

Boost your performance and confidence with these topic-based exam questions

Practice questions created by actual examiners and assessment experts

Detailed mark scheme

Suitable for all boards

Designed to test your ability and thoroughly prepare you

Time allowed **50 Minutes**

2002

Score /40

Percentage

%

Biology

Mark Scheme

AQA AS & A LEVEL 3.2 Cells

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1 (a) 1. Antibody has tertiary structure;

- 2. Complementary to binding site on protein.
- (b) 1. Prevents false negative results;
 - 2. (Since) shows antibody **A** has moved up strip / has not bound to any *Plasmodium* protein.

2

2

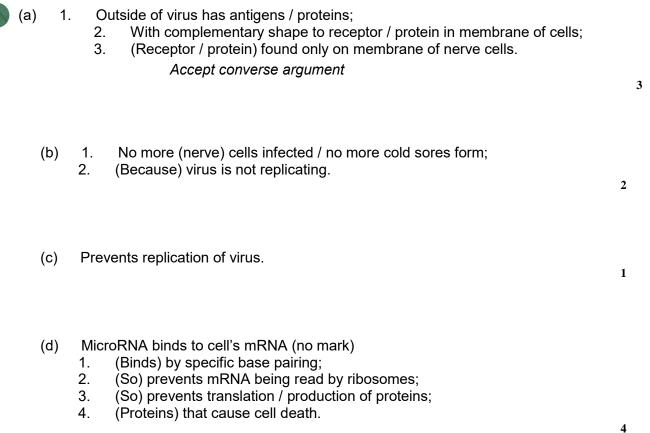
- (c) 1. Person is infected with *Plasmodium* / has malaria;
 - 2. Infected with (*Plasmodium*) vivax;
 - 3. Coloured dye where antibody **C** present;
 - 4. That only binds to protein from *vivax* / no reaction with antibody for *falciparum*.

Person is infected with P. vivax / Plasmodium vivax = 2 marks (MP1 and MP2)

[8]

4









(i)

(Tumour suppressor) gene inactivated / not able to control / slow down cell division;

Ignore: references to growth

Rate of cell division too fast / out of control.
 1 and 2 Accept: mitosis
 1 and 2 Reject: meiosis

2

- (ii) 1. (Genetic) code degenerate; Accept: codon for triplet Accept description of degenerate code, e.g. another triplet codes for the same amino acid
 - 2. Mutation in intron. Accept: mutation in non-coding DNA

- (b) 1. Antibody has specific tertiary structure / binding site / variable region; Do not accept explanations involving undefined antigen
 - Complementary (shape / fit) to receptor protein / GF / binds to receptor protein / to GF;
 Ignore: same shape as receptor protein / GF
 - 3. Prevents GF binding (to receptor).

3

[6]



4 (a)

Regulator protein.

Accept regulator protein antigen Reject regulator protein receptor Ignore regular protein

(b) 1. Lipid soluble / hydrophobic2. Enters through (phospholipid) bilayer

- OR
- 3. (Protein part of) LDL attaches to receptor
- 4. Goes through carrier / channel protein.
 - 4. Accept by facilitated diffusion or active transport
 - 4. Reject active transport through channel protein

2

1

(c) Any **two** from:

- (Monoclonal antibody) has a specific tertiary structure / variable region / is complementary to regulator protein Do not award MP1 if reference to active site.
- 2. Binds to / forms complex with (regulator protein) *"It" refers to monoclonal antibody in MP1 and MP2*
- 3. (So regulator protein) would not fit / bind to the receptor / is not complementary to receptor
 - 3. Reject receptor on LDL

2 max

- (d) 1. Injection with salt solution 1. Accept inject placebo in salt solution
 - 2. Otherwise treated the same.

2

[7]





Any **two** from:

- 1. (Decrease linked to) few(er) cases of whooping cough;
- 2. (Decrease linked to) risk of / fear of side effects;
- 3. Insufficient vaccine available / too expensive to produce / distribute.
 - 3. Too expensive unqualified is insufficient for mark

2 max

- (b) 1. Vaccination rate increases;
 - 2. Fewer people to spread the disease / whooping cough / more people immune / fewer susceptible.
 - 2. Neutral greater herd effect
 - 2. Allow description of immune
 - Q Reject 'resistant'.

2

(c) 1. More people are immune / fewer people carry the pathogen;
 If neither point 1 or 2 awarded
 Herd immunity = 1 mark

Unvaccinated does not mean infected 1. **Q** Do not accept disease for pathogen

 So susceptible / unvaccinated people less likely to contact infected people.

[6]

2



6 (a)

1. (Releases) toxins;

2. Kills cells / tissues.

2. Accept any reference to cell / tissue damage Ignore infecting / invading cells

(b) 1. Water potential in (bacterial) cells high<u>er</u> (than in honey) / water potential in honey low<u>er</u> (than in bacterial cells);

Q candidates must express themselves clearly

1. Must be comparative e.g. high WP in cell and low WP in honey

- 2. Water leaves bacteria / cells by osmosis;
- 3. (Loss of water) stops (metabolic) reactions.
 - 3. Needs a reason why lack of water kills the cell

3

2