

Multiple Choice Answers

Q5: D
Q36: A
Q37: C

Multiple Choice Answers

Q38: C

Multiple Choice Answers

Q36: B
Q37: A

Multiple Choice Answers

Q36: C

2(a)	<i>Vibrio cholerae</i> ; must be spelled correctly
2(b)	any four from: within general response, in correct context 1 ref. to, <u>contamination</u> / <u>contaminated</u> ; A presence of, pathogen / <i>V. cholerae</i> / bacterium in correct context (can look for ora) 2 ref. to breaking the <u>transmission cycle</u> ; providing access to safe drinking water 3 cholera is transmitted by <u>faecal-oral</u> route ; A described e.g. ref. to (contaminated) faeces <u>and</u> ref. to, food washed in contaminated water or drinking (contaminated) water or eating (contaminated) food practise personal hygiene 4 ref. to using method to make sure faeces do not enter drinking water ; e.g. use of, toilets / latrines A do not defaecate in or near, rivers / reservoirs / lakes AW accept urinate I non-scientific terms for, defaecation / urination 5 washing hands ; 6 detail ; e.g. use, soap / antibacterial gel / AW after, urination / defaecation A after going to the toilet before handling foods <i>context is preparation or eating a meal</i> scrub under fingernails cafes, restaurants / AW, provide places for washing hands do not share towels / use disposable towels / AW 7 AVP ; e.g. water, is / should be, chlorinated / boiled / bottled / filtered to remove pathogens / UV-treated / other water, is / should be, kept separate from sewage / piped direct from water treatment plant keep fingernails short safe disposal of vomit

2(c)(i)	antigen is a standalone mark then move to rows 3,4,5 if no marks gained from rows 3,4,5, check for correct answers in these rows going <u>down</u> the column to award 1 mark <table border="1"> <thead> <tr> <th>row</th><th>feature</th><th>oral cholera vaccine</th><th>passive immunisation for cholera</th></tr> </thead> <tbody> <tr> <td>1</td><td>component causing the desired response</td><td>antigen(s) ; I weak / weakened / toxin A toxoid / inactivated toxin R dead antigen A weakened / attenuated / dead, pathogen / <i>V. cholerae</i></td><td>antibody</td></tr> <tr> <td>2</td><td>type of immunity gained</td><td>artificial active</td><td>artificial passive</td></tr> <tr> <td>3</td><td>stimulates production of memory lymphocytes</td><td>(yes) / no</td><td>yes (no) ;</td></tr> <tr> <td>4</td><td>length of time needed to have an effect</td><td>shorter same (longer)</td><td>longer same (shorter) ;</td></tr> <tr> <td>5</td><td>duration of immunity</td><td>shorter same (longer)</td><td>longer same (shorter) ;</td></tr> </tbody> </table>			row	feature	oral cholera vaccine	passive immunisation for cholera	1	component causing the desired response	antigen(s) ; I weak / weakened / toxin A toxoid / inactivated toxin R dead antigen A weakened / attenuated / dead, pathogen / <i>V. cholerae</i>	antibody	2	type of immunity gained	artificial active	artificial passive	3	stimulates production of memory lymphocytes	(yes) / no	yes (no) ;	4	length of time needed to have an effect	shorter same (longer)	longer same (shorter) ;	5	duration of immunity	shorter same (longer)	longer same (shorter) ;
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2(c)(ii)	B-lymphocyte / plasma cell / splenocyte, <u>and</u>, myeloma / tumour, cell ; A B-cell for B-lymphocyte A cancer cell for myeloma cell plus two from: (B-lymphocyte) synthesises (specific / desired) / AW, antibody ; I has the antibody (B-lymphocyte) cannot survive (for long) / dies, in culture ; (myeloma cell) can divide / can carry out mitosis / long-lived ; I rapidly / fast A plasma cell cannot divide R (hybridoma cell) divides uncontrollably
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2(a)	cholera = prokaryotic <u>and</u> malaria = eukaryotic <u>and</u> TB = prokaryotic ;
2(b)	pathogen ;

2(c)(i)	magnification (x) 12 000 ;; for line X-Y measuring 24 mm A calculated values for line X-Y measured between 23 to 25 mm for one mark: - correct calculation for 23.5 or 24.5 but not to 3 sig. figs = 1 mark - incorrect answer e.g. conversion factor incorrect, but - shows correct measurement for image - uses correct formula for calculation - answer to 3 sig. figs - measurement 22 mm or 26 mm - correct answer for their measurement - uses correct formula for calculation - answer to 3 sig. figs
2(c)(ii)	any three from: 1 by a vector / carrier / mosquito / insect / (female) <i>Anopheles</i> ; 2 takes, blood meal / sucks blood / feeds on blood ; context is transmission from infected to uninfected 3 <i>Plasmodium</i> / pathogen / parasite, is in blood ; in correct context 4 injects <i>Plasmodium</i> / AW, together with, anticoagulant / saliva ; 5 AVP ; e.g. <i>Plasmodium</i> / AW, migrates, after ingestion / from insect gut / AW, to salivary glands if another mode of transmission stated, e.g. transfusion, allow mp1 and mp3 and a relevant AVP

2(d)(i)	any two from: (phagocyte) has (specific) <u>receptors</u> (for PS) ; R antigens A named e.g. macrophage / monocyte / Kupffer cell / neutrophil PS binds to (phagocyte / cell surface) receptor (to stimulates a response) ; A phagocyte has a binding site for PS / PS binds to a binding site ref. to (PS presence / change in membrane) causes chemotaxis / attracts phagocyte (to red blood cell) treat as neutral suggested chemicals that trigger chemotaxis AVP ; e.g. PS acts as an antigen
2(d)(ii)	any one from: why uninfected red blood cells are destroyed (some) PS is present in outer layer so can be, recognised / detected ; AW why only some red blood cells are destroyed only a few PS in outer layer so lower chance of being recognised ; parts of, parasite / pathogen / <i>Plasmodium</i> (in circulation), may become attached to, surface / cell surface membrane ; (cell) displays, a foreign antigen / a non-self, antigen ; displays an antibody (attached to antigen) ; damaged (by other means) / at end of life-span / non-functioning, (so need destroying) ;
2(e)(i)	R if context is, red blood cell / entry into red blood cell by pathogen any one from: context is <i>Plasmodium</i> for, cell membrane(s) / cell surface membrane ; maintain / regulate, stability / fluidity, of membrane ; I affects / changes, if not qualified A phospholipid bilayer for membrane to, convert / AW, to other products needed ; to (breakdown and) use as an energy source ; cannot / does not have gene to, synthesise cholesterol ; AVP ; e.g. to form, vesicle / vacuole (to contain replicated cells)

2(e)(ii)	I ref. to temperature any two from: 1 make more fluid / increase fluidity ; 2 decrease / reduces, membrane stability ; 3 increases, entry / exit, of, polar molecules / ions / water ; A increases, permeability / described 4 allow increased (lateral) movement of cell components within bilayer ; 5 reduced interaction with fatty acid tails ; 6 AVP ; e.g. decreased interaction with proteins, so affecting their function may affect ability to distort shape when passing through capillaries if no marks gained, allow one compensation mark for - changes two of: fluidity / stability / permeability - ecf from 'decreases fluidity'
2(f)(i)	any one from: active / energy-requiring, process ; A need energy, for the process / to move phospholipids moving, phospholipids / named, against the concentration gradient / to area with higher quantity / AW ; to allow conformational change (of enzyme) ; I active transport but R if described as movement across the membrane
2(f)(ii)	any one from: actively transport / pump, Ca^{2+} / calcium ions, out of cell (once entered) ; transports Ca^{2+} / calcium ions, (out) against the concentration gradient ; cell surface membrane impermeable to, Ca^{2+} / calcium ions ; no / very few, transport / pump / carrier / channel, (membrane) proteins ; context is for entry of calcium ions

2(f)(iii)	any three from: 1 scramblase, activated / becomes active / begins functioning / AW ; context is, increase in Ca^{2+} / when Ca^{2+} binds A Ca^{2+} increases, more scramblase binds to Ca^{2+} ora scramblase, suppressed / inactive (only), in low Ca^{2+} concentration 2 scramblase moves, PC from outer to inner layer or PE / PS, from inner to outer layer ; I scramblase randomly moves, PC / PE / PS 3 described effect on, distribution / organisation / asymmetry / AW (of phospholipids in cell surface membrane) ; e.g. becomes, disrupted / disorganised / more random is uncontrolled / not regulated becomes more, symmetrical / even / evenly balanced higher proportion of, PC in inner layer higher proportion of, PE / PS, in outer layer (than normal) (idea that the phospholipids are in the incorrect location) 4 scramblase activity higher than activity of, flippase / floppase or idea that, flippase / floppase, action cannot counteract effect of scramblase ; 5 ATP runs out, qualified ; e.g. to maintain asymmetry for (increased), flippase / floppase, activity to move phospholipids (against their gradient) 6 AVP ; e.g. Ca^{2+} is, a cofactor / needed for scramblase function
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