

MARK SCHEME

GCSE

BIOLOGY

AQA - TRIPLE SCIENCE

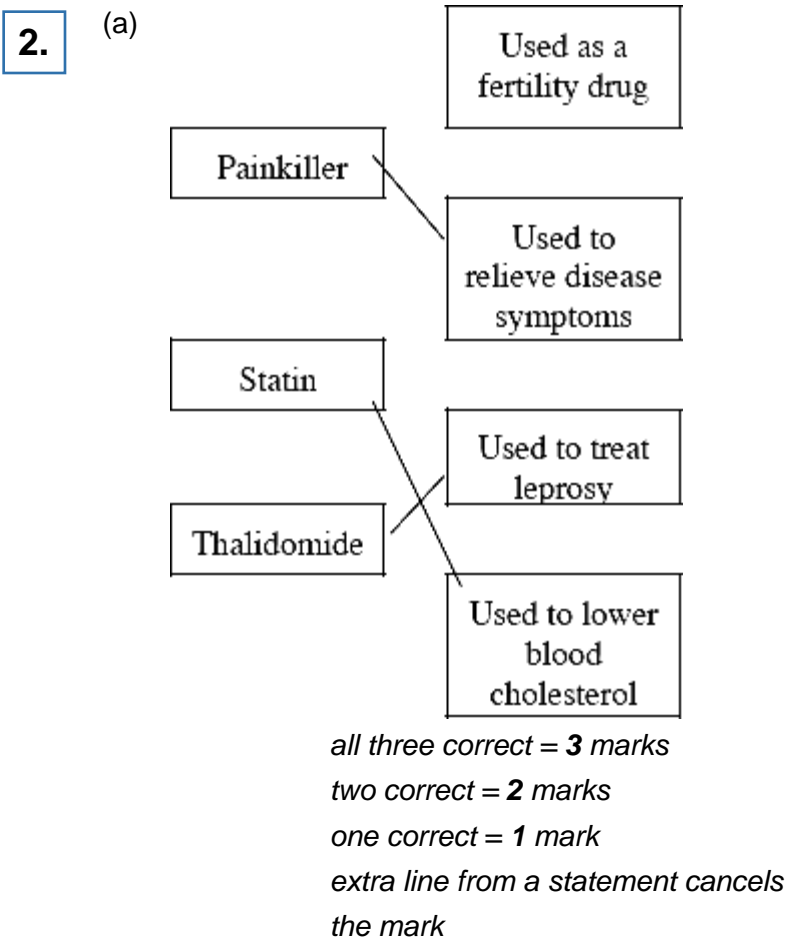
B 3 - TEST 4

INFECTION

Intermediate

Mark schemes

- 1.** (a) (i) diagram shows extensions of intact cell membrane around viruses 1
- (ii) antibodies 1
allow enzymes re (ii)
allow interferon
ignore antitoxins / proteins
- (b) virus is transferred 1
- (virus in) blood / body fluids – transfer (via needles) 1
- [4]**



- 3
- (b) (i) 8 1
- (ii) 3210 1
- (c) (i) if it is toxic 1

(ii) if it has side effects

1

[7]

3.

(a) hearsay

1

(b) (volunteers with feet in) empty bowls

accept bowl with no (iced) water

*do **not** accept mention of bowl with iced water*

1

(c) any **three** from:

ignore control variables, eg age, gender

- only some of those whose feet were in cold water caught colds
- some controls caught colds
- only feet were cold in experimental group
allow (control) not wrapped up warm
- only kept feet in cold water for 20 minutes
- insufficient evidence for 'proof' / only showed increased risk
allow small sample size
- don't know activities of individuals before / after the investigation
(eg exposure to cold virus) / reference to immune system
allow investigation done in 'cold season'

3

[5]

4.

(a) **A**

1

(b) **D**

1

(c) use the same type of plant

or

give equal amount of water to each plant

ignore size of pot

1

(d) (advantage) more minerals

1

(disadvantage) cost / not free

1

[5]

5.

(a) a fungus

1

(b) **Level 3 (5-6 marks):**

Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account.

Level 2 (3-4 marks):

Relevant points (reasons / causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.

Level 1 (1-2 marks):

Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.

Level 0

No relevant content

Indicative content

	defence	description of defence
animals	skin	sebum / oils to kill microbes dead layer difficult to penetrate
	nose	hairs keep out dust and microbes
	trachea / bronchi	mucus traps microbes cilia moves mucus
	stomach	(hydrochloric) acid kills bacteria
	white blood cells	produces antibodies produces antitoxins engulf microbes / phagocytosis
plants	cell wall	tough / difficult to penetrate
	waxy cuticle	tough / difficult to penetrate
	dead cells / bark	fall off, taking pathogens with them
	production of antibacterial chemicals	kill bacteria
fungi	antibiotic production	kill bacteria

- (c) any **three** from:
- sterilise agar (before use)
 - sterilise (Petri) dish before use
 - disinfect bench (before use)
 - pass inoculating loop (through flame)
 - secure lid with (adhesive) tape
 - minimise exposure of agar / culture to air / lift and replace lid as quickly as possible

allow:

- *dip loop into ethanol (after flaming)*
 - *keep the lid on the plate for as long as possible*
- or**
- minimise exposure of agar to air*
- or**
- *only tilt the lid off (rather than remove it)*
 - *flame the neck of the bottle*

3

- (d) to prevent the growth of a harmful pathogen

1

[11]

6.

- (a) don't kill pathogens / bacteria / viruses / microbes / microorganisms

allow don't contain antibiotics

ignore antibodies / attack / fight

allow only treat symptoms / pain

ignore kill disease / germs

1

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

- age
- gender
- extent / severity of pain
or how long had pain before trial
- 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

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]

7.

(a) toxins / poisons (secreted by / from / in bacteria)

1

- (b) any **two** from:
- wash hands after using toilet / being sick
or
wash hands before preparing / handling food
or
do not prepare food (whilst infected)
ignore 'wash hands' unqualified
ignore reference to coughing / sneezing
 - isolate yourself
allow examples of how isolation could be achieved
 - disinfect clothes / surfaces
 - do not share utensils / cutlery / towels
- 2
- (c) antibiotics
allow named examples of antibiotics
- 1
- (d) immune system is damaged / weakened **or** immune system doesn't function properly
allow immunocompromised
allow lack of / no white blood cells
- 1
- white blood cells cannot kill bacteria / *Salmonella* (as effectively)
allow no / fewer antibodies so bacteria not killed or less phagocytosis so bacteria not killed or no / fewer antitoxins to counter toxins
- 1
- (e) any **one** from:
- (give chickens) antibiotics
allow (give chickens) monoclonal antibodies
 - don't sell infected chickens / eggs
allow don't sell the chickens / eggs
ignore don't sell chickens / eggs
 - keep infected chickens isolated / indoors
allow keep the chickens indoors
ignore keep chickens indoors
 - slaughter the infected chickens
ignore vaccination / chlorination / disinfection
- 1

(f) (cleaning liquid) B
and
greater reduction in number of bacteria (after cleaning) in both locations
ignore few bacteria in both locations
*allow neither / both **and** idea of experimental error*

1

(g) radius (of area with no bacteria growing)
allow diameter (of the area with no bacteria growing)
ignore πr^2 unqualified
allow idea of placing agar plate onto graph paper and counting the squares not covered with bacteria

1

(h) repeat **and** look to see if results are similar
ignore repeat unqualified
*allow repeat **and** look to see if results are different*
allow repeat and see if there are anomalies
ignore repeat and identify anomalies
ignore repeat and compare unqualified

1

(i) any **one** from:

- toxicity / side / health effects
ignore harmful / dangerous
allow reference to allergies
- effect on other types of bacteria / pathogens
allow not tested on other types of bacteria
ignore germs
- interaction with other cleaners
- ease of use
- dilution factor of each cleaner (vs. cost)
ignore concentration unqualified
- time cleaner is effective for
ignore how long the cleaner lasts for
allow reference to odour of cleaning liquid
ignore reference to cost unqualified
ignore environmental effects / flammability

1

[11]