u> 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 <u>made</u> / <u>produced</u> 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 <u>heat loss</u>

1

[4]

M3. (a) proteins are not filtered

1

glucose is filtered and (re)absorbed

allow glucose (completely) <u>re</u>absorbed

1

ions are filtered and some (re)absorbed

allow some ions are <u>re</u>absorbed

1

urea is filtered [and some / none (re)absorbed]

allow some / no urea is <u>re</u>absorbed

1

(b) <u>more / a lot of</u> sweating occurred

accept converse arguments for cold day

1

<u>more / a lot of</u> water loss (by sweating)

1

<u>more / a lot of</u> water reabsorption / <u>more</u> 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 × 100 / 25000*

2

(b) heat / thermal

allow heat <u>from</u> 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 <u>only</u> **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 <u>respiration</u> **or** more <u>muscle</u> 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 near<u>er</u> 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 <u>released</u>

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]