

Communicable Diseases

Mark Scheme 1

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Biology
Exam Board	AQA
Topic	4.3 Infection and Response
Sub-Topic	Communicable Diseases
Difficulty Level	Silver Level
Booklet	Mark Scheme 1

Time Allowed: 60 minutes

Score: /60

Percentage: /100

Grade Boundaries:

M1.(a) any **one** from:

- not all deaths recorded
- not all causes of deaths recorded
allow cause may not be known

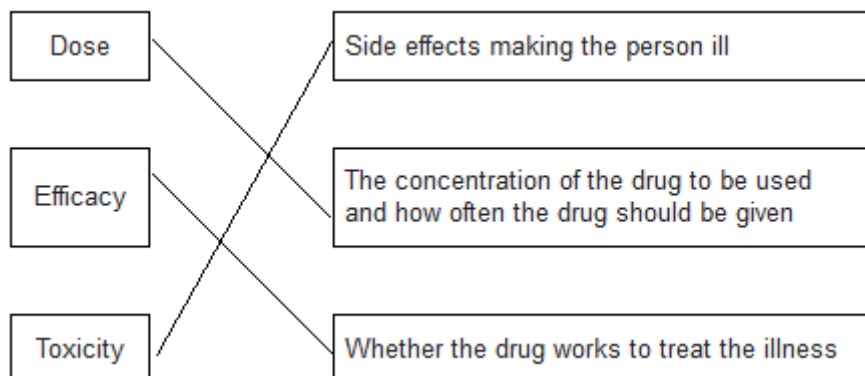
1

(b) antibiotics do not kill viruses

allow antibiotics only kill bacteria

1

(c)



all correct for 2 marks

1 or 2 correct for 1 mark

2

(d) any **one** from:

- to prevent false claims
- to make sure the conclusions are correct / valid
- to avoid bias

1

[5]

M2.(a) 55%

2 marks for correct answer alone

accept 54 – 56

5.5 / 10 × 100 alone gains **1** mark

2

(b) any **three** from:

- amino acids
- antibodies
- antitoxins
- carbon dioxide
- cholesterol
- enzymes
- fatty acid
- glucose
- glycerol
- hormones / named hormones
- ions / named ions
- proteins
- urea
- vitamins
- water.

ignore blood cells and platelets

ignore oxygen

max 1 named example of each for ions and hormones

allow minerals

3

(c) Marks awarded for this answer will be determined by the Quality of Communication (QC) as well as the standard of the scientific response. Examiners should also refer to the information in the Marking Guidance and apply a 'best-fit' approach to the marking.

0 marks

No relevant content.

Level 1 (1 – 2 marks)

There is a description of pathogens with errors or roles confused.

or

the immune response with errors or roles confused.

Level 2 (3 – 4 marks)

There is a description of pathogens **and** the immune response with some errors or confusion

or

a clear description of either pathogens **or** the immune response with few errors or little confusion.

Level 3 (5 – 6 marks)

There is a good description of pathogens **and** the immune response with very few errors or omissions.

Examples of biology points made in the response:

- bacteria and viruses are pathogens
credit any ref to bacteria and viruses
- they reproduce rapidly inside the body
- bacteria may produce poisons / toxins (that make us feel ill)
- viruses live (and reproduce) inside cells (causing damage).

white blood cells help to defend against pathogens by:

- ingesting pathogens / bacteria / (cells containing) viruses
credit engulf / digest / phagocytosis
- to destroy (particular) pathogen / bacteria / viruses
- producing antibodies
- to destroy particular / specific pathogens
- producing antitoxins
- to counteract toxins (released by pathogens)
credit memory cells / correct description
- this leads to immunity from that pathogen.

6

[11]

M3.(a) any **two** from:

- only one 'chromosome'
allow one strand of DNA
- circular
allow loop
- may have plasmids
- not in a nucleus / no nucleus

2

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

- London is much higher
or converse
- more variable / wider range
allow 'on average it is 5 / 6 times greater'

1

- (ii) increases
Included figures must be correct 1
- (iii) overall slight increase
accept 'doesn't change much' 1
- variable / goes up and down 1
- (c) (i) both axes correctly labelled
x = Year
y = Number of cases 1
- correct points
all correct = 2 marks
1-2 errors = 1 mark
> 2 errors = 0 marks 2
- suitable line of best fit
accept straight line or smooth curve 1
- (ii) doesn't fit the pattern / line of best fit 1
- (d) provides immunity / protection (to TB)
ignore 'stops people catching it'

ignore 'resistance'

1

prevents TB spreading
accept ref to herd immunity

1

[13]

M4.(a) (i) decrease

1

rate of decrease slows

1

- (ii) any **one** from:
- more use of disinfectant
allow any reasonable increase in hygiene or sterilisation precautions
 - more use of hand washing
 - more careful / more often cleaning of patient facilities
 - raised awareness / education about hygiene

1

Explanation:
stops / reduces the bacteria being transferred / spreading

1

(iii) $800 - 500 / 800 \times 100 =$

1

37.5 (%)

correct answer with or without working gains 2 marks

1

(iv) any **one** from:

- numbers quite low now so hard to reduce further
- was a big campaign / much publicity (in 2009) so more people already doing it
- hygiene / cleaning now good so hard to improve
- hospitals short of money so less staff to clean

1

- (b) mutation occurred giving resistance (to methicillin)
*do **not** accept overuse caused mutation*

1

resistant bacteria not able to be treated / not killed

1

these bacteria multiplied / reproduced / spread quickly

1

[10]

M5. (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]

- M6.** (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 $1\frac{3}{4}$ 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)

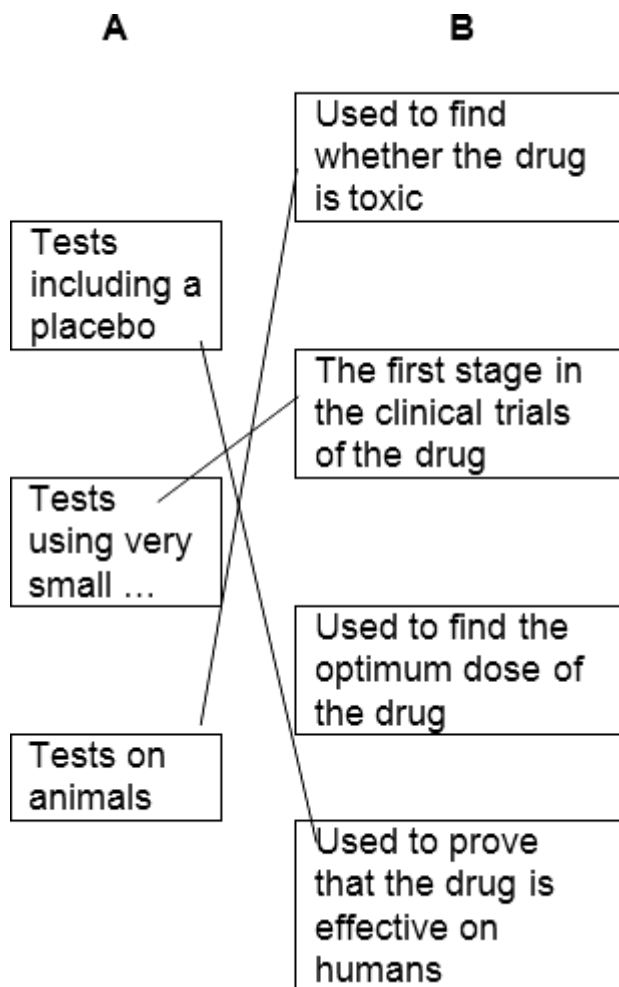
(No because)

- 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]



M7. (a)

1 mark for each correct line

mark each line from left hand box

two lines from left hand box cancels mark for that box

3

(b) any **three** from:

Students have been informed that the headline is not justified

- reference to reliability, eg only a small number of mice tested
or trial too short
or investigation not repeated
- reference to control, eg mice given caffeine not coffee
or 6 cups (equivalence) is more than 1 dose
- (and) the effect on mice might not be same as on humans
allow only tested on mice
- (also) text suggests that the treatment improves memory loss (rather than delays it)

accept text suggests disease cured

or mice already have memory loss or experiment only showed improvement in memory

or does not show **delays** Alzheimer's

or experiment not done on old mice

allow reference to the fact that mice engineered to have it

3

[6]