

GCSE

BIOLOGY

AQA - COMBINED SCIENCE

MARK SCHEME

B3

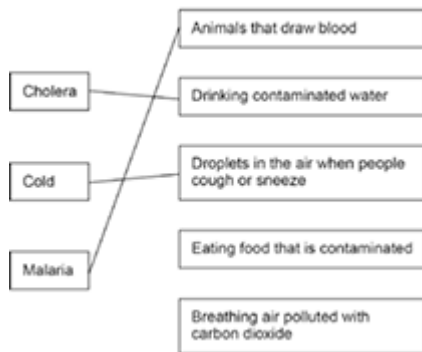
INFECTION & RESPONSE

TEST 3

Mark schemes

1

(a) **Disease** **Way the disease is spread**



extra lines from left cancel the mark

3

(b) any **two** from:

- skin acts as a barrier
- blood clots (over cuts)
- nose (hairs) catch particles (breathed in)
- mucus (in trachea / bronchi) traps microorganisms
- acid in stomach kills microorganisms

2

(c) because measles is a virus

1

(d) 28 / twenty eight

± 0.5 small square tolerance

1

(e) 2.5

1

(f) number will decrease

1

less likely to come into contact with someone with measles / the disease

1

[10]

2

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

- (produce) toxins / poisons
- (cause) damage to cells
kill / destroy cells
allow kills white blood cells

1

(ii) produce antitoxins

1

engulf / ingest / digest pathogens / viruses / bacteria / microorganisms

accept phagocytosis or description

ignore eat / consume / absorb for engulf

ignore references to memory cells

1

(b) (i) dead / inactive / weakened

accept idea of antigen / protein

1

(measles) pathogen / virus

ignore bacteria

1

(ii) (after infection)

accept converse if clearly referring to before vaccination

1

rise begins sooner / less lag time

steeper / faster rise (in number)

1

longer lasting **or** doesn't drop so quickly

idea of staying high for longer

ignore reference to higher starting point

1

(iii) antibodies are specific or needs different antibodies

*accept antigens are different **or** white blood cells do not recognise virus*

1

(c) reduces spread of infection / less likely to get an epidemic

accept idea of eradicating measles

1

[10]

3

(a) antigen (in vaccine) stimulates white blood cells

allow leucocytes / lymphocytes

*do **not** accept phagocytes*

1

to produce specific antibodies

1

(so) if the person ingests salmonella

allow idea of secondary exposure

1

(so on secondary exposure to antigen / bacteria white blood cells) produce the (correct) antibodies faster or in larger quantities

allow idea of memory cells produced

1

(so) toxins (produced by the bacteria) don't reach high enough concentrations / levels (to make the person have symptoms)

1

(b) (random) mutations (in the population of bacteria)

*do **not** accept bacteria deliberately mutate*

1

(so that) resistant salmonella / bacteria are not killed by the antibiotic / nalidixic acid

allow those bacteria without the mutation are killed by antibiotic / nalidixic acid

*do **not** accept immune bacteria*

1

(so) these bacteria reproduce to pass on the gene for resistance (to their offspring)

1

[8]

4

(a) any **one** from:

- not all deaths recorded
- not all causes of deaths recorded

allow cause may not be known

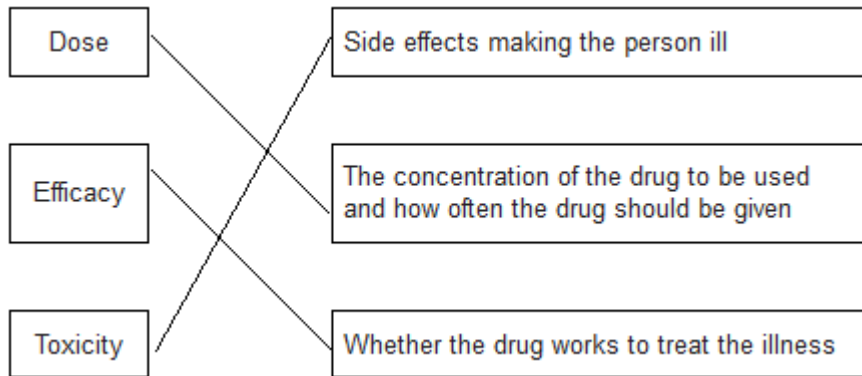
1

(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

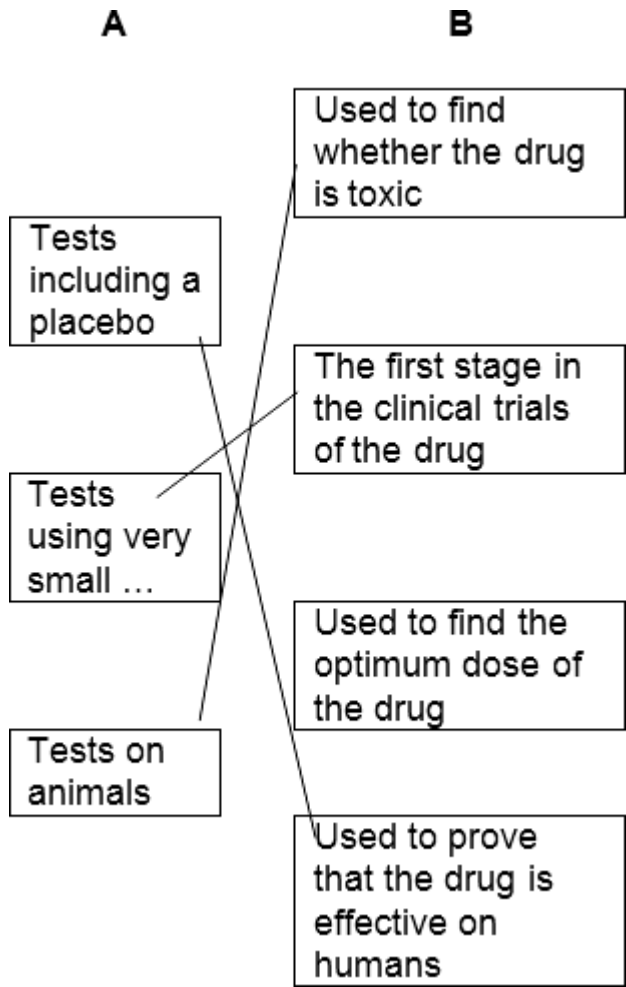
(d) any **one** from:

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

1

[5]

5 (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

(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]

6

(a) (i) viruses live inside cells

1

viruses inaccessible to antibiotic

allow drug / antibiotic (if used)

would (have to) kill cell

1

(ii) any **two** from eg

- non-resistant strains killed (by antibiotics)
- so less competition
- overuse of antibiotics / antibiotics prescribed for mild infections
if no marks gained allow one mark for 'people do not finish course of antibiotics'

2

(b) (stimulate) antibody production

ignore antitoxin

1

(by) white cells

1

rapidly produce antibody on re-infection
ignore antibodies remain in blood

1

[7]

7

- (a) dead or inactive or weak form of pathogen / bacterium / virus / microorganism introduced
ignore disease / germ

1

(stimulates) white cells / lymphocytes / leucocytes
accept B and T cells
ignore phagocytes

1

to produce antibodies
ignore antitoxins / antigens

1

antibodies made quickly on re-infection / idea of memory cells
ignore already has antibodies
ignore 'body remembers'

1

- (b) (i) alters / causes chemical processes / body chemistry
ignore craving / withdrawal symptoms

1

(ii) any **two** from:

- combined molecule / vaccine stimulates antibody production
- if nicotine taken, antibodies bind to nicotine molecules
ignore destroys nicotine
- making them too large to get to brain / making them ineffective
allow prevents nicotine entering brain

2

[7]

8

- (a) (i) any **one** from:
- cells
 - tissues
 - (live) animals / named
allow mammals

1

(ii) any **three** from:

(to test for)

- toxicity / check not poisonous / not harmful
allow side-effect
allow converse
- interaction with other drugs
- efficacy **or** to see if they work **or** check if they treat the disease
allow converse
- dosage **or** how much is needed

3

(b) **argued evaluation**

*comparison can be written anywhere in evaluation allow use of 'only' for implied comparison for each point eg **only** statins damage muscles / kidneys / organs*

any **six** from:

- statin can damage / muscles / kidneys / organs but cholesterol blockers don't
ignore liver
if neither of the first 2 points are given accept for 1 mark
- statins can cause death but cholesterol blockers don't
*statins are more dangerous than cholesterol blockers **or** statins have more side effects*
- cholesterol blockers can interfere with action of other drugs but statins don't
- statins are for a life time but cholesterol blockers are not
- statins (might) reduce cholesterol to zero but cholesterol blockers only reduce it **or** statins reduce cholesterol more
allow statins (might) stop membrane / hormone production but cholesterol blockers don't
- statins better for people with inherited high cholesterol
- cholesterol blockers better for people with dietary cholesterol problems
- taking/using statins/cholesterol blockers is better than dying from heart attack or build up of fat in blood vessels or reduced blood flow

6

[10]