

AQA AS Biology Unit 1 Chapter 3 Bacteria Answers

1.

- (a) cell wall;
capsule; 2
- (b) $130\,000 / 6.5$;
20 000; (*Allow 1 mark for using 6.5 as the denominator*) 2
- (c) membranes (folded to increase the surface area);
(*allow references to phospholipid bilayers – do not award references to cell membranes*)
(sites) for respiration / electron transport chain;
contain electron carriers / cytochromes / enzymes;
(*do not allow references to glycolysis, Krebs cycle*) 2 max

2.

- (i) cytoplasm;
ribosomes;
phospholipid membranes / cell membrane / semipermeable membrane; 2 max
(*accept folded membrane for two marks*)
- (ii) (*it = bacterium*)
cell wall;
capsule;
flagellum;
mesosome;
no nucleus / nuclear membrane / DNA free;
no mitochondria;
(*accept 'no membrane-bound organelles' if neither nucleus nor mitochondria mark scored*)
no microvilli;
no Golgi;
no ER;
70S/smaller ribosomes; 2 max

3.

- (a) (i) D plasmid / ribosome(s) / cytoplasm / storage granules;
(*accept any sensible structure*)

E (slime / mucous) capsule

OR

slime / mucous layer; 2
- (ii) protection / maintain shape / prevent lysis / strength / support; 1
- (b) two of the following:
nucleus;

OR

nuclear envelope / mitochondria / chloroplasts / sER / rER /
golgi apparatus / 80s ribosomes
linear DNA / chromosomes / lysosomes / vacuole / vesicles / cellulose cell wall; 2 max

4.

- (a) (i) Ribosomes;
Cytoplasm;
DNA; 1 max
- (ii) Any three suitable answers
- For example,
- No nuclear envelope/nucleus;
No mitochondria;
No chloroplasts;
No vacuole;
Mesosomes present / folded cell (surface) membrane;
Plasmids/loops of DNA / non-linear DNA;
Capsule not in plant cells;
Different composition of cell wall;
DNA does not associate with proteins/form chromosome;
No Golgi;
No SER/RER;
Smaller/70S ribosomes; 3 max
(allow one mark for "no membrane-bound organelles" if no named organelle in answer)

5.

- (a) Two of A, C, D; 1
- (b) Structure, capsule/cell wall; 1
- (Cell wall/capsule) have polysaccharide/ sugar/ protein/ ligands;
That bind to host cells;
- OR
- (Cell wall/capsule of Gram negative) breaks down when bacterium dies;
releasing endotoxin;
- OR
- Capsule has fewer binding sites/receptor sites/antigens;
Less antibodies can bind/phagocytosis;
- OR
- Capsule resistant to enzymes;
Protects from/reduces phagocytosis; 2 max

6.

(a)		A = capsule / slime/mucus (layer);	1
		B = flagellum;	1
(b)		Ribosome;	1

7.

- (b) (i) movement (to find wood particles) / creates current to draw wood particles to cell / produces feeding current ; (attachment neutral) 1
- (ii) similarities
 both have membranes;
 both have ribosomes;
 differences – *Trichonympha* / *it* (allow *prokaryotic cell* has not)
 has nucleus;
 has mitochondria;
 has ER;
 has Golgi;
 ELSE accept 'no membrane-bound organelles' if no membranous organelle given;
 has linear chromosome / linear DNA;
 has no cell wall;
 has no mesosome;
 has flagella with different structure;
 has ribosome with different size; max 4 differences 5

8.

- (a) cell wall;
 capsule; 2
- (b) 130 000 / 6.5;
 20 000; (Allow 1 mark for using 6.5 as the denominator) 2
- (c) membranes (folded to increase the surface area);
 (allow references to phospholipid bilayers – do not award references to cell membranes)
 (sites) for respiration / electron transport chain;
 contain electron carriers / cytochromes / enzymes;
 (do not allow references to glycolysis, Krebs cycle) 2 max

9.

plasmid;
 capsule; 2

10.

similarity
 both have large SA / show folding / have phospholipid membrane /
 have proteins / enzymes associated with aerobic respiration; 1

difference
 mitochondrion completely enclosed in membrane / mitochondrion has
 DNA / mitochondrion has ribosomes / mesosome infolding of
 surface membrane; 1

11.

- (a) (i) protection against chemicals/desiccation/phagocytic cells/antibiotic/
 viruses/antibodies /increase virulence/ to stick together in colonies; 1
- (ii) site of respiration / may be involved in cell division/DNA replication /
 uptake of materials / production of ATP / site of electron transfer chain; 1
- (b) differential centrifugation/centrifuge in stages/at different speeds; 1
 until have pellet containing ribosomes / ribosomes separate last; 1

12.

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|-----|------|---|---|
| (a) | (i) | no cell wall / only has (plasma) membrane; | 1 |
| | (ii) | has capsule / slime layer; | 1 |
| (b) | | correct approach which makes use of scalebar;
<i>ignore</i> reference to units. | 1 |
| (c) | | cellulose / starch / amylose / amylopectin; | 1 |
| (d) | (i) | <u>water potential</u> lower/more negative in cell;
(water enters by) <u>osmosis</u> ; | 2 |
| | (ii) | plant cell wall made of a different substance/cellulose / penicillin does not affect cellulose; | 1 |

13.

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|-----|---|---|
| (a) | Plant cell | Prokaryotic cell |
| | Cellulose cell wall; mitochondria;
nucleus; chloroplast; Golgi or other
organelle;
Absence of flagellum; capsule;
mesosome;
Membrane-bound organelles; | Absence of cellulose cell wall;
mitochondria; nucleus; chloroplast;
Golgi or other organelle;
Flagellum; capsule; mesosome;
No membrane-bound organelles; |

Allow any pair of entries relating to structural feature. Must compare like with like. 2

14.

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|------|--|---|
| (i) | Water potential is lower / more negative;
Water enters the cell by osmosis / diffusion; | 2 |
| (ii) | Plant cell wall and bacterial cell wall made of different
substances;
<i>Ignore incorrect references to substances in the bacterial wall</i> | 1 |