

Multiple Choice Answers

Q5: D
Q36: A
Q38: C

Multiple Choice Answers

Q38: B

Multiple Choice Answers

Q37: C

6(a)(i)	gene ;
6(a)(ii)	transcribed / template, strand ;
6(a)(iii)	ribosome ; I 70S / 80S
6(a)(iv)	weakens / AW, bacterial <u>cell wall</u> ; cell cannot maintain turgor / AW ; leads to (osmotic) lysis / AW ;
6(b)(i)	flattened cells / AW ; short diffusion distance, (for gas exchange / described) ;
6(b)(ii)	stretch / expand, on inhalation, to prevent alveoli bursting / rupturing / overstretching ; recoil on exhalation to help expel air from the lungs ; <i>if no marks gained, allow one mark for stretch and recoil</i>

4(a)	<i>any three from:</i> <i>max 2 for similarities, max 2 for differences</i> <i>similarities, both have</i> phospholipids ; channel / transport, protein ; A intrinsic / integral / transmembrane, protein R carrier / pump, protein a bilayer / two layers ; <i>differences</i> <i>do not need to have 'outer membrane' 'bacterial' if context is clear</i> (bacterial outer membrane) has lipopolysaccharides ; ora (cell surface membrane / eukaryote) has, phospholipid bilayer / both layers with phospholipids ; ora <i>if ora also given (bacterial) only has outer layer of (outer) membrane with phospholipids, can also award mp1</i> AVP ;; e.g. cell surface membrane has, glycocalyx / glycolipids / glycoproteins cell surface membrane has cholesterol outer membrane does not have extrinsic proteins
4(b)(i)	<i>any one from:</i> <i>formation of O-IMV</i> involves a more complex process ; e.g. greater variety of, contents / cell structures R organelles <i>ref. to</i> needing to make a vesicle with two 'membranes' / AW A 'layers' peptidoglycan, chains / layer / bonds, need to be broken ; A peptidoglycan wall needs to be broken causes, (temporary) weakness in cell wall / risk of lysis ; <i>idea that</i> more resources required to form vesicle or too great a loss of important cell, components / structures <i>ref. to</i> take more time to produce ; uses (more) energy to, break wall / repair wall / make the vesicle ; I ref. to organelles AVP ; e.g. suggestion that periplasmic proteins need to be released in greater numbers so more OMVs formed
4(b)(ii)	<i>any one suggestion that:</i> <i>must be in context of a fully formed O-IMV</i> function of O-IMVs require, energy / ATP ; A suggested function e.g. DNA transcription / metabolic reactions / for active transport I cell processes O-IMV (formation) has cytoplasm, which contains ATP ; OMVs formed only from periplasm, which has no ATP ; A no ATP in outer membrane space AVP ; e.g. no / few, ATP transporters / transport proteins, for exit of ATP into periplasm (in area where OMV forms)
4(b)(iii)	<i>ref. to</i> DNA in O-IMVs being passed on to other bacteria ; e.g. O-IMVs may, fuse with / be taken up by / AW, plasmids / DNA, in (degraded) O-IMVs may enter other bacteria qualified <i>ref. to</i> O-IMV DNA and antibiotic resistance ; e.g. O-IMVs have, alleles / genes / plasmid, that, give / confer / AW, antibiotic resistance DNA may mutate to give (a, gene / allele, for) antibiotic resistance DNA, codes for / expresses / AW, a protein involved in antibiotic resistance example of gene conferring resistance e.g. enzyme to breakdown antibiotic change to ribosome structure (to prevent antibiotic attachment) efflux pump for / membrane protein to pump out, antibiotic

2(a)	any two from: 1 (initial) volume / population / number, of bacteria (in bacterial suspensions) or volume of (bacterial) suspension or (original) optical density of (bacterial) suspensions ; 2 volume of nitrite (ion solution) ; 3 concentration / volume, of nutrient broth ;
2(b)(i)	(<i>species of bacterium</i>.) nominal ; (<i>lowest nitrite concentration</i>.) continuous ;
2(b)(ii)	1 correct reading of values from Figure 2.1 (<i>Salmonella enteritidis</i> =) 0.7 <u>and</u> (<i>Salmonella typhimurium</i> =) 5 ; 2 correct working ; 3 correct value for percentage difference ; 614 (%) / 86 (%)
2(b)(iii)	(most affected =) <i>Yersinia enterocolitica</i> (least affected =) <i>Salmonella typhimurium</i> ;
2(c)	any four from: 1 <i>idea that</i> investigation, not carried out in a person / carried out in a laboratory ; 2 <i>idea that</i> investigation only carried out for 24 hours / no information about longer term effects ; 3 <i>idea that</i> experiment, only used 5 species of (pathogenic) bacteria / did not use other bacteria ; 4 pH in the, digestive system / stomach / intestines / AW, is not 4.8 / is different ; 5 <i>idea that</i> nitrites may, kill / reduce growth / AW, of / beneficial / AW, bacteria (in the digestive system) ; 6 nitrites could, cause side effects / be toxic / AW (in humans) ; 7 no evidence of control experiment ; 8 no statistical, test / analysis ; 9 <i>idea that</i> (bacterial) population sizes may not have decreased (as only measured when no bacterial population growth occurred) ;