

MARK SCHEME

GCSE

BIOLOGY

AQA - TRIPLE SCIENCE

B 2 - TEST 5
ORGANISATION
Advanced

Mark schemes

- 1.** A + B most effective (treatment)
ignore descriptions of LDL levels 1
- D is (the most) effective (treatment)
D is the best single (treatment) 1
- neither A nor B (alone) are effective
allow increase risk of heart disease instead of not effective 1
- can't tell if C is effective
OR
A + C is not effective 1
- [4]**
- 2.** pancreas produces lipase
which breaks down / digests fats into fatty acids and glycerol
liver produces bile / hydrogen carbonate
which neutralises acids / makes alkaline
provides optimum / best / most effective pH for lipase / enzyme action
bile emulsifies fats / description
increasing the surface area for lipase / enzyme to act on
any five for 1 mark each
(digestion is in stomach / liver / pancreas – penalise only once) 5
- [5]**
- 3.** (a) guard cell
ignore stoma / stomata 1
- (b) Species A :
allow converse points for species B
- stomata open in dark / at night **or** close in light / in day 1
- stomata closed during warm(est) period **or** open when cool(er) 1
- heat (energy) / warmth increases evaporation / transpiration
must give explicit link between heat and transpiration 1
- reduces water loss / evaporation / transpiration
ignore photosynthesis 1
- [5]**

4.

(a) (substance / chemical) that affects body chemistry / chemical reactions in the body

1

(b) statin / aspirin / neither recommended

no mark, may be implied. If no recommendation or implication, max 4 marks

answers should be comparative

any **five** from:

- argued evaluation in favour of aspirin or statin or neither

answers could include reference to

*accept converse for statins / aspirin but **not** as advantage of one **and** disadvantage of other*

for statins:

- more people in studies
- so data / findings more repeatable
accept reliable for repeatable
ignore accurate / precise
- reduces cholesterol but aspirin doesn't
allow reduces cholesterol but no evidence about aspirin
- aspirin (may) causes bleeding / poor clotting but statins do not
allow aspirin causes bleeding / poor clotting but no evidence about statins
- smaller (total) percentage suffer side-effects
- monitored by doctor, aspirins not

for aspirin:

- cheaper
- can be bought over the counter rather than prescribed
- statins cause serious damage / muscle damage / kidney failure but aspirins do not

similarities:

- both have similar effect on reducing (non-fatal) heart attacks
- incidence of side-effects low in both
allow (for aspirin) higher reduction of risk of heart attack

5

[6]

5.	<p>(a) shape changed / destroyed (above 45 °C) <i>accept denatured</i> <i>accept active site changed</i> <i>do not accept enzyme killed</i></p>	1	
	<p>(shape) doesn't fit (other molecules / stain)</p>	1	
	<p>(b) (i) any two from:</p> <ul style="list-style-type: none"> • can wash the clothes at higher temperature • so wash / enzyme action will be quicker <i>do not accept idea of bacteria working faster</i> • enzyme not destroyed at high temperature / 80 °C <i>accept denaturation or description</i> 	2	
	<p>(ii) high(er) temperature / 80 °C uses more energy / fuel</p> <p>more pollution / named (eg carbon dioxide / global warming) (from electricity production)</p> <p>or</p> <p>increased release of hot water (into the environment)</p>	1	
			[6]
6.	<p>(a) allow carbon dioxide to enter / gaseous exchange (oxygen neutral) (transpiration neutral) <i>for one mark</i></p>	1	
	<p>(b) guard (cells) <i>for one mark</i></p>	1	
	<p>(c) stops / reduces the rate of water loss / transpiration (<i>reject</i> if dark initiated) stops / reduces wilting / description e.g. drooping / maintains turgor <i>for 1 mark each</i></p>	2	
			[4]
7.	<p>(a) digested / broken down / made soluble by protease enzyme in stomach in small intestine / from stomach / from pancreas into amino acids amino acids / small molecules absorbed into blood <i>any four for 1 mark each</i></p>	4	

- (b) *ideas that*
 lipase / enzyme works best in alkaline / neutral conditions
 acid denatures or inactivates enzyme / inhibits enzyme activity
 bile emulsifies fat / bile produces larger surface area of fats / bile alkaline
for enzyme to work on / which increase activity of enzymes
any three for 1 mark each

3

[7]

8.

- (a) (i) doesn't have valves

allow veins have valves

1

has a thicker wall **or** thicker layer of muscle

allow has a smaller lumen

ignore references to elastic (in walls)

1

- (ii) any **two** from:

- (artery has) more oxygen
- (artery has) more glucose
- (artery has) less carbon dioxide
- (artery has) less lactic acid

ignore urea

ignore reference to pressure

accept converse for veins if veins is clearly stated

2

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

- no rejection
allow no tissue matching required
- abundant supply
- low risk of infection
allow named example ie HIV, CJD
- longer shelf life
allow less space needed for storage
ignore side effects

2

[6]

9.

- (a) salivary glands and pancreas

1

- (b) starch / substrate fits into active site (of enzyme) 1
- shape of active site is unique / complementary to substrate
allow converse
- or**
 substrate is specific to active site / enzyme
allow enzyme has a high specificity for substrate 1
- bonds (within starch / substrate
or
 between sugar molecules) are broken 1
- (c) converted to new carbohydrates / glycogen / named organic compound (e.g. protein / fat) 1
- (d) to allow (the starch and amylase / solutions) to equilibrate (to the temperature of the water bath)
or
 to get the starch and amylase / solutions to the same temperature / 20 °C
or
 to get the starch and amylase / solutions to the (same) temperature of the water bath 1
- (e) **40 °C**
 all wells contain a symbol
and
 must contain at least two crossed (✖) wells at the end
allow final three wells crossed
 (✖) 1
- 60 °C**
 all wells contain a symbol
and
 must have fewer crossed (✖) wells at the end than at 40 °C
allow all wells ticked (✓)
*for either mp do **not** allow a crossed well followed by a ticked well* 1
- (f) more accurate
allow (so) closer to (the) true value 1
- (because) it is a quantitative measure
allow (it's) an actual value as opposed to an opinion
or
 less / not subjective
allow colour is only qualitative 1

- (g) 0.07 (%) 1
- (h) starch is broken down less quickly (at 20 °C) 1
allow converse
- because, at 20 °C, substrates / enzymes / molecules have less (kinetic) energy 1
- (i) 1.08 (arbitrary units) 1
- at 80 °C, enzyme / amylase has denatured
allow description of denaturation
do not allow enzyme is killed 1
- so starch is not broken down (at all)
allow the concentration of starch is still 0.5% 1

[16]

10.

- (a) stomach and pancreas correctly labelled 1
- (b) bacteria not killed (by stomach acid / HCl) and so they damage mucus lining 1
 so acid / HCl damages stomach tissue / causes an ulcer
allow bacteria infect stomach tissue 1
- (c) if the cancer is malignant 1
 (cancer) cells can spread to other organs 1
 via the blood forming a secondary tumour
do not award marking points 2 or 3 without marking point 1 1
- (d) add Biuret reagent to food sample
allow sodium / potassium hydroxide (solution) + copper sulfate(solution) 1
 mauve / purple colour shows protein present 1
- (e) damaged villi reduce surface area for absorption (of food molecules) 1
 (therefore) fewer amino acids and glucose absorbed 1

with less glucose transfer of energy from respiration is reduced

1

and fewer amino acids available to build new proteins

1

[12]