

MARK SCHEME

GCSE

BIOLOGY

AQA - TRIPLE SCIENCE

B 3 - TEST 6

INFECTION

Advanced

Mark schemes

1.	(a) (i)	antibiotic or named antibiotic <i>ignore antibodies</i> <i>accept antiseptic</i> <i>do not accept disinfectant</i>	1	
	(ii)	painkillers <i>accept named painkillers eg aspirin</i>	1	
	(b) (i)	5.5 / 5 ½ weeks	1	
	(ii)	rose gains 1 mark rose, then fell then rose again gains 2 marks a further 1 mark for one quantitative statement eg <ul style="list-style-type: none">• rose for 3 weeks / to 14–15 units• dropped to 4 weeks / 9 units• rose to 7 weeks / 64–65 units	3	
	(iii) (no)	level begins to fall / is falling (after 7 weeks)	1	[7]
2.	(a) (i)	viruses live inside cells viruses inaccessible to antibiotic <i>allow drug / antibiotic (if used)</i> <i>would (have to) kill cell</i>	1	
	(ii)	any two from eg <ul style="list-style-type: none">• non-resistant strains killed (by antibiotics)• so less competition• overuse of antibiotics / antibiotics prescribed for mild infections <i>if no marks gained allow one mark for 'people do not finish course of antibiotics'</i>	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]**

- 3.** (a) compare them to (pictures in) a gardening manual / website 1
- send to laboratory (for testing) 1
- (b) (nitrate) stunted growth 1
- (magnesium) yellowing of leaves
allow chlorosis 1
- (c) (fertiliser **S**)
- has most nitrogen for good growth
*if no other marks awarded allow 1 mark for (fertiliser **s**) has more minerals than compost* 1
- (and) has high(est) potassium content for stronger roots 1
- (it is also) cheaper than fertiliser **T** 1
- (however) has less phosphate than fertiliser **T** (although more than compost) so flowers / fruit perhaps less important for the gardener 1
- [8]**

- 4.** (a) white cells ingest bacteria
produce antibodies which destroy bacteria
produce antitoxins which counteract poisons produced by bacteria
for 1 mark each 3
- (b) dead/mild microbes
stimulate antibody production
white cells can quickly produce these again
for 1 mark each 3

- (c) adds more bacteria (mild)
does not affect TB bacteria
for 1 mark each

2

[8]

5.

- (a) A

1

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

- identify / locate specific molecules / other hormones
- locate blood clots
- diagnose / treat some cancers

1

- (c) (as) urine passes through reaction zone

1

HCG hormone binds to the mobile HCG antibody (in the reaction zone)

1

(passes up the stick) HCG hormone binds to the immobilised HCG antibodies in the results zone

1

(the other) antibodies which do not attach to HCG

1

bind to antibodies in control zone

1

blue dye appears in both control and results zones (to show positive result)

1

[8]

6.

- (a) (i) white blood cells
for 1 mark

1

- (ii) e.g. contact with infected person unhygienic conditions
for 1 mark each

2

- (iii) broken down, by enzymes into amino acids
any 2 for 1 mark each

2

- (b) reproduce rapidly produce toxins
for 1 mark each

2

- (c) antibiotic or named
for 1 mark

1

- (d) mild or deal microbes introduced white cells produce antibodies
 which can destroy disease microbes
 idea of memory cells
 idea that injecting antibodies give immediate production
any 3 for 1 mark each

3

[11]

7.

- (a) (i) dead / inactive / weakened
allow antigen / protein
ignore ref to other components
ignore small amount

1

pathogen / bacterium / virus / microorganism
ignore germs / disease

1

- (ii) *antigen / antibiotic instead of antibody = max 2*

white blood cells produce / release antibodies
accept lymphocytes / leucocytes / memory cells produce antibodies
*do **not** accept phagocytes*

1

antibodies produced quickly

1

(these) antibodies destroy the pathogen
allow kill
*do **not** accept antibodies engulf pathogens*

1

- (b) (i) (live) bacteria still in body
ignore numbers

1

would reproduce
ignore mutation / growth

1

- (ii) antibiotics / treatment ineffective **or** resistant pathogens survive
accept resistant out compete non-resistant

1

these reproduce

1

population of resistant pathogens increases
allow (resistant pathogens reproduce) rapidly

1

[10]

8.

- (a) (mouthpiece) has pierced / entered the phloem
or
(the aphid) has been feeding from the phloem

1

- (b) yellow leaves due to lack of chlorophyll

ignore 'chloroplasts'

ignore magnesium is needed to make chlorophyll

1

(therefore) less / no light absorbed (by chlorophyll)

1

(therefore) lower rate of / no photosynthesis

do not allow 'energy is produced by photosynthesis'

1

(therefore) plant makes less / no sugar / glucose

1

(therefore) plant converts less / no sugar / glucose into protein (for growth, so growth is stunted)

allow less glucose / sugar converted into cellulose (cell wall)

allow less energy for protein synthesis

1

- (c) inject the protein / it into a mouse

1

combine lymphocytes with tumour / cancer cells to make hybridoma (cells)

ignore white blood cells

allow T or B lymphocytes

ignore tumour unqualified

1

find a hybridoma which makes a monoclonal antibody specific to PVY

1

(the scientist) clones (the hybridoma) to produce many cells (to make the antibody)

do not allow cloning of original stem cells

allow many rounds of cloning / mitosis

1

[10]