

# GCSE

BIOLOGY

AQA - COMBINED SCIENCE

MARK SCHEME

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B3

INFECTION & RESPONSE

TEST 1

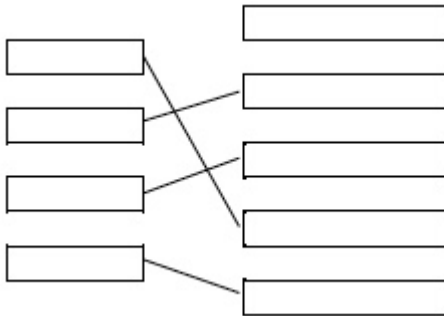
## Mark schemes

**1**

(a) salmonella

1

(b)



1  
1  
1  
1

(c) lower concentration of antibiotic / chemical further from the fungus  
*allow less antibiotic / chemical further from the fungus*

1

(d) lead to mass production of antibiotics  
**or**  
lead to development of other antibiotics

1

reduced infection by bacteria  
**or**  
antibiotics have saved many lives

1

**[8]**

**2**

(a) a disease that can be spread from one person to another

1

(b) gonorrhoea

1

(c) antibiotics

1

(d) painkillers

*allow aspirin, paracetamol, ibuprofen and other correct brand names*

1

(e)

<b>Level 2:</b> Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.	3-4
<b>Level 1:</b> Facts, events or processes are identified and simply stated but their relevance is not clear.	1-2
No relevant content	0
<b>Indicative content</b> <ul style="list-style-type: none"><li>• skin stops the bacterium (entering the body)</li><li>• blood clots to stop bacteria entering (through cuts)</li><li>• stomach acid will kill the bacterium (if it is in food)</li><li>• nose / trachea have mucus to trap the (tuberculosis) bacteria</li><li>• nose / trachea have cilia / hair to move mucus out</li><li>• white blood cells destroy the bacteria if infected</li><li>• by phagocytosis</li><li>• by antibodies</li><li>• by antitoxins</li></ul>	

4

[8]

3

(a) cell membrane

*extra ticks negates marks*

1

(b) engulf pathogens

1

produce antibodies

1

produce antitoxins

1

*extra ticks negates marks*

(c) 2050 – 100

1

= 1950

*allow 1 mark for a correct subtraction of incorrect values*

1

*an answer of 1950 scores 2 marks*

(d) any **one** from:

- (more) people vaccinated  
*ignore injections / treatments / medicines unqualified*  
*allow vaccine produced*  
*allow (more people given) MMR (vaccine)*  
*do **not** allow antibiotics*  
*ignore less people infected*
- (more) people immune
- no new measles strain

1

(e) any **one** from:

- measles is (caused by) a virus  
*allow measles is not caused by a bacterium*
- viruses cannot be killed / destroyed by antibiotics  
*allow antibiotics **only** kill / destroy bacteria*  
*ignore harmed / treated*

1

(f) any **one** from:

- use of a barrier method of contraception  
*ignore use of diaphragm*
- use of a condom  
*ignore use protection / safe sex*
- vaccination / immunisation
- avoid sexual intercourse / contact  
*do **not** accept less sexual intercourse / contact*

1

(g) any **one** from:

- size / shape/ type of paper disc  
*ignore paper disc unqualified*
- concentration of antibiotic  
*allow strength / dosage of antibiotic*
- volume / amount of antibiotic
- (incubation) time  
*allow 3 days*
- (incubation) temperature  
*ignore size of petri dish*

1

- (h) to check that the disc / water did not have an effect  
**or**  
to make sure it was the antibiotic that had an effect  
*allow for comparison with the antibiotics*  
*allow as a (experimental) control*  
*do **not** accept as a control variable*

1

- (i) (antibiotic) **A**  
*no marks if wrong antibiotic given*

1

any **one** from:

- (antibiotic **A**) had the **largest** clear area around it
- (antibiotic **A**) killed the **most** bacteria

1

[13]

4

- (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  hours**

1

(iii) decrease of pain higher / more  
*ignore more effective unless qualified by time > 1  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]

5

(a) testing for toxicity / see if it is safe / see if it is dangerous / to see if it works  
*ignore side effects unqualified*

1

(b) (i) testing for side effects / testing for reactions (to drug)  
*ignore to see if it works*  
*do **not** accept dosage*

1

- (ii) any **one** from  
*ignore immune system*
- dose too low to help patient
  - higher risk for patient
  - might conflict with patient's treatment / patient on other drug
  - effect might be masked by patient's symptoms / side effects clearer
- 1

- (c) to find optimum dose  
*allow testing on larger sample **or** it makes results more reliable*  
*allow to find out if drug is effective /find out if drug works on ill people (not just if drug works)*
- 1

- (d) (i) (tablet / drug / injection) that does not contain drug  
*allow control / fake / false*  
*allow tablet / injection that does not affect body*  
*do **not** accept drug that does not affect body*
- 1

- (ii) neither patients nor doctors
- 1

**[6]**

6

- (a) kills / destroys bacteria / MRSA  
*do **not** allow germs*
- 1

- prevents / reduces transfer  
*allow stops MRSA entering ward*
- 1

- (b) mutation  
*do **not** accept antibiotics causes mutation*
- 1

- (causes) resistance  
*allow not effective*  
*ignore immunity*
- 1

- to antibiotics
- 1

**[5]**

7

(a) 18.06 / 18 / 18.1

*correct answer gains 2 marks*  
*if answer incorrect evidence of*  
 $(4131 - 3499) \div 3499 \times 100$   
**or**  $632 \div 3499 \times 100$   
**or**  $((4131 \div 3499) \times 100) - 100$   
**or** 0.18  
*gains 1 mark*

2

(b) antibiotics kill non-resistant strain  
**or** resistant strain bacteria survive

*accept resistant strain the successful competitor*  
*do **not** accept intentional adaptation*  
*ignore strongest / fittest survive*  
*ignore mutation*  
*ignore people do not finish antibiotic course*

1

resistant strain bacteria reproduce  
**or** resistant strain bacteria pass on genes

1

population of resistant strain increases **or** proportion of resistant bacteria increases  
*allow high numbers of resistant bacteria*

**or**  
people more likely to be infected by resistant strain (than non-resistant strain)

1

[5]

8

(a) produces toxins / damage cells / reproduce rapidly **or** reproduce in cells  
*ignore invade cells*

1



(b) any **three** from:

- TV crew immune / Indians not immune / Indians have weak(er) immune system  
*ignore resistant*
- TV crew had / produced antibodies / Indians had no antibodies **or** antibody production faster in TV crew
- TV crew had previous exposure to flu / had been vaccinated  
**or**  
Indian tribe had no previous exposure to flu / had not been vaccinated  
*allow immunised*
- Indians caught disease from TV crew  
**or**  
TV crew were carriers (of the virus)

3

[4]