AQA GCSE BIOLOGY (HIGHER) · 8461

BIOLOGY



MARK SCHEME

4.2.2 ANIMAL TISSUES, ORGANS AND ORGAN SYSTEMS (PACK 3)

SCORE	PERCENTAGE
/244	%

STEMUP

These questions belong to AQA, not to us.

The examination questions, mark schemes and examiner comments in this pack were written and published by AQA. They are past assessment materials, reproduced here so that students can revise from them.

What we do not own

STEMUP is not affiliated with AQA and does not own, and makes no claim to own, any of the question, mark scheme or examiner report material in this pack. AQA has not endorsed, approved or been involved in the production of it. AQA and the qualification titles used here belong to their respective owners and appear for identification only.

Where to find the originals

AQA publishes its past papers, mark schemes and examiner reports. Always check the current specification at aqa.org.uk before you revise, because content and wording can change between series.

If you hold the rights to any material in this pack and would like it amended or removed, contact admin@stemup.co.uk and we will act on it.

Q1.

(a) (i) 8.6

accept value in range 8.5 to 8.7

1

(ii) hydrochloric acid / HCl

accept HCL

accept hydrogen chloride

ignore hcl / etc.

1

(iii) X

1

(b) Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information in the Marking guidance.

0 marks
No relevant content.

Level 1 (1-2 marks)
There is a simple description of part of a process or a reference to at least one of: mechanical digestion, lipase, product of enzyme action, bile, site of production or site of digestion

Level 2 (3-4 marks)
There is a description of at least one process linking ideas

Level 3 (5-6 marks)
There is a clear description of the process including reference to the majority of: mechanical digestion, lipase, bile, where they are produced, products, function of bile and site of digestion / absorption

Examples of biological points made in the response:

- mechanical breakdown in mouth / stomach
- fats →fatty acids and / or glycerol
- by lipase
- (produced by) pancreas
- and small intestine
- fat digestion occurs in small intestine
- bile
- produced by liver
- neutralises acid from stomach

STEMUP.CO.UK

- produces alkaline conditions in intestine
- refs. to increased surface area related to emulsification or chewing
- products are small molecules / water-soluble
- products absorbed by small intestine

6

[9]

Q2.

(a) (i) kidney

1

(ii) bladder

1

(iii) liver

1

(iv) lung(s)

1

(v) skin

1

(b) (i) 3000

allow 2970 to 3030

*correct answer gains **2** marks with or without working*

*if answer incorrect allow **1** mark for evidence of 1550 + 450 + 1000 (allow tolerance of + or – ½ square on each)*

2

(ii) 1600

allow 1570 to 1630

1

(iii) 1400

allow (b)(i) – (b)(ii)

1

(iv) correct plot from (b)(iii)

tolerance ½ square ignore width

1

(v) cells swell / overhydrated / damaged

accept poisoned (by urea)

1

[11]

Q3.

(a) **A** artery

allow aorta

1

STEMUP.CO.UK

B ventricle

ignore references to left and right

1

C atrium

ignore references to left and right
allow atria

1

D vein

allow vena cava

1

(b) (i) stent

1

(ii) keeps (artery) open

1

so (more) blood can flow through
allow blood can flow (more) easily
ignore ref to blood clots

1

[7]

Q4.

(a) A aorta

ignore left and right

1

B ventricle

1

C atrium

allow atria

1

D vena cava

1

(b) (i) (coronary) artery
allow arteriole

1

(ii) stent / description
accept (coronary) by-pass operation
allow statins
allow diets low in cholesterol
allow balloon (angioplasty)

1

(iii) (stent) keeps artery open
must relate to (b)(ii)

1

STEMUP.CO.UK

or

ignore reference to capillary / vein

(by-pass) new blood vessel / vein connecting around narrowed region;

or

(statins / low cholesterol diet) remove some of the cholesterol blockage

or

(balloon) widens / opens the blood vessel

1

which allows (more) blood through or allows blood to go around the blockage

(c) (i) F artery

accept arteriole / branch of pulmonary artery

1

G capillary

1

H vein

H accept venule / branch of pulmonary vein;

1

(ii) F (Pulmonary artery) has <u>less</u> oxygen / <u>more</u> carbon dioxide / <u>more</u> glucose / sugar

accept F (Pulmonary artery) is deoxygenated

accept converse for H (Pulmonary vein)

'It' refers to F

1

[12]

Q5.

(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

STEMUP.CO.UK

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]

Q6.

(a) (i) 251.2

*award **2** marks for correct answer, irrespective of working.*
*if incorrect or no answer 62.8 x 4 or equivalent gains **1** mark*

2

(ii) 31.2

allow ecf from (a)(i); answer to (a)(i) – 220

1

(b) any **two** from:

- overweight / obesity **or** increased BMI
  allow get fat
  ignore get heavier
- (Type 2) diabetes
  allow high blood sugar
- high blood pressure
- cardiovascular / heart disease **or** heart problems **or** disease of blood vessels **or** clogged arteries
- high cholesterol
- arthritis / worn joints
- tooth decay

2

[5]

Q7.

(a) (i) addictive

allow addicting / addict / addicted / addiction or similar
allow phonetic spelling
*do **not** accept / additive / addition*

1

(ii) junction / gap / space between neurones

STEMUP.CO.UK

allow nerve cells / nerves for neurones

allow idea where neurones / nerve cells / nerves meet / join

1

(b) (i) tablet with no drug

accept answers that convey this idea eg fake / dummy / sugar pill

allow injection with no drug

ignore drugs that don't work.

1

(ii) for comparison

accept to see if drug / it works

*allow to see psychological effect **or** make sure, it is not all in the mind*

allow as a control

ignore 'to make test fair / unbiased'

1

(iii) Neither doctors nor volunteers

1

(iv) any **two** from:

- age (range)
- sex / gender (mix)
- previous smoking habits **or** eg number smoked (before trial) **or** length of time smoked
- number in the group
- other drugs being taken **or** general health **or** height / weight / BMI / lifestyle / fitness

ignore factors already controlled

*ignore reference to all smokers **or** all want to give up*

2

(c) higher percentage / number of smokers who had stopped smoking (than Drug B)

answers must refer to data and be comparative

allow best results / most effective

ignore best drug unqualified

ignore references to 12 weeks / 1 year

1

[8]

Q8.

(a) any **two** from:

- diet

ignore exercise

STEMUP.CO.UK

accept any reasonable reference to diet
*do **not** accept salt / blood pressure*
ignore age / gender / HDL / LDL

- heredity / genes / genetic makeup
- reference to cholesterol production by liver

2

(b) (i) Blood cholesterol concentration is only one of several factors affecting death from all causes

1

(ii) 170 – 210
accept 210 - 170

1

[4]

Q9.

(a) any **one** from:
*ignore control variables that are not given in the method, such as 'equally crushed' **or** same time*
*do **not** accept volume of apple juice*

- 20 g (of apple) **or** (same) mass / amount / weight of apple
  ignore volume / size
- crushed (apple)
- 10 drops (of solution) **or** (same) number / amount / volume of drops
  *do **not** accept 10 drops of amylase alone*
- apple **or** type of fruit
  ignore type of apple

1

(b) (may) have different volume / amount / sizes
ignore reference to human error
ignore don't know / can't measure size of drop

1

(c) amylase has no / little effect on cell / walls / apple
accept ideas that refer to shape of enzyme being 'incorrect'

or amylase does not breakdown / digest cell / walls / apple
accept amylase <u>only</u> breaks down / digests starch

1

pectinase breaks down cell / walls / apple
allow digest for breakdown
allow shape of pectinase fits cell / walls / apple

1

boiling breaks down cell / walls / apple

STEMUP.CO.UK

1

(d) 11.6

1

enzyme / pectinase destroyed / denatured / damaged / broken down

*do **not** allow kill*

1

only effect of boiling (relevant)

1

[8]

Q10.

(a) (i) capillary

1

(ii) diffusion

1

(iii)

Carbon dioxide	low(er)	high(er)

1

Oxygen	high(er)	low(er)

***1** mark for each correct row*

1

(b) (i) red blood cells

1

(ii) haemoglobin

1

[6]

Q11.

(a) (i) 7500

ignore units

1

(ii) any **two** from

if examples given they must be correct

(differences in)

- age
- gender / sex
- activity /amount of exercise
  allow job / lifestyle
  ignore fitness / health / medication
- metabolism / metabolic rate

STEMUP.CO.UK

allow BMR

- genetic differences
- body weight / mass / size / physique
  allow BMI
- pregnancy
- proportion of muscle to fat

2

(b) **A**

if box empty, allow in explanation

1

more energy taken in than used

accept more food taken in than used
allow correct numbers if comparative
ignore incorrect numbers if comparison correct

1

(c) eat less (food / carbohydrates / fat / calories)

accept a medical treatment such as gastric band / slimming pills / liposuction
ignore balanced / healthy / diet
allow go to weight watchers etc.
ignore burn off more

1

exercise (more) **or** go to the gym

1

[7]

Q12.

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

ignore cancer / AIDS

- as a sleeping pill
  *do **not** accept morning sickness*
- treating leprosy

1

(ii) thalidomide causes birth defects / abnormalities / described

in this order
ignore kill / harm / damage baby

1

to be (more) sure of not getting pregnant

*allow to be certain there is no baby **or** in case one doesn't work*

1

(b) (i) oestrogen

STEMUP.CO.UK

1

progesterone

1

(ii) any **two** from:

- reduce chances of <u>ovarian</u> cancer
- <u>more</u> effective (in preventing pregnancy)
- no pills (to remember) for 7 days (out of every 28)
  allow only taken for 21 days (out of 28)
- doesn't have to be taken at the same time every day

2

(iii) less chance of headaches
ignore won't get headaches

or
less chance of forgetting
allow lower dose of hormone
allow fewer side effects
ignore only contains one hormone

1

[8]

Q13.

(a) don't kill pathogens / bacteria / viruses / microbes / microorganisms
allow don't contain antibiotics
ignore antibodies / attack / fight
allow <u>only</u> treat symptoms / pain
ignore kill disease / germs

1

(b) any **two** from:

- age
- gender
- extent / severity of pain
  or how long had pain <u>before trial</u>
- type of pain / illness / site of pain
  *accept 'the pain' for **1** mark, if neither extent or type given*
  ignore pain threshold
- (body) mass / weight / height
  allow body size / physique
- other medical issues / drugs taken / health / fitness
- ethnicity

STEMUP.CO.UK

2

(c) (i) 75

ignore calculations / %

1

(ii) faster pain relief / decrease

allow pain relief sooner
***or** it works quicker*

***or** more pain relief at start / in first 1 / 1 $\frac{3}{4}$ hours*

1

(iii) decrease of pain higher / more

ignore more effective unless qualified by time > 1 $\frac{3}{4}$ hours allow effect lasts longer

1

decrease of pain is longer lasting

1

(d) any **three** from:

ignore yes or no

(Yes because)

- rapid pain relief (from A)
- long lasting pain relief (from B)
- and it costs less
- the sum of the pain relief (from A + B) is greater (than X)

(No because)

- drug X gives more pain relief
- (A + B / they) might interact with each other
- could result in overdose
- could be more / new side effects

if neither points gained
allow (more) dangerous

3

[10]

Q14.

(a) in sequence:

2 = tissue(s)

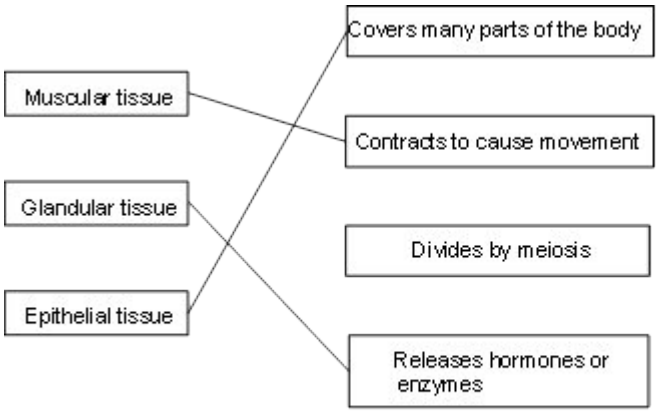
3 = organ(s)

STEMUP.CO.UK

4 = system(s)

1

(b)



***1** mark for each correct line*
extra line(s) from one tissue cancel

3

[4]

Q15.

(a) (i) A

1

(ii) hydrochloric (acid) / HCl

1

(iii) alkali / suitable named example
accept sodium hydrogen
carbonate / sodium bicarbonate / milk of magnesia / other brand names
allow bile (salts)
ignore antacid

1

(b) • amylase breaks down starch

1

• (broken down) into sugars / glucose

1

• digestion of starch in the mouth

1

• (also) starch broken down in small intestine

1

• amylase produced in salivary glands / small intestine / pancreas

1

(c) small intestine
allow ileum / duodenum

STEMUP.CO.UK

*do **not** accept large intestine*

1

[9]

Q16.

(a) LHS: carbon dioxide **AND** water

in either order

*accept CO_2 **and** H_2O*
allow CO2 and H2O
if names given ignore symbols

*do **not** accept CO^2 / H^2O / Co / CO*
ignore balancing

1

RHS: sugar(s) / glucose / starch / carbohydrate(s)

accept $C_6H_{12}O_6$
allow C6H12O6
*do **not** accept $C^6H^{12}O^6$*

1

(b) (i) light is needed for photosynthesis

or

no photosynthesis occurred (so no oxygen produced)

1

(ii) oxygen is needed / used for (aerobic) respiration

full statement

*respiration occurs **or** oxygen is needed for anaerobic respiration gains **1** mark*

2

(c) (i) (with increasing temperature) rise then fall in rate

1

use of figures, ie

max. production at 40 °C
or maximum rate of 37.5 to 38

1

(ii) <u>25 – 35 °C</u>

either faster movement of particles / molecules / more collisions
or particles have more energy / enzymes have more energy

1

or temperature is a limiting factor over this range

<u>40 – 50 °C</u>

denaturation of proteins / enzymes

ignore denaturation of cells
ignore stomata

1

STEMUP.CO.UK

(d) above 35 °C (to 40 °C) – little increase in rate
or > 40 °C – causes decrease in rate

1

so waste of money **or** less profit / expensive

1

because respiration rate is higher at > 35 °C
or
respiration reduces the effect of photosynthesis

1

[12]

Q17.

(a) any **two** from:

ignore eating disorder
ignore cancer

- arthritis
  accept worn joints
- diabetes
  accept high blood sugar
- high blood pressure
  ignore cholesterol
- heart disease / heart condition / heart attack / blood vessel disease
  allow blood clots / strokes

2

(b) (i) $\frac{1}{4}$ **or** 0.25 **or** 25%

*correct answer gains **2** marks*
*if answer incorrect, evidence of 1500 ÷ 6000 gains **1** mark*
*25 without % gains **1** mark*

2

(ii) majority / most / high proportion of people in trial lost mass / weight

ignore good results / it worked

1

[5]

Q18.

(a) (i) 129

1

(ii) 9

accept calculated difference between answer to (a)(i) and 120

1

(b) less energy / power used

STEMUP.CO.UK

allow less fuel / named fuel used

ignore cost

1

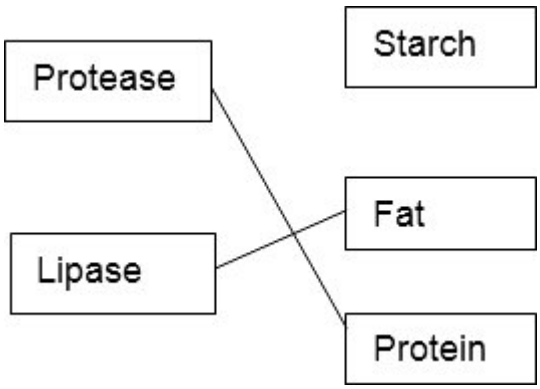
less pollution / carbon dioxide
or less hot water / less heat released

allow less global warming / carbon emissions or reduced carbon footprints

*do **not** accept secondary effects alone, eg less melting of ice caps*

1

(c) (i)



***1** mark for each correct line*

*do **not** accept two lines from an enzyme*

2

(ii) denatured

if no answer on the line accept a clear indication of correct answer in the box

1

[7]

Q19.

(a) protease

allow trypsin / peptidase

*do **not** allow pepsin*

1

carbohydrase / amylase

*do **not** allow sucrase / maltase / lactase*

1

(b) no lipase produced / found

1

in stomach / mouth / before small intestine
OR
accept lipase only produced / found (1)
in small intestine / pancreas (1)

*if no other mark is awarded lipid is not broken down in the stomach **or** lipid is digested in small intestine gains **1** mark*

1

STEMUP.CO.UK

(c) enzymes only work in solution / when dissolved
or
because enzyme / lipase / it is dry

*allow enzymes only work in presence of water **or** enzymes do not work when dry*

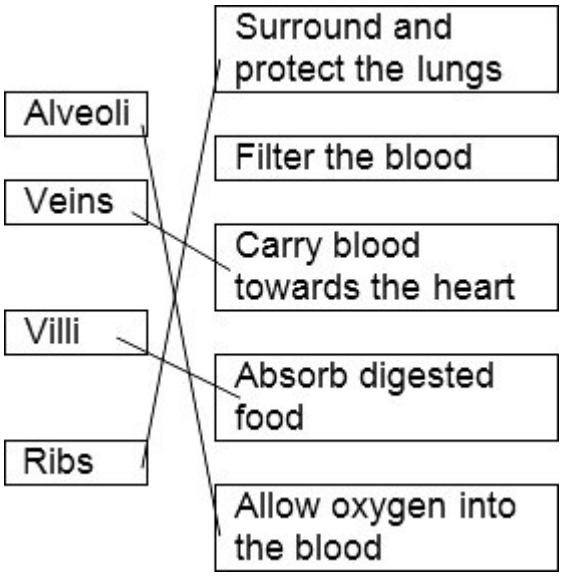
ignore other physical conditions

1

[5]

Q20.

(a)



*4 correct = **4** marks*

*3 correct = **3** marks*

*2 correct = **2** marks*

*1 correct = **1** mark*

extra line from a structure cancels the mark

4

(b) diffusion

1

[5]

Q21.

any **two** from:

- arthritis

  ignore descriptions

- diabetes
- high blood pressure
- heart / blood vessel disease

  ignore cholesterol

[2]

STEMUP.CO.UK

Q22.

(a) (i) any **two** from:

- fibres not damaged
- machines last longer / machines not damaged by stones
- shorter time **or** quicker
- lower temperature
  allow cheaper / uses less energy as an alternative to shorter time / lower temperature, if these not given

2

(ii) any **two** from:

- different enzymes (for different dyes)
- enzymes expensive
  no mark for expensive alone
- enzymes have to be removed (from denim material) (after washing / treatment)

2

(b) protease

1

[5]

Q23.

(a) shape changed / destroyed (above 45 °C)
accept denatured
accept active site changed
*do **not** accept enzyme killed*

1

(shape) doesn't fit (other molecules / stain)

1

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

- can wash the clothes at higher temperature
- so wash / enzyme action will be quicker
  *do **not** accept idea of bacteria working faster*
- enzyme not destroyed at high temperature / 80 °C
  accept denaturation or description

2

(ii) high(er) temperature / 80 °C uses more energy / fuel

1

more pollution / named (eg carbon dioxide / global warming) (from electricity production)

STEMUP.CO.UK

or

increased release of hot water (into the environment)

1

[6]

Q24.

(a) (i) capillary

1

(ii) diffusion

1

(b) (i) Z

ignore any names

1

(ii) large / increased surface / area / **or** to absorb <u>more</u> food **or** improved diffusion

allow all food absorbed

1

[4]

Q25.

(a) (i) 18

1

(ii) Z

1

(b) (i) red blood cells

1

(ii) haemoglobin

1

[4]

Q26.

(a) (i) brain

1

(ii) skin

1

(iii) 1/25 **or** 4% **or** 0.04 **or** 1 in 25 **or** 1:25 **or** 1 out of 25

allow $\frac{1000}{25000}$

1

(b) any **two** from:

- increased / high heart rate / pulse rate

*do **not** allow pumps more blood unqualified*

STEMUP.CO.UK

- dilation / widening of <u>arteries / arterioles</u> (to skeletal muscles)
  accept vasodilation unqualified
  *do **not** accept reference to veins / capillaries*

  or
  less blood flow to other organs

- increased stroke volume / described

2

(c) *ignore references to breathing*

<u>more</u> respiration / description
or
<u>more</u> energy required **or** to provide <u>more</u> energy

1

respiration / process described → CO_2
*do **not** accept anaerobic respiration*

1

CO_2 <u>diffuses</u> into blood

1

[8]

Q27.

(a) <u>large</u> surface / <u>large</u> area

1

thin / short distance (from air to blood) / one cell thick / two cells thick

1

<u>good</u> blood supply / <u>many</u> capillaries / capillary <u>network</u> / <u>many</u> blood vessels
ignore moist surface

1

(b) (i) diffusion
ignore gaseous exchange

1

(ii) brings (more) oxygen / air into the <u>lungs</u> / <u>alveoli</u>

1

keeps O_2 level high in alveoli

or

maintains concentration difference (between alveoli and blood) / keeps O_2 concentration in alveoli > O_2 concentration in blood gains **2** marks

1

[6]

Q28.

(a) any **two** from:

- (high) CRP / protein

STEMUP.CO.UK

- (no) heart condition
  allow health
- (not high) LDL
- over 50 / age
- number of tablets (each day)
  ignore time
  ignore placebo / rosuvastatin
  ignore number of people

2

(b) any **one** from:

- tablet with no drug
  allow fake (pill) / dummy (pill) / sugar / chalk (pill)
- tablet that has no effect
  allow drug that has no effect
- tablet without chemicals
  ignore vitamin / mineral pill
- tablet that people thought contained statin **or** reference to psychological effect
  ignore control / different statin

1

(c) 17802 / large number of people **or** enough people
ignore control group / fair test / control variables
ignore time / repeats

1

(d) any **one** from:
ignore cost

- placebo group at risk of heart attack **or** to allow statin to be given to everyone
- statin group 54% less likely to get heart attack **or** showed that statin worked **or** showed trial (very) successful
  ignore reliable
- sufficient information gained / results conclusive
  ignore got results early
- unethical / unfair to carry on trial

1

(e) to avoid bias **or** show impartiality **or** show results independent
allow manufacturers could cheat
ignore reliability
ignore could be sued / blamed if trial went wrong
ignore manufacturer would know which group got statin / placebo

1

STEMUP.CO.UK

(f) any **two** from:

- reduction in LDL
  *allow improves LDL:HDL balance **or** LDL and HDL concentrations equal*
  ignore less cholesterol
  ignore more HDL
  *do **not** accept less HDL*
- reduction in (saturated) fats
- reduces deposition of fat / cholesterol / LDL in walls of blood vessels **or** blood vessels less likely to be blocked with fat / cholesterol / LDL

2

[8]

Q29.

(a) any **one** from:

*ignore reference to recording results every 5 minutes **or** concentrations of lipid / lipase*

- (same) volume / amount / 1 cm^3 lipase
  allow amount of solution
- (same) volume / amount / 5 cm^3 lipid
  allow keep same volumes in the test tubes
- mixed after 3 minutes / same time before mixing
  *do **not** accept temperature*

1

(b) so that the lipase and the lipid reached the right temperature

1

(c) any **two** from

ignore explanations

- decrease in time **or** faster (breakdown)
- then increase in time **or** then slower (breakdown)
- fastest / least time / optimum at 35°C

2

(d) any **two** from:

ignore 'test at more temperatures' unqualified

- test more regularly eg test every minute
  any interval < 5min
- test at smaller temperature intervals
  any value <15°C
  allow test more temperatures in the range

STEMUP.CO.UK

- test between 50 (°C) and 95 (°C)
  any value in range, eg test at 70

- repeat at same temperatures
  or repeat the investigation
  or compare results with others
  *allow do **it** again*

2

(e) (i) (lipase / it) denatured / destroyed / changed shape
allow damaged / deformed
*do **not** accept killed*
ignore broken (down)

1

(ii) fatty acids and glycerol

1

[8]

Q30.

(a) (i) cholesterol

1

fat
in this order

1

(ii) mycoprotein has (approx) half amount of protein / has 11.8 (g) protein while chicken has 22.0 (g)
accept has less protein
ignore less fat

1

(b) (i) increased

1

(±) constant rate **or** (from 0) to 9.2 / by 9.2(cm) **or** about 1 cm a day **or** increase slower at the beginning and / or at the end

1

(ii) species **A** grows faster / more than species **B**
or
species **A** has larger diameter **or** is bigger
or
the growth of species **B** slows down after 6 weeks
accept use of approximate figures

1

(c) any **two** from:

- pH / acidity / alkalinity
  ignore references to carbon dioxide / waste products

- (speed of) stirring
  ignore time in the fermenter

STEMUP.CO.UK

- oxygen (concentration) / aeration
  ignore initial amount of Fusarium
- ion <u>concentration</u> / named eg -NH_4^+
  allow ammonia
- pressure

2

[8]

Q31.

(a) blood has red (blood) cells / haemoglobin

1

<u>haemoglobin</u> combines with / carries oxygen
ignore 'mix'
***NB** Blood can form oxyhaemoglobin = **2** marks*

1

(b) blood <u>gains</u> oxygen / becomes oxygenated (in the lungs)
idea of acquiring oxygen must be unambiguous

1

blood loses oxygen to the muscles / cells

1

because muscles are respiring (aerobically)

1

to provide energy (for exercise)

1

[6]

Q32.

D – *many* microvilli (1)
Ex – provide large surface area (1)
***five** points made*
*max **3** descriptions*
*max **3** explanations*

D – *many* capillaries / *good* blood supply (1)
Ex – maintain concentration / diffusion gradient **or** quickly removes food (1)

D – thin wall / one cell thick surface / capillaries near surface (1)
allow villi are thin
ignore villi are one cell thick

Ex – short distance for food to travel (1)

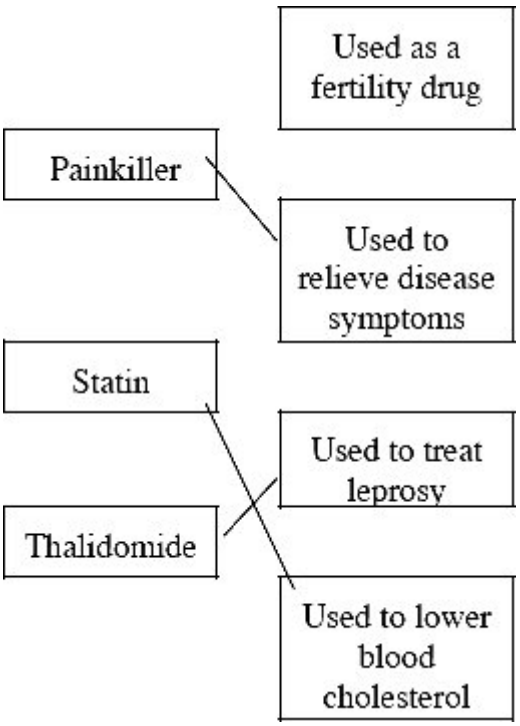
D – *many mitochondria (1)*
Ex – provide energy / ATP for active uptake / transport (1)

[5]

STEMUP.CO.UK

Q33.

(a)



*all three correct = **3** marks*
*two correct = **2** marks*
*one correct = **1** mark*
extra line from a statement cancels the mark

3

(b) (i) 8

1

(ii) 3210

1

(c) (i) if it is toxic

1

(ii) if it has side effects

1

[7]

Q34.

(a) fatty acids

1

glycerol

1

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

- (same) amount / $1cm^{3}$ fat
- (same) amount / $10cm^{3}$ lipase / enzyme

STEMUP.CO.UK

- (kept for) 24 hours **or** (same length of) time

1

(ii) temperature

allow heat / warmth

1

(c) (carry out experiments) using more temperatures / smaller intervals

ignore repeat unqualified

do not accept longer time

1

between 20 and 60 °C / around 40 °C

accept extra single temperature in range 20 °C – 60 °C but cannot be 20 °C, 40 °C or 60 °C

1

(d) (i) 'strong' acid

1

(ii) enzyme works / not destroyed / not denatured / not damaged

*do **not** accept enzyme not killed*

accept any indication that the fat is digested

accept same as tube 3 / tube at 40 °C

accept optimum temperature / at or near body temperature

1

[8]

Q35.

(a) pancreas

either order

1

small intestine

1

(b) any **two** from:

- to give them time to come to temperature of the water-bath

  accept so (they / both) are at the same temperature

- at / near body temperature / best / optimum temperature

- otherwise reaction would take place at a series of different temperatures **or** sensible statement about control / fair test

2

(c) (i) 0.42

allow in range 0.42 to 0.425

1

(ii) 0.021

correct answer with or without working

*allow ecf from (c)(i) ie (c)(i) ÷ 20 correctly calculated for **2** marks*

STEMUP.CO.UK

if answer incorrect 0.42 ÷ 20 ***or*** *(c)(i) ÷ 20 gains* ***1*** *mark*

2

(iii) (all) starch digested / gone / used up / turned to sugar

allow the amount of sugar stays the same / maximum

1

(iv) any **two** from

allow reference to active site once only as alternative to first or second bullet point

- enzyme destroyed / denatured / damaged / shape changed
  do ***not*** *accept killed*
- unable to fit (starch molecule)
- starch can't be digested
  enzymes don't work is insufficient

2

[10]

STEMUP.CO.UK