



# **GCSE Biology**

## **Communicable Diseases**

### **Mark Scheme**

**Time available: 50 minutes**

**Marks available: 42 marks**

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## Mark schemes

1.

(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

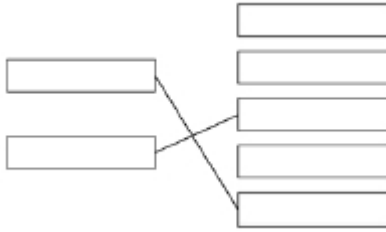
(e) any **one** from:

- (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  $\pi r^2$  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]
2. (a) bacteria
- 1

(b)



*extra line from a drug negates the mark for that drug*

2

(c) any **one** from:

- to check they are safe
- to check they are effective

*allow to check they work or to check for the (right) dose*

- to check for side effects

*allow to check for toxicity*

1

(d) testing on healthy volunteers

1

(e) **Level 2 (3-4 marks):**

Relevant points (reasons / causes) are identified, and there are attempts at logical linking.

**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.

**0 marks:**

No relevant content

**Indicative content**

- dead / inactive pathogen
- introduced to the body
- white blood cells respond
- produce antibodies
- antibodies are specific to pathogen
- antibodies produced quickly (on reinfection) / rapid response
- in larger quantities
- killing the pathogen

[9]

3.

(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**

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

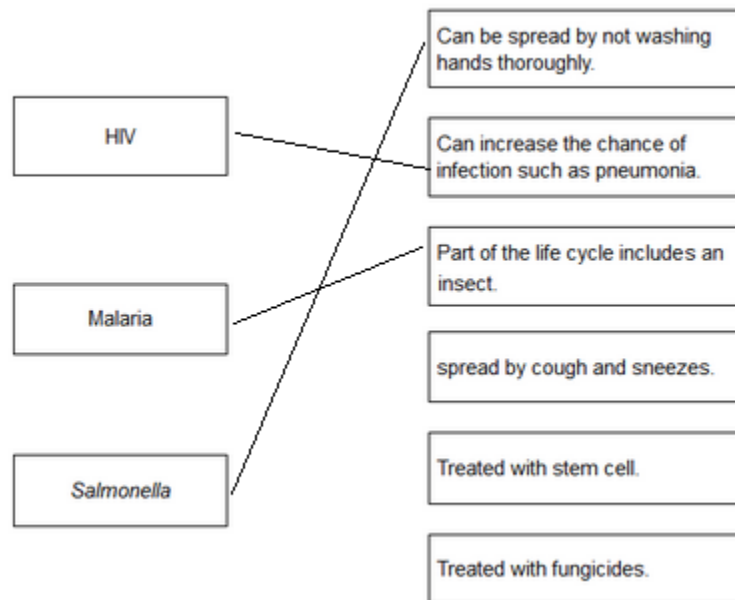
- (d) to prevent the growth of a harmful pathogen

1

[11]

4.

- (a)



*each extra line negates a mark*

4

- (b) pain when urinating

1

yellow discharge

1

- (c) three correct plots

*allow 1 mark for two correct plots*

2

correctly drawn line

1

(d) any **three** from:

- (fairly) level / steady up to 2009  
*allow numbers of males fall (slightly) and females rise (slightly) up to 2009*
- (there is a) rise after 2009
- males are (always) higher than females
- males rising faster than females  
*allow overall increase (from 2005 to 2013)*

3

(e) HIV is a virus

1

(and) antibiotics are only effective against bacteria

**or**

antibiotics do not kill viruses

*allow viruses live inside cells*

1

[13]

5.

(a) to kill virus

**or**

to prevent virus spreading

1

(b) take (stem) cells from meristem

**or**

tissue culture

*allow take cuttings*

1

(c) use Benedict's solution

1

glucoses turns solution blue to orange

1

(d) **Level 2 (3–4 marks):**

A detailed and coherent explanation is provided. The student makes logical links between clearly identified, relevant points that explain why plants with TMV have stunted growth.

**Level 1 (1–2 marks):**

Simple statements are made, but not precisely. The logic is unclear.

**0 marks:**

No relevant content.

**Indicative content**

- less photosynthesis because of lack of chlorophyll
- therefore less glucose made
- so
- less energy released for growth
- because glucose is needed for respiration and / or
- therefore less amino acids / proteins / cellulose for growth
- because glucose is needed for making amino acids / proteins / cellulose

4

**[8]**