链滴

p2 questions

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来源网站：链滴

chapter 1 cell structure

- M18-22 p2-2018.pdf - p2 - 1abc
  - p2-2018.pdf - p2 - (a) scan vs transmission microscope #al1/1 microscopy#
  - p2-2018.pdf - p2 - b. structural feature between golgi body vs ER #al1/2 organelles#
  - p2-2018.pdf - p2 - c. calculation #al1/1 microscopy#
  - d. p2-2018.pdf - p3 - i. the fluid mosaic model #al4/1.1 membrane structure#
  - d. p2-2018.pdf - p3 - ii. the membrane permeability #al4/1.1 membrane structure#
- S18-22 p2-2018.pdf - p34 - 1
  - p2-2018.pdf - p34 - a. identify organelles #al1/2 organelles#
  - p2-2018.pdf - p34 - b. magnification calculation #al1/1 microscopy#
  - p2-2018.pdf - p34 - c. what organelles can seen in electron but not light microscope #al/1 microscopy# #al1/2 organelles#
    - 基本除了 nucleus, chloroplast, tonoplast, mitochondrion, vacuole 以外

rough endoplasmic reticulum ;	**A** rough ER / RER
smooth endoplasmic reticulum ;	**A** smooth ER / SER
endoplasmic reticulum ;	*acceptable only if the other structure is not SER / RER*
80S / larger, ribosomes ;	**A** 25–30 nm range
plasmodesma(ta) ;	
microtubules ;	**A** microfilaments
	A cytoskeleton
lysosome(s) ;	
Golgi (body / apparatus / complex) ;	
secretory / Golgi, vesicles ;	
AVP ; ; e.g. chromatin	
EM detail of chloroplast	
EM detail of mitochondrion	**A** mitochondrion
nuclear pore	
nuclear envelope	**R** nuclear membrane

- S18-23 p2-2018.pdf - p51 - 2
  - p2-2018.pdf - p51 - a. naked eyes vs light microscope #al1/1 microscopy#
  - p2-2018.pdf - p51 - b. explain ER can not be observed by light microscope #al1/1 microscopy# #al1/2 organelles#
- S18-23 6 p2-2018.pdf - p65 - (b)
  - p2-2018.pdf - p65 - (b) pro vs euk #al1/2.6 pro vs euk#
- W18-22 4 p2-2018.pdf - p92 - (a)
  - p2-2018.pdf - p92 - (a) structure features of viruses --- w18-23 的题可以替代 #al1/2.7 virs#

- W18-23 p2-2018.pdf - p102 - 1
  - p2-2018.pdf - p102 - a. golgi body role #al1/2 organelles#
  - b. p2-2018.pdf - p103 - i. mit role #al1/2 organelles#
  - b. p2-2018.pdf - p103 - ii. mitoch has DNA inside #al1/2 organelles#
  - c. p2-2018.pdf - p103 - i. virus structure features #al1/2.7 virus#
  - c. p2-2018.pdf - p103 - ii. (viruses) pass through **plasmodesmata **between plant cel s #al1/2 organelles#
- S19-21 1 p2-2019.pdf - p19 - b.
  - p2-2019.pdf - p19 - b. recognize the organelles and state the function. #al1/2 organelles#
- S19-23 3a
  - p2-2019.pdf - p56 - a. pro vs euk #al1/2.6 pro vs euk#
- w19-22 p2-2019.pdf - p86 - 3
  - p2-2019.pdf - p86 - a. the advantage of using electron microscope #al1/1 microscopy#

any two from:

1 higher / better, resolution
A higher resolving power
I clearer resolution
or
greater ability to distinguish between two points / AW ;

*ignore wavelength values if stated as wavelength but **R** if stated as resolution values*

2 *ref. to* resolution values ;
e.g. able to see points closer together than 200 nm (range 100–300 nm)
can see, points up to 0.5 nm (0.0005 µm) apart (range 0.2–1.0 nm)
can see structures larger than 0.5 nm

3 thinner sections can be obtained ;
A idea that complete image will be in better focus

4 able to see, ribosomes / membranes / detail within organelles ;

  - p2-2019.pdf - p87 - b. red blood cells #al1/2 organelles#
  - p2-2019.pdf - p87 - c. the organelles involved in protein synthesis #al1/2 organelles#
- S20-22 p2-2020.pdf - p34 - 1
  - p2-2020.pdf - p35 - b. whether a **virus **can be seen using the light **microscope // th resolution of light microscope is 200 nm **#al1/1 microscopy#

no, because
resolution of light microscope, too low / not high enough ;
only able to distinguish points 200nm or more apart
or
size of virus / 30 nm, too small for resolution of (light microscope) of 200 nm ; **A** range 100-300 nr
wavelength of light too long ;
idea that virus too small to interfere with light waves ;

- S20-23 p2-2020.pdf - p56 - 4 ac
  - p2-2020.pdf - p56 - a. magnification calculation #al1/1 microscopy#
  - p2-2020.pdf - p57 - c. the role of hydrolases in lysosomes #al1/2 organelles#
- w20-22 4 p2-2020.pdf - p90 - a
  - p2-2020.pdf - p90 - i. structure of nucleus and electron microscope #al1/1 microscopy# al1/2 organelles#
  - p2-2020.pdf - p90 - ii. ER vs light microscope #al1/1 microscopy# #al1/2 organelles#
- S21-22 p2-2021.pdf - p43 - 5 a,b
  - p2-2021.pdf - p43 - a. recognize structure in microscopy diagram and give function #al1 2 organelles#
  - p2-2021.pdf - p43 - b. function of golgi body and ribosomes #al1/2 organelles#
- S21-23 p2-2021.pdf - p50 - 1a
  - p2-2021.pdf - p50 - a. the structure and function of SER and rER #al1/2 organelles#
- w21-22 p2-2021.pdf - p82 - 1a
  - p2-2021.pdf - p82 - a. compare bacterial cell vs plant cell #al1/2.6 pro vs euk#
- W21-23 6 p2-2021.pdf - p111 - (b),
  - p2-2021.pdf - p111 - (b). how the structure of a nucleus is suited to its function of conta ning DNA #al1/1 microscopy#

chapter 2 biological molecules

- W18-23 p2-2018.pdf - p104 - 2 ***
  - a. p2-2018.pdf - p104 - i. condensation reaction of polypeptide #al2/3.1 amino acid#
  - a. p2-2018.pdf - p104 - ii. R group #al2/3.1 amino acid#
  - p2-2018.pdf - p105 - b. amylose vs cellulose, structure #al2/2.7 starch glycogen and cellu ose#
  - p2-2018.pdf - p105 - c. cellulose for cell wall #al2/2.7 starch glycogen and cellulose#
- M18-22 3 p2-2018.pdf - p8 - a
  - p2-2018.pdf - p8 - a. describe the hydrolysis reaction of lactose #al2/2.5 glycosidic bond#
- W18-22 p2-2018.pdf - p98 - 5

- polymer and macromolecule #al2/2.2 monomer and polymer#
  - test reducing sugar #al2/1.testing for biological molecules#
- M19-22 p2-2019.pdf - p5 - c
  - p2-2019.pdf - p5 - c. the structure level of protein #al2/3.2 protein structure levels#
- S19-21 1 p2-2019.pdf - p18 - a ***
  - p2-2019.pdf - p18 - a. the structure level of protein #al2/3.2 protein structure levels#
- S19-21 p2-2019.pdf - p22 - 2ab **
  - p2-2019.pdf - p22 - a. fatty acid saturation and the fluidity #al2/2.9 lipids#
  - b. p2-2019.pdf - p23 - i. triglycerides and phospholipids are not polymers #al2/2.9 lipi s#
  - b. p2-2019.pdf - p23 - ii structural differences between phospholipids and triglycerides #al2/2.9 lipids#
- S19-22 5 p2-2019.pdf - p44 - a
  - p2-2019.pdf - p44 - a. identify the monomers and polymers #al2/2.2 monomer and pol mer#
- w19-22 p2-2019.pdf - p89 - 4ab
  - p2-2019.pdf - p89 - a. polymer, monomer and chemical bonds #al2/2.2 monomer and p lymer#
  - p2-2019.pdf - p89 - b. ** structural differences between amylose and cellulose #al2/2.7 s arch glycogen and cellulose#
- w19-23 p2-2019.pdf - p98 - 1abcd ***
  - p2-2019.pdf - p98 - a. haemoglobin structure and function #al2/3.4 globular protein#
  - p2-2019.pdf - p98 - b. globular protein #al2/3.4 globular protein#
  - p2-2019.pdf - p99 - c. polypeptide, polymer #al2/2.2 monomer and polymer#
  - p2-2019.pdf - p99 - d. aa sequence to the protein function (heamoglobin) #al2/3.2 prote n structure levels#
- S20-22 4 p2-2020.pdf - p41 - (c) collagen
  - p2-2020.pdf - p41 - c.i. the covalent bond between the amino acids #al2/3.1 amino acid#
  - p2-2020.pdf - p41 - c.ii ** collagen polypeptide structure and the collagen function #al2 3.7 fibrous protein#
- S20-22 p2-2020.pdf - p42 - 5 b
  - p2-2020.pdf - p42 - b. chemical bonds between sugar monomers #al2/2.2 monomer and polymer#
- S20-23 p2-2020.pdf - p56 - 4bd
  - p2-2020.pdf - p56 - b. ** phospholipid is suitable for cell membrane #al2/2.9 lipids#
  - p2-2020.pdf - p57 - d. experiment design to test non-reducing sugar #al2/1.testing for b

ological molecules#

- W20-22 p2-2020.pdf - p93 - 5 a
  - p2-2020.pdf - p93 - a. sucrose are made of a-glucose and fructose #al2/2.4 reducing and non-reducing sugar#
- W20-23 p2-2020.pdf - p111 - 5 ab,
  - p2-2020.pdf - p111 - a. polypeptide condensation reaction #al2/3.1 amino acid#
  - a. p2-2020.pdf - p111 - iii. the importance of glycine in a collagen #al2/3.7 fibrous protein#
  - p2-2020.pdf - p112 - b. *** collagen function and structure #al2/3.7 fibrous protein#
- S21-23 1 p2-2021.pdf - p50 - (b), 3p2-2021.pdf - p54 - (b), 4p2-2021.pdf - p56 - (a)
  - 1. p2-2021.pdf - p50 - b. the structure of phospholipid #al2/2.9 lipids#
  - 3. p2-2021.pdf - p54 - b. ** the peptide bond vs the bond in tertiary structure #al2/3.2 rotein structure levels#
  - 4. p2-2021.pdf - p56 - a. define disaccharide and polysaccharide #al2/2.2 monomer and polymer#
- w21-22 3 p2-2021.pdf - p86 - (c)
  - p2-2021.pdf - p86 - (c). the structure of protein polyhedrin #al2/3.2 protein structure levls#
- W21-23 1 p2-2021.pdf - p99 - (b), 4p2-2021.pdf - p106 - (a),6p2-2021.pdf - p111 - (a)
  - 1. p2-2021.pdf - p99 - b ** haemoglobin amino acid change and protein function #al2/.4 globular protein# #al2/3.2 protein structure levels#
  - 4. p2-2021.pdf - p106 - a. cellulose to microfibril #al2/2.7 starch glycogen and cellulos#
  - 6. p2-2021.pdf - p111 - a compare DNA and collagen #al2/3.7 fibrous protein#

chapter 3. enzymes

- M17-22 9700_m17_qp_22.pdf - p6 - 3ab
  - a. identify competitive and non-competitive inhibitors #al3/2.1 affecting factors#
  - b. compare Vmax, and Km #al3/2.2 Vmax and Km#
- W18-22 2C p2-2018.pdf - p89 - (iii)
  - c. p2-2018.pdf - p89 - (iii) . the effects of non-competitive inhibitors on enzymes #al3/21 affecting factors#
- S18-22 6 p2-2018.pdf - p46 - (a)
  - p2-2018.pdf - p46 - (a) the effects of competitive inhibitors on enzymes #al3/2.1 affectin factors#
- M18-22 3 9700_m18_qp_22.pdf - p9 - (b) c

- p2-2018.pdf - p9 - b.i. the commercial use of enzymes #al3/2.4 the commercial application#
  - p2-2018.pdf - p9 - b.ii. immobilized enzymes #al3/2.4 the commercial application#
  - p2-2018.pdf - p9 - b.iii. the immobilized enzymes #al3/2.4 the commercial application#
  - p2-2018.pdf - p9 - c. outline the investigation of enzyme catalysed reaction *** #al3/1.3 nvestigate the enzyme reaction#
- S19-22 p2-2019.pdf - p46 - 6 ***
  - p2-2019.pdf - p46 - a.i. describe the measurement of reaction *** #al3/1.3 investigate th enzyme reaction#
  - p2-2019.pdf - p46 - a.ii. surface area #al3/2.1 affecting factors#
  - p2-2019.pdf - p47 - b. the temperature affects enzyme activity #al3/2.1 affecting factors#
- S19-21 p2-2019.pdf - p24 - 3
  - a. p2-2019.pdf - p24 - i. experiment analysis #al3/1.3 investigate the enzyme reaction#
  - a. p2-2019.pdf - p25 - ii. result explanation, copper and potassium #al3/1.3 investigate he enzyme reaction#
  - p2-2019.pdf - p25 - b. immobilised enzymes 经典答案 #al3/2.4 the commercial applicati n#
- M19-22 2 p2-2019.pdf - p4 - a
  - p2-2019.pdf - p4 - a. the feature of enzymes 经典答案 #al3/1.1 mode of enzyme action#
- W20-23 5 p2-2020.pdf - p112 - (c)d
  - p2-2020.pdf - p112 - c. the induced fit model经典答案 #al3/1.3 investigate the enzyme r action#
  - p2-2020.pdf - p113 - d. the effects of pH #al3/2.1 affecting factors#
- W20-22 5 b p2-2020.pdf - p94 - (c)
  - p2-2020.pdf - p93 - b. the feature of enzymes #al3/1.1 mode of enzyme action#
  - p2-2020.pdf - p94 - c. commercial use of enzymes#al3/2.4 the commercial application#
- S20-23 p2-2020.pdf - p58 - 4e .f, 除了KM外，整个题都比较综合
  - p2-2020.pdf - p58 - e.i. Km #al3/2.2 Vmax and Km#
  - p2-2020.pdf - p58 - e.ii. the lysosome
  - p2-2020.pdf - p58 - e.iii. intracellular and extracellular enzymes
  - p2-2020.pdf - p59 - f. the ph #al3/2.1 affecting factors#
- S20-22 5b p2-2020.pdf - p43 - (iii)
  - p2-2020.pdf - p43 - (iii).induced fit model #al3/1.1 mode of enzyme action#
- W21-23 p2-2021.pdf - p100 - 2 ***
  - p2-2021.pdf - p100 - a. calculate the initial rate #al3/1.3 investigate the enzyme reaction#
  - b. p2-2021.pdf - p100 - i. competitive inhibitor #al3/2.1 affecting factors#

- b. p2-2021.pdf - p101 - ii. temperature #al3/2.1 affecting factors#
  - p2-2021.pdf - p101 - c. initial rate #al3/1.3 investigate the enzyme reaction#

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  - d. p2-2018.pdf - p3 - (i. the fluid mosaic model #al4/1.1 membrane structure#
  - d. p2-2018.pdf - p3 - ii. the membrane permeability #al4/1.1 membrane structure#
- S18-22 3 p2-2018.pdf - p39 - (b)
  - b.i passive #al4/2.1 transport#
  - b.ii. the feature of transport protein #al4/2.1 transport#
- S18-23 1 p2-2018.pdf - p52 - (c)
  - ii.facilitated diffusion #al4/2.1 transport#
  - iii. cell signalling #al4/1.4 cell signalling#
- w18-22 3 p2-2018.pdf - p91 - (c)
  - cell signalling #al4/1.4 cell signalling#
- m19-22 5 p2-2019.pdf - p12 - bc
  - b. p2-2019.pdf - p13 - ii. visking tubing #al4/2.2 transport investigation#
  - p2-2019.pdf - p13 - c. glucose crosses cell membrane by facilitated diffusion #al4/2.1 transport#
  - p2-2019.pdf - p14 - d. cell signalling #al4/1.4 cell signalling#
- M19-21 p2-2019.pdf - p22 - 2ac
  - p2-2019.pdf - p22 - 2a. membrane fluidity, unsaturated fatty acid #al4/1.1 membrane structure#
  - 2 p2-2019.pdf - p23 - c. cell signalling #al4/1.4 cell signalling#
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  - p2-2019.pdf - p45 - b. phospholipid, bilayer #al4/1.1 membrane structure#
- W19-22 3 p2-2019.pdf - p88 - (d) e
  - p2-2019.pdf - p88 - (d).diffusion and surface #al4/2.2 transport investigation#
  - p2-2019.pdf - p88 - e. water potential, osmosis and red blood cells #al4/2.6 osmosis#
- W19-23 p2-2019.pdf - p110 - 6
  - the cell membrane structure #al4/1.1 membrane structure#
- S20-23 p2-2020.pdf - p62 - 6 osmosis #al4/2.6 osmosis#
- w20-23 p2-2020.pdf - p114 - 6 p2-2020.pdf - p115 - b

- p2-2020.pdf - p115 - b.i. endocytosis process #al4/2.1 transport#
  - p2-2020.pdf - p115 - b.ii. lysosome function #al4/2.1 transport#
- S21-22 2 p2-2021.pdf - p38 - (b) , 4p2-2021.pdf - p41 - (b)
  - 2 p2-2021.pdf - p38 - (b) . cell membrane #al4/1.1 membrane structure#
  - 2. p2-2021.pdf - p38 - c. receptor #al4/1.4 cell signalling#
  - 4 p2-2021.pdf - p41 - (b) .SA/V #al4/2.2 transport investigation#
- W21-22 1 p2-2021.pdf - p82 - (b)
  - 1 p2-2021.pdf - p82 - (b) . cell membrane function and structure #al4/1.1 membrane st ucture#

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- W18-23 3 p2-2018.pdf - p108 - bcd telomeres #al5/1.4 telomeres#
- W18-23 6
  - 6 p2-2018.pdf - p114 - a. mitosis process #al5/1.3 mitotic events#
  - 6 p2-2018.pdf - p115 - b. the importance of mitosis #al5/1.2 the importance of mitosis#
- W18-22 p2-2018.pdf - p91 - 3
  - p2-2018.pdf - p91 - a. the importance of mitosis #al5/1.2 the importance of mitosis#
  - p2-2018.pdf - p91 - b. role stem cell #al5/1.5 stem cell#
- S18-23 p2-2018.pdf - p50 - 1
  - p2-2018.pdf - p50 - a.b. identify the stage of mitosis #al5/2.2 identify mitotic cells#
  - p2-2018.pdf - p50 - c. describe the mitosis events #al5/1.3 mitotic events#
- S18-22 p2-2018.pdf - p42 - 4
  - p2-2018.pdf - p42 - a.p2-2018.pdf - p42 - b. mitotic events #al5/1.3 mitotic events#
  - p2-2018.pdf - p42 - c. microscopy? #al1/1 microscopy#
- M18-22 6 p2-2018.pdf - p13 - b
  - p2-2018.pdf - p13 - i. identification #al5/2.2 identify mitotic cells#
  - p2-2018.pdf - p13 - iii. mitotic event #al5/1.3 mitotic events#
- w19-23 p2-2019.pdf - p100 - 2
  - p2-2019.pdf - p101 - a. identify the stage of mitosis #al5/2.2 identify mitotic cells#
  - p2-2019.pdf - p101 - b. mitotic index #al5/2.2 identify mitotic cells#
  - p2-2019.pdf - p101 - c. cytokinesis event #al5/1.3 mitotic events#
- w19-22 p2-2019.pdf - p94 - 6 telomeres
  - p2-2019.pdf - p94 - a. the importance of telomeres #al5/1.4 telomeres#

- p2-2019.pdf - p94 - b. telomeres and cancer and stem cells #al5/1.4 telomeres#
- S19-21 p2-2019.pdf - p26 - 4
  - p2-2019.pdf - p27 - a. the importance of stem cell #al5/1.5 stem cell#
  - p2-2019.pdf - p27 - b. describe the cell division #al5/1.3 mitotic events#
- M19-22 p2-2019.pdf - p15 - 6
  - p2-2019.pdf - p15 - a. the importance of mitosis #al5/1.2 the importance of mitosis#
  - p2-2019.pdf - p15 - b. spindle fibre #al5/2.1 chromosome and spindle#
- W20-23 p2-2020.pdf - p106 - 3
  - p2-2020.pdf - p106 - a. DNA change during mitosis #al5/2.1 chromosome and spindle#
  - p2-2020.pdf - p108 - b. role of stem cells #al5/1.5 stem cell#
- W20-22 p2-2020.pdf - p90 - 4b
  - p2-2020.pdf - p91 - b. the mitotic events #al5/1.3 mitotic events#
- w20-21 6 p2-2020.pdf - p79 - i
  - a p2-2020.pdf - p79 - i. cancer development #al5/1.6 cancer#
- S20-23 p2-2020.pdf - p60 - 5
  - p2-2020.pdf - p60 - b. the role of each stage #al5/1.3 mitotic events#
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- S20-22 p2-2020.pdf - p45 - 6
  - p2-2020.pdf - p45 - a. the stages of mitosis #al5/1.3 mitotic events#
  - p2-2020.pdf - p46 - b. the events of mitosis #al5/1.3 mitotic events#
- w21-22 1 p2-2021.pdf - p83 - (d),
  - p2-2021.pdf - p83 - (d). identify the cells #al5/2.2 identify mitotic cells#
- S21-23 p2-2021.pdf - p62 - 6
  - p2-2021.pdf - p63 - b. chromosome structure #al5/1.1 chromosome structure#
  - p2-2021.pdf - p63 - c. mitotic events #al5/1.3 mitotic events#
  - p2-2021.pdf - p63 - d. mitotic stages #al5/1.3 mitotic events#
- S21-22 p2-2021.pdf - p34 - 1
  - a. p2-2021.pdf - p34 - i. identify the cells #al5/2.2 identify mitotic cells#
  - a. p2-2021.pdf - p34 - ii. the function of microtubules #al5/2.1 chromosome and spindl #

Chapter 6. nucleic acid and protein synthesis

- W18-22 p2-2018.pdf - p98 - 5

- p2-2018.pdf - p98 - a. RNA, polymer, macromolecule #al6/1.3 DNA and RNA#
  - p2-2018.pdf - p98 - b. reducing sugar test
  - p2-2018.pdf - p99 - c. DNA nucleotide vs RNA #al6/1.3 DNA and RNA#
- S18-22 p2-2018.pdf - p36 - 2 ***综合
  - p2-2018.pdf - p36 - a.i. ATGC name #al6/1.1 nucleotide#
  - p2-2018.pdf - p36 - a.ii. DNA structure #al6/1.3 DNA and RNA#
  - p2-2018.pdf - p37 - b. nucleotide structure #al6/1.1 nucleotide#
  - p2-2018.pdf - p37 - c. protein structure #al2/3.2 protein structure levels#
- W18-23 p2-2018.pdf - p107 - 3abcd telomeres
  - p2-2018.pdf - p107 - ai. nucleotide structure #al6/1.1 nucleotide#
  - p2-2018.pdf - p107 - a.ii. DNA vs RNA #al6/1.3 DNA and RNA#
  - p2-2018.pdf - p108 - b. DNA replication #al6/1.4 DNA replication#
  - p2-2018.pdf - p109 - c. DNA structure #al6/1.3 DNA and RNA#
- S18-23 3 p2-2018.pdf - p56 - (d) mutation ** #al6/2.6 mutation#
- S18-23 4 p2-2018.pdf - p60 - (d) mutation Hbs 经典Hb问题 #al6/2.6 mutation#
  - 1 base substitution (in gene coding for, β-globin / polypeptide) ;
    2 different / altered, mRNA codon ;
    3 different tRNA brings a different amino acid (to ribosome) / leads to a change in one amino acid (in the polypeptide chain) ;
    4 altered, primary structure / sequence of amino acids (in β-globin) ;
    5 changed, tertiary / quaternary, structure ;
    6 haemoglobin / molecule, less soluble ;
    7 (haemoglobin) molecules, stick together / form fibres ;
    8 (haemoglobin) less able to bind oxygen / AW ;

    points above may be qualified
    9 details ; ;
    + e.g. thymine / T, replaces, adenine / A
    10 in sixth, codon / triplet **or** sixth amino acid in sequence is changed
    (non-template strand) GTG instead of GAG / GTA instead of GAA
    or
    (template strand) CAC instead of CTC / CAT instead of CTT
    mRNA codon is, GUG instead of GAG / GUA instead of GAA

    11 (amino acid change is) valine instead of glutamic acid ;
    12 amino acid with non-polar side chain instead of polar side chain ;
    13 position of amino acid, is to the exterior / faces cytosol ;
- M18-22 p2-2018.pdf - p12 - 6 p2-2018.pdf - p12 - a. DNA replication #al6/1.4 DNA replication#
- w19-23 3 p2-2019.pdf - p104 - (b) microRNA, translation #al6/2.4 translation#
- w19-22 4 p2-2019.pdf - p90 - (c) semi-conservative replication #al6/1.4 DNA replication#

- **1** DNA (double helix / molecule) unwinds ;
  I unzips
  R DNA, strand / α helix, unwinds

  2 hydrogen bonds break between, base pairs / bases / strands ;
  A hydrogen bonds break between nucleotides *only if clear that two strands are separated*

  3 both strands used as templates ; *concise statement*

  4 DNA polymerase, qualified ;
  e.g. involved in polynucleotide formation / phosphodiester bond formation / catalyses synthesis
  R joins phosphates

  5 *ref. to* (free) activated (DNA) nucleotides / AW ;
  A phosphorylated nucleotides
  R RNA nucleotides

  6 complementary (DNA) nucleotides added ;
  R RNA nucleotides
  A described in terms of complementary base pairing
  A A pairs with T and C pairs with G

  7 *idea that* process, occurs / continues, along whole DNA molecule ;

  8 *ref. to* Okazaki fragments / movement of polymerase in one direction / nucleotides added in one direction ;
  A correct ref. to leading and lagging strands

  9 each newly formed molecule contains one original and one newly synthesised strand ;

  10 AVP ;
  e.g. replication bubbles form / described
  ref. to repair / proofreading
  ref. to helicase (unwinding) / ligase (joining Okazaki fragments) *in correct context*
  R ligase joining phosphates
  process occurs, step-by-step / sequentially / AW
  ref. to RNA primers

- S19-23 p2-2019.pdf - p50 - 1

- p2-2019.pdf - p50 - a. DNA structure #al6/1.3 DNA and RNA#
  - p2-2019.pdf - p50 - b. DNA structure #al6/1.3 DNA and RNA#
  - p2-2019.pdf - p50 - c. replication process #al6/1.4 DNA replication#
- S19-21 p2-2019.pdf - p30 - 6
  - p2-2019.pdf - p30 - a. DNA structure #al6/1.3 DNA and RNA#
  - p2-2019.pdf - p30 - b. tRNA structure and function #al6/2.4 translation#
- M19-22 6 p2-2019.pdf - p15 - c nucleotide #al6/1.1 nucleotide#
- W20-22 p2-2020.pdf - p84 - 2bc,
  - p2-2020.pdf - p85 - b. transcription #al6/2.3 transcription#
  - p2-2020.pdf - p86 - c. mutation, rifampicin, RNA polumerase #al6/2.6 mutation#
- S20-22 p2-2020.pdf - p42 - 5(b) nucleotide #al6/1.1 nucleotide#
- W21-23 1
  - p2-2021.pdf - p98 - (a) translation process #al6/2.4 translation#
  - p2-2021.pdf - p99 - (b) mutation.
- w21-22 3 p2-2021.pdf - p87 - (d)5p2-2021.pdf - p90 - (a)
  - 3 p2-2021.pdf - p87 - (d). codon*** #al6/2.4 translation#
  - 5 p2-2021.pdf - p90 - (a) . RNA structure #al6/1.3 DNA and RNA#
- S21-23 3 p2-2021.pdf - p54 - (a). translation #al6/2.4 translation#
  - *any four from*
    1 mRNA, attaches to / associates with / AW, ribosome ;
    A ribosome reads mRNA

    2 two codons, exposed / AW ;
    A A and P sites / first and second binding sites, (on ribosome)

    3 tRNA, qualified carries an amino acid to ribosomes / each type carries a specific amino acid / first amino acid is met / tRNA with met / $tRNA^{met}$;
    ref. to ribosomes can be implied in mp 3 if mp1 gained

    4 anticodon (on tRNA) binds to codon (on mRNA) ; **I** matches
    A complementary / base, pairing between codon and anticodon
    A H-bonds form between bases on codon and anticodon
    R if anticodon on mRNA

    5 START (mRNA) codon / (mRNA) AUG first codon ;

    6 second tRNA with its amino acid binds next to first tRNA / (two) amino acids are held in place close to each other by tRNA binding / AW ;
    A *ref. to* two tRNAs next to each other

    7 (after peptide bond formation) first tRNA detaches / ribosome moves along one codon
    or
    process repeats / elongation occurs, until, STOP codon / polypeptide chain synthesised (and released from ribosome) ;

    8 tRNA molecules, reused / leave ribosome to attach to another amino acid ;
    must be in context of leaving after peptide bond formation

    9 AVP ; e.g. peptidyl transferase for peptide bond formation
    ref. to, 99 / 100 / 101, codons, qualified
    A number of bases in length of mRNA

原文链接：p2 questions

- S21-22 1 p2-2021.pdf - p35 - (b) replication process #al6/1.4 DNA replication#

Chapter 7. transport in plant

- W18-22 p2-2018.pdf - p88 - 2
  - p2-2018.pdf - p88 - a. xerophytic #al7/2.5.xerophytic#
  - p2-2018.pdf - p88 - b. phleom transport assimilates #al7/2.6.assimilates transport#
    - ii.

any two from

1 for, transport / translocation, **or** movement / AW, from source to sink ; } *accept assimilates / products of metabolism, if in context of cardiac glycosides*

I *ref. to* transport of, amino acids / sucrose

2 *ref. to* source, is place of synthesis / AW **or** sink is / movement to, area where not manufactured / storage area / area where they are required ;

3 as defence mechanism (e.g. against sap feeders) ;

- S18-23 p2-2018.pdf - p54 - 3
  - p2-2018.pdf - p54 - a. **explain xerophytic plants reduce water loss #al7/2.5.xerophytic#
    - *max 2 if only one section attempted*

three from:

multilayered epidermis
reduces, cuticular transpiration / loss of water vapour through cuticle ;
increases distance for diffusion (of water vapour to cuticle) ;
ref. to protection from heat from sunlight and reduced evaporation (from spongy mesophyll cells) ;

stomatal crypts
creates area of moist air / AW ; I traps water
minimises effect of, external air currents / wind ;
reduces / less steep, water potential gradient (between intercellular air space and external environment) ;
A water vapour potential gradient
A diffusion gradient if referenced to water vapour
ref. to only on lower surface / shaded, and reduced evaporation (from spongy mesophyll cells) ;
A lower temperature reduces rate of diffusion of water vapour (out via stomata)

  - p2-2018.pdf - p55 - b. phloem #al7/2.6.assimilates transport#
  - p2-2018.pdf - p55 - c. ** source and sink #al7/2.6.assimilates transport#
    -

allow named assimilates

source
in context of assimilates
site of synthesis ;
A described e.g. photosynthesis in leaf / storage compound breakdown in roots

sink
in context of, via phloem / from source / from leaf
I nutrients / substances, unqualifed *if assimilates / named assimilate, not stated when explaining source*

site where assimilates are stored
A described e.g. roots for storage of starch
or
area where, growth occurs / assimilates are used for growth
A described e.g. growth in developing buds / growth of immature leaf
or
area that receives, assimilates / AW ;
A area where sucrose unloaded

I place that needs assimilates
I place where assimilates are used, unless qualified

- S18-22 p2-2018.pdf - p35 - (d)1
  - p2-2018.pdf - p35 - i. definition of apoplastic pathway #al7/2.1.water transport#
  - p2-2018.pdf - p35 - ii. transpiration, water properties vs water movement to the air spac s in the leaf #al7/2.1.water transport#
  - p2-2018.pdf - p35 - iii. water vapour diffusion #al7/2.1.water transport#
- M18-22 p2-2018.pdf - p10 - 4
  - p2-2018.pdf - p10 - a. the movement of water from the soil to the cortex #al7/2.1.water t ansport#
  - p2-2018.pdf - p10 - b. mit in root #al7/2.1.water transport#
- w19-22 p2-2019.pdf - p82 - 1
  - p2-2019.pdf - p82 - a. identify the phloem in the graph #al7/1.1.recognition and destrib tion#
  - p2-2019.pdf - p82 - b. state the role of phloem sieve tubes #al7/2.6.assimilates transpor #
    - transport / translocation, of, assimilates / photosynthates / sucrose / sugars / amino acids / other named nutrient ; **I** food

      from, source / areas of synthesis, to, sink / areas of growth / areas of (high) activity / areas of storage ;

      A areas where they are needed *for sink*
      I 'where they used'
  - p2-2019.pdf - p83 - c. the epidermics/microscopy #al7/1.1.recognition and destribution#

- p2-2019.pdf - p83 - d. draw plant cell
- s19-23 p2-2019.pdf - p58 - 4
  - p2-2019.pdf - p58 - a. phloem sieve tube element vs xylem vessel element #al7/1.4.structure and function phloem and xylem#
    - (a) Describe **two** differences between the structure of a phloem sieve tube element and a xylem vessel element.
    - *any two from:*

      note that some mark points must have both xylem and phloem mentioned ('v') and some mark points only need xylem or phloem ('or' – below the line)

xylem		*phloem*	
no cytoplasm / hollow / no contents	v	(peripheral / little / some) cytoplasm **I** protoplasm **R** full of cytoplasm / AW **or** has (a few) organelles **A** examples of organelles mitochondria or ER **I** has SER / RER / ribosomes **R** has nucleus	;
lignified **R** *idea of* lignin within element	v	no lignin / (only) cellulose	;
no end wall(s) / no sieve plate(s) **A** end walls have broken down	**or**	sieve plate(s) / perforated end wall (s) **A** (end walls) have sieve pores	
(side walls) contain pits **R** piths	**or**	no pits ;	;
no plasmodesmata	**or**	plasmodesmata (to companion cells) ;	;
thick(er), cell wall / walled	**or**	thin(ner), cell wall / walled	;

      thicker lignified wall = thicker wall mark only (for lignin mark need to state what phloem has)

  - p2-2019.pdf - p58 - b. sucrose experiment #al2/1.testing for biological molecules#
- s19-22 p2-2019.pdf - p34 - 1
  - p2-2019.pdf - p34 - a. the structural feature of the stem #al7/1.1.recognition and destribution#
  - p2-2019.pdf - p34 - b. the function of large vacuole #al7/3.others#
    - *any two from:*
      (hydrostatic) support / described ;
      R *if incorrect context e.g. support because of thick cell walls*
      A packing tissue

      (cells), turgid / store <u>water</u> ;

      storage ;
      in context of substances other than water e.g. sucrose / starch / waste

原文链接：p2 questions

- p2-2019.pdf - p35 - c. identify the vascular bundle #al7/1.1.recognition and destribution#
    - p2-2019.pdf - p35 - d. phloem sieve tube element vs xylem vessel element #al7/1.4.structure and function phloem and xylem#
- s19-21 4 p2-2019.pdf - p27 - c sieve tube elements, structure vs function #al7/1.4.structue and function phloem and xylem#
- m19-22 p2-2019.pdf - p2 - 1
    - p2-2019.pdf - p3 - a. identify the tissues in leaf #al7/1.1.recognition and destribution#
    - p2-2019.pdf - p3 - b. compare the micrograph, xerophytic features #al7/1.1.recognition nd destribution#
    - p2-2019.pdf - p3 - c. transpiration and gas exchange #al7/2.1.water transport#
- w20-23 p2-2020.pdf - p104 - 2
    - p2-2020.pdf - p105 - a. function vs structure, mesophyll cells, sieve tube element #al7/1. .structure and function phloem and xylem#
    - p2-2020.pdf - p105 - b. movement of sucrose in leaves #al7/1.4.structure and function p loem and xylem#
- w20-22 p2-2020.pdf - p82 - 1
    - p2-2020.pdf - p82 - a. the movement of water in leaf #al7/2.1.water transport#
    - p2-2020.pdf - p83 - b. the transpiration of water in leaf #al7/2.1.water transport#
- s20-23 p2-2020.pdf - p50 - 1
    - p2-2020.pdf - p50 - a. identify the xylem #al7/1.1.recognition and destribution#
    - p2-2020.pdf - p50 - b. water property, movement in xylem #al7/2.1.water transport#
    - p2-2020.pdf - p51 - c. the movement of water between cells #al7/2.1.water transport#
    - c p2-2020.pdf - p51 - ii. the feature of parenchyma cell #al7/3.others#
- s20-22 p2-2020.pdf - p42 - 5(a) ** hydrostatic pressure and water movement #al7/2.6.assmilates transport#
    - Describe **and** explain how the transfer of sucrose into a phloem sieve tube from a companion cell can lead to the transport of the sugar to a sink.
    - presence of sucrose (in sieve tube) lowers water potential (of phloem sap) ; **A** makes water potential more negative
      water enters (sieve tube), by osmosis / down water potential gradient ;
      increases volume (in sieve tube) ;
      increases hydrostatic pressure (in sieve tube at source) ; **A** turgor pressure
      ref. to lower hydrostatic pressure (in sieve tube at sink) ;
      allow ecf for no ref. to, hydrostatic / turgor
      detail ; e.g. sucrose removed at sink
      water follows sucrose that exits sink
      movement of, (phloem) sap / sucrose, down pressure gradient / from high to low hydrostatic pressure ;
      mass flow ;
- w21-23 4 p2-2021.pdf - p107 - (c) stomata and transpiration #al7/2.1.water transport#
- w21-22 p2-2021.pdf - p88 - 4, transpiration #al7/2.1.water transport#

- p2-2021.pdf - p88 - a. water property #al7/2.1.water transport#
  - p2-2021.pdf - p88 - b. transpiration and gas exchage #al7/2.1.water transport#
    - i. *any **two** from:*

      1 higher rate of transpiration during the day / lower rate of transpiration during the night / AW ;
      A flow of xylem sap *for transpiration*

      2 stomata are open during the day ; **ora** *must be in context of transpiration*

      if mp1 and mp2 not gained, allow one mark for idea that results are related to pattern of, light / daylight / day, and, dark / night (use an ordinary tick)

      3 *idea that* all three vines were kept in the same conditions so a changed condition that affects transpiration will affect a three ;
      A all three vines have the same external factors acting that affect transpiration

      4 AVP ; e.g. (during daylight) stomata open, to obtain carbon dioxide / for photosynthesis
      idea that, increasing / decreasing, rate is related to degree of opening of stomata varying with light intensity

    - ii. *allow (xylem sap) flow rate for rate of transpiration*
      *any **two** from:*

      1 the greater the (total) area of leaf, the higher the rate of transpiration ; **ora**
      A grapevine 1 has largest leaf area and highest rate of transpiration
      accept other comparisons
      R *ref. to* SA:V but allow ecf in mp2

      2 the greater the (total) area of leaf, the more stomata are present ; AW
      A more leaves means more stomata

      3 detail of any one grapevine ;
      e.g. grapevine 1 = highest transpiration rate and, highest number of / most, stomata
      grapevine 3 = lowest transpiration rate and, lowest number of / least, stomata
      allow use of comparative data to support mp
      (if detail includes ref. to (total) leaf area then check to see if mp2 can also be awarded)

      4 *ref. to* relationship between (total) internal surface area and (total) leaf area ;
      e.g. larger leaf surface area means internal surface area increased

      5 *ref. to* relationship between internal surface areas and rates of evaporation ;

      6 AVP ; higher rate of flow of xylem sap for largest leaf area as (overall) more water used in metabolism AW **ora**
      (greater area so) more leaves so more xylem vessels **ora**

  - p2-2021.pdf - p89 - ii.-iv. transpiration and leaf feature #al7/2.1.water transport#
    - iii. overcast / cloudy / rain / shade / AW ;
      A lower wind speed / temperature
      A higher humidity

      R if described as stomata close (transpiration is still occurring)

    - iv.

valid method e.g.
draw around / place, leaf on, squared paper / graph paper / grids ;
A square ruler
count number of (full) squares ; **R** multiply by two / do it on other side
method for part squares ; e.g. add up all part squares and divide by 2
match a larger part square with a smaller and count as one square
use graph paper with larger and smaller squares
or
photocopy leaves, cut out and weigh (cut out) ;
divide mass by mass of 1 cm^3 of same paper ;
or
ref. to using an App ;
further detail ; e.g. place leaf, flat / on white surface ;
take photo of single leaf with smart phone / AW

- s21-23 4 p2-2021.pdf - p56 - (b)
  - p2-2021.pdf - p56 - i. draw the sieve tube element #al7/1.4.structure and function phlo m and xylem#
  - p2-2021.pdf - p57 - ii. the change of water potential & hydrostatic pressure #al7/2.6.ass milates transport#
    - influx / entry / AW, of sucrose / organic compounds / assimilates / photosynthates / named ;
      A active loading *for entry*
      R active transport / cotransport / facilitated diffusion
      R incorrect cell type named as donor cell e.g. xylem / mesophyll
      must have idea of entry – stating that they are present in the phloem sieve tube is not enough

      water enters (from xylem), by osmosis / down water potential gradient
      / from high(er) to low(er) water potential
      / from less negative to more negative water potential ;
      A Ψ for water potential
      A water enters, increasing volume

- s21-22 p2-2021.pdf - p36 - 2
  - p2-2021.pdf - p36 - a. ** photosynthesis, transpiration #al7/2.1.water transport#
    -

any three from
decrease in sugar
1 *idea that* changing / transition, from sink to source
e.g. leaf becomes the source
leaf no longer the sink
sugars are (now) being moved away from leaf
was a growing area, now translocating (sugars)

2 photosynthesis provides enough sugar / (rate of) photosynthesis increases ;
A leaf (now) makes enough sugar
I makes own food

increase in water to max 2
3 increase in size / more cells / increase in (leaf) surface area, (so proportionate increase in water) ;

4 (more cells that need) water to, maintain turgidity / prevent flaccidity / prevent wilting, (because of transpiration) ;

5 increased transpiration / greater number of stomata ;
A increased evaporation (greater internal leaf area)

6 water is, a reactant / needed, for photosynthesis ;
(in context of increased photosynthesis, more water needed)

7 AVP ; e.g. maturing leaf growth rate slows / mature leaf no growth
(more cells, so more) water needed for, cellular reactions / AW
e.g. for hydrolysis of starch
(more) water needed for, cell elongation / enlarging vacuoles

- p2-2021.pdf - p36 - b. the feature of companion cell, sieve element and xylem element al7/1.4.structure and function phloem and xylem#
-

feature	companion cells	phloem sieve tube element	xylem vessel element
cytoplasm	✓	✓	x
cell surface membrane	✓	✓	x
lignified cell wall	x	x	✓
nucleus	✓	x	x

- s22-22 9700_s22_qp_22.pdf - p16 - 6
  - 9700_s22_qp_22.pdf - p16 - a. ions in phloem
  - 9700_s22_qp_22.pdf - p16 - b. the feature of phloem tissue

Chapter 8. transport in animals

- W18-23 p2-2018.pdf - p110 - 4 SAN AVN Purkyne fibres #al8/3.2 cardiac cycle#

- ɜny *four from*
  I signals
  R nerve impulse first time

  SAN
  1 acts as a pacemaker / initiates heart beat / initiates cardiac cycle ;
  A regulates heartbeat
  A described, e.g. as rhythm / emits impulses at regular intervals

  2 releases / AW, waves of excitation / (electrical) impulses ;
  A *ref.* to, action potentials / depolarisation
  R nerve impulses

  3 spread across / AW, atria / atrial walls **or** leads to atrial, systole / contraction(s) ;

  AVN
  4 allows a (short) delay / ~0.1 s ;

  5 passes the impulse / wave of excitation, to the Purkyne fibres / down the septum ;
  A Bundle of His
  R nerve impulse

  6 detail ;
  e.g. so atria contract before ventricles
  allows ventricles to fill / allow atria to empty completely
  so atria have, emptied / contracted, before ventricular contraction begins
  so atria and ventricles don't contract at the same time

- W18-22 2 p2-2018.pdf - p90 - (d)
  - p2-2018.pdf - p90 - i. *** blood pressure and cardiac cycle event #al8/3.2 cardiac cycle#
    -

allow *systole for contraction and diastole for relaxation*
bicuspid valve or mitral valve for (left) atrioventricular
aortic valve for semi-lunar valves

any four from (max 3 if whole response based on right side of heart)
before atrial contraction / during relaxation of the left atrium and left ventricle

1 atrioventricular valve, opens / is open **A** *following atrial contraction*
or
blood trickling into ventricle / some blood enters ventricle ;

2 atrial contraction, blood flow to ventricles / ventricles fill (with blood)
or
atrial contraction then ventricular contraction ;

ventricular contraction

3 biscuspid valve closes and semi-lunar valve opens ;
R *if occurs before ventricular contraction*

4 blood flows into aorta ;
R if states 'from atrium' or 'then to lungs'
R *if occurs before ventricular contraction*

5 *ref. to* atrium in relaxation during ventricular contraction ;

pressure changes

6 contraction of, atrium / ventricle, increases pressure (of that chamber)
or
ref. to (blood) pressure differences to cause opening or closing of valves ;
e.g. pressure in atrium greater than in ventricle so atrioventricular valve opens
pressure in ventricle greater than aorta so semilunar valves open
pressure in ventricle greater than atrium so bicuspid valve closes

- p2-2018.pdf - p90 - ii. muscle cell contract and heart failure #al8/3.2 cardiac cycle#
  - **I** *ref. to* fibrillation / cardiac cycle rhythm

    any three from

    1 more powerful contraction of (cardiac) muscle / increased ability for (cardiac) muscle (**A** cardiac cells) to contract ;
    A stronger contraction / contract strongly / increased contractility
    I contracts more / increased contraction

    2 blood (pumped) at higher pressure ; **I** blood at high pressure

    3 more force to overcome resistance (in blood vessels) ;

    4 more blood reaches lungs to obtain oxygen (per unit time) / more oxygen reaches (rest of) body / tissues (per unit time) (in blood) ;
    allow idea of efficient delivery of oxygen
    A more oxygenated blood can be delivered to heart, muscle / tissue AW

    5 less fatigue / increased energy / increased mobility / AW ;

- w18-22 p2-2018.pdf - p100 - 6
  - p2-2018.pdf - p100 - b. ** red blood cell #al8/2 O2 and CO2 transport#
    - **A** iron / Fe ;
      I oxidation status of Fe
      A iron atom / iron ion
      R iron molecule
      B carbaminohaemoglobin ;
      C haemoglobinic acid ;

- S18-23 2 p2-2018.pdf - p53 - d) . * red blood cell can not metabolise fatty acids #al8/2 O2 and CO2 transport#
- S18-23 4 p2-2018.pdf - p59 - (b) ** the advantages of oxygen dissociation curve #al8/2 O and CO2 transport#
  - 1 higher partial pressures in lungs / lower partial pressures in (respiring) tissues ;
    A correct values / range of values, of kPa
    A in alveoli

    advantages of differences (higher v lower partial pressure)
    only higher partial pressure or lower partial pressure explanation required to gain mark

    2 oxygen, binds to v released from, haemoglobin
    or
    oxyhaemoglobin, is formed v dissociates / AW ;
    3 (so) percentage saturation of haemoglobin (with oxygen) high v low ;
    4 affinity of haemoglobin for oxygen high v low ;
    5 data from Fig. 4.1 to support ;
    6 (body), cells / tissues, need oxygen for aerobic respiration ;

- M18-22 p2-2018.pdf - p11 - 5
  - p2-2018.pdf - p11 - a. ***outline the role of SAN and AVN #al8/3.2 cardiac cycle#
    - *any **three** across both sections:*

      SAN (max **two**):
      1 pacemaker / sets rate of heart beat / responsible for rhythmic contraction ;
      2 sends out, impulses / waves of excitation / waves of depolarisation ;
      3 initiates / brings about / AW, heart beat / contraction of the heart / atrial contraction / atrial systole ;

      *AVN (max **two**)*:
      4 acts to relay impulses / described ;
      5 introduces delay to ventricular, systole / contraction(s) / prevents simultaneous contraction of atria and ventricles / AW ;
      A allows time for, atria to empty / ventricles to fill
      6 conducts, waves of excitation / impulses, to, bundle of His / Purkyne fibres ;

  - p2-2018.pdf - p11 - b. ** the structure of blood vessel #al8/1.2 blood vessels#

- The inner layer of the walls of **D** and **E** is composed of endothelial tissue.

  List two structural features of this tissue.

  - *any **two** from:*

    single layer / one cell thick ;
    flattened / thin, cells ;
    A squamous / pavement, cells / epithelia
    smooth surface (facing lumen) ;

- w19-23 p2-2019.pdf - p104 - 4
  - p2-2019.pdf - p104 - a. ***explain artery structure and function #al8/1.2 blood vessels#
    - *artery wall*

      I *narrow lumen to maintain high (blood) pressure*
      I *ref. to valves / ref. to inner lining being wrinkled or wavy*

      1 thick, walled / tunica media, to withstand high (blood) pressure / prevent bursting ;

      2 endothelium / endothelial cells / tunica intima, are smooth, little friction to blood flow / easy flow of blood / no eddies of blood flow / AW ;

      3 elastic, tissue / fibres, stretches to allow surges in blood flow / recoils to maintain blood pressure *or* force blood forward ;

      4 smooth muscle (contracts to), maintains / regulates / controls blood flow ;
      A smooth muscle distributes blood

      5 collagen fibres, avoid rupturing / bursting ;

  - p2-2019.pdf - p105 - b.i. identify/the structure feature red blood cells under microscopy #al8/1.5 blood cells#
    - red blood cells / erythrocytes ; **R** red and white blood cells

      one from
      biconcave (shape) ;
      no nucleus ;
      idea of uniform, cytoplasm / cell contents ;
      idea of rouleau / stacked cells ; **I** 'clumped'
      I size

  - p2-2019.pdf - p105 - b.ii. *** differences between arteriole and capillary #al8/1.2 blood v ssels#

- *assuming arteriole unless told otherwise, accept alternative terminology for layers of wall of arteriole*
  I *ref. to folding*

  1 thicker wall / more than one layer of cells in wall / has tunica intima, tunica media and tunica adventitia whereas capillary has tunica intima ; **A** endothelium for tunica intima

  2 more cells forming, perimeter / tunica intima ;

  3 wider (vessel) / wider lumen / AW ; **A** actual width(s)

  4 nucleus / nuclei, present in wall only in arteriole ;

  5 cells lining lumen / endothelial cells, are thicker ;

  6 lumen smaller, relative to the, thickness of the wall / overall width ;

  7 more (red blood) cells (in lumen) ;

  8 nuclei projecting inwards only in arteriole ;

  9 AVP ; e.g. *ref. to* smooth muscle cells
  capillaries are surrounded by cells
  correct calculation of actual sizes using magnifications in Fig. 4.1 arteriole 20–35 μm and capillary 6–7 μm

    - p2-2019.pdf - p106 - c. the formation of tissue fluid
- S19-23 p2-2019.pdf - p60 - 5
    - a. p2-2019.pdf - p60 - i. cell recognition and function #al8/1.5 blood cells#
    - a. p2-2019.pdf - p60 - ii. red blood cell, osmosis #al8/1.5 blood cells#
- S19-23 p2-2019.pdf - p63 - 6
    - p2-2019.pdf - p63 - a. ** 标记组织名称 heart structure and function #al8/3.1 heart structu e and function#
    - p2-2019.pdf - p64 - c. the disadvantage that cardiac cell can not divide #al8/3.1 heart str cture and function#
        - *in context of cardiac myocyte or overall heart function*
          unable to replace, damaged / worn out / old, cardiac myocytes ;
          R repair myocytes

          unable to repair (damaged) cardiac, muscle / tissue ; **A** heart tissue

          repair (to cardiac muscle may be) with, unspecialised cells / scar tissue ;
- S19-22 p2-2019.pdf - p38 - 3
    - p2-2019.pdf - p38 - a. ***recognize blood cells #al8/1.5 blood cells#
    - c. p2-2019.pdf - p39 - ii. #al8/2 O2 and CO2 transport#
    - p2-2019.pdf - p40 - d. mutation HB #al8/2 O2 and CO2 transport#
- S19-21 p2-2019.pdf - p28 - 5

- p2-2019.pdf - p28 - a. **closed **and **double** circulation system #al8/1.1 circulation system#

- p2-2019.pdf - p28 - b. **recognize the structure in diagraph #al8/3.1 heart structure an function#

  - pulmonary vein ;
    semi-lunar / AW, valve ; **A** pulmonary valve **R** aortic valve
    right, atrium / auricle ;

- p2-2019.pdf - p29 - c. #al8/3.2 cardiac cycle#

  - Explain how the contractions of the chambers of the heart are coordinated during one cardiac cycle.

  - *any four from:*

    1 impulse / wave of excitation / AW, passes from SAN to atria (muscles) ;
    R nervous impulse / signal *once only*
    2 atria both contract, together / at the same time ;
    A atrial systole *if not contradicted by one contracting before the other*
    3 atria contract before ventricles ;
    4 fibrous / non-conducting, tissue prevents impulse travelling to ventricles ;
    5 impulse delayed at AVN ;
    6 AVN passes impulse to, bundle of His / Purkyne fibres ;
    7 Purkyne fibres conduct impulses to muscle in wall of ventricles ;
    8 ventricles contract together (if mp2 not awarded) ;
    A ventricular systole if not contradicted as for atria
    9 ventricles contract from the bottom upwards ;

- M19-22 2 p2-2019.pdf - p4 - b, carbonic anhydrase #al8/2 O2 and CO2 transport#

  - carbon dioxide / CO_2 + water / H_2O ; body tissues → carbonic acid / H_2CO_3 ; lungs ←

- M19-22 p2-2019.pdf - p10 - 4

  - p2-2019.pdf - p10 - a. the thickness of heart wall #al8/3.1 heart structure and function#

- W20-22 p2-2020.pdf - p96 - 6

  - p2-2020.pdf - p96 - a. bohr effect, the effects on CO2. #al8/2 O2 and CO2 transport#

    -

原文链接：p2 questions

max 2 if concept of more not mentioned in response
*any **three** from:*

1 actively respiring tissue means more carbon dioxide ;

2 increase in, formation of carbonic acid / dissociation of carbonic acid / hydrogen ions, (in the red blood cell) ; **A** from equation

3 more hydrogen ions, bind to haemoglobin / form haemoglobinic acid ;
A HHb

4 (causes) more oxygen (to be), unloaded / dissociated / AW (from haemoglobin);
I *ref. to* faster / quicker
I incorrect *ref. to* affinity causing unloading, e.g. CO_2
A lower (percentage) saturation of haemoglobin with oxygen
A oxygen released, more easily / readily from haemoglobin

5 haemoglobin affinity for oxygen decreases ;

6 more oxygen to meet demand for (aerobic / cellular) respiration ; AW
I more oxygen for respiring tissues

- p2-2020.pdf - p97 - b. *** transport, CO2 and HCO3- #al8/2 O2 and CO2 transport#
  - CO_2 = (passive / simple) diffusion ;
    HCO_3^- = facilitated diffusion ;

    I *ref. to* size
    CO_2 is, non-polar / not charged / not ionic and can cross, hydrophobic core / phospholipid bilayer ;
    HCO_3^- is, charged / ionic / hydrophilic and (needs to) cross, via, transport / carrier, protein ; **A** channel protein

    if explanation mps not gained, allow 1 mark for CO_2 is, non-polar / not charged / not ionic and HCO_3^- is, charged / ionic / hydrophilic

- S20-23 p2-2020.pdf - p54 - 3
  - p2-2020.pdf - p54 - a. identify blood vessel and give the reasons #al8/1.2 blood vessels#
    -

any two from
cross section not regular / no defined shape / AW ; **A** not circular
tunica intima smooth; **A** inner layer *for tunica intima* **A** not, crinkly / wavy
thin / thinner (than **X**) tunica media ; **A** thin middle layer
wide lumen diameter relative to wall thickness / relatively large lumen / AW ;
tunica, externa / adventitia, as thick / thicker, than tunica media ;

- p2-2020.pdf - p55 - b. #al8/1.6 blood, tissue fluid and lymph#
3(b)(i)	*any two from* tissue fluid and blood plasma do not have red blood cells ; **A** blood contains red blood cells red blood cells are too large to pass through endothelial pores ; *idea of* tissue fluid and blood plasma similar viscosity / blood more viscous ; AVP ; *ref. to* similar colour (versus blood is red)
3(b)(ii)	*any one from* taken up by / transported into / AW, (body) cells (from tissue fluid) ; used by (body) cells to, synthesise polypeptides / proteins / enzymes ;

- S20-22 p2-2020.pdf - p36 - 2,**** #al8/3.2 cardiac cycle#
  - a. atrial systole
    - sinoatrial node / SAN, sends out, wave of excitation / impulses / electrical impulses ; R nerve impulses
      wave of excitation / AW, spreads across atrial wall ;
  - b. AVN
    - *any two from*
      non-conducting fibres between atrial and ventricle walls ;
      impulse must pass down septum ;
      AVN (in interatrial septum) delays impulse ;
      (gives) time for atria to, complete contraction / empty ;
  - c. blood pressure chart
    - one mark if **F** and **G** are semilunar and **E** and **H** are bicuspid ;
      one mark for **E** and **G** opens ;
      one mark for **F** and **H** closes ;

E *bicuspid / (left) atrioventricular, valve,*	*closes*
F *semilunar / aortic, valve*	*opens*
G *semilunar / aortic, valve*	*closes*
H *bicuspid / (left) atrioventricular, valve*	*opens*

      (during contraction) left ventricle, generates / AW, higher pressure (than left atrium) ;
      A do not produce the same pressure when contracting
      any one from
      (because) wall of left ventricle thicker / more (cardiac) muscle, so reaches higher ;
      data from Fig. 2.1 to show difference in pressure ;

- s20-22 6(p2-2020.pdf - p47 - c), compare the blood cells #al8/1.5 blood cells#
  - *any three from*
    blood smear differences
    large / larger, numbers of lymphocytes ;
    more lymphocytes than normal blood smear ;

    as blood smear or lymphocyte difference
    immature / not fully developed ;
    ref. to no large nuclei / nuclei not pronounced small nuclei ; **A** nuclei not visible

    lymphocyte difference
    non-functional / AW ;
    detail of lack of function for either B-lymphocytes or T-lymphocytes ;

    AVP ; e.g. *ref. to* difficult to distinguish between lymphocytes and monocytes ; **A** no monocytes visible

- W21-23 p2-2021.pdf - p103 - 3
  - a. p2-2021.pdf - p103 - i. *** tricky, identify red blood cell #al8/1.5 blood cells#
    - *any **three** from:*

      1 no, nucleus / organelles ; **ora** e.g. 'if they were white blood cells …'

      2 cytoplasm is, homogeneous / AW ;

      3 about same, size / width / diameter, as lumen of capillary ;

      4 cells about 7 µm in diameter / AW ;

      5 flexible / variety of shapes / irregular shapes ;

      6 AVP ; e.g. rouleau

  - a. p2-2021.pdf - p103 - ii.** tissue fluid vs blood plasma #al8/1.6 blood, tissue fluid and ymph#
    -

*any **two** from:*

1 no red blood cells ;

2 no platelets ;

3 fewer (named) protein(s) / no large proteins / no plasma proteins ;
A no named plasma proteins (albumen / fibrinogen)
A fewer plasma proteins only if stated that they are, small / leave blood

4 less, glucose / amino acids / fatty acids ;

5 fewer, white blood cells / leucocytes / neutrophils / monocytes ;
A more macrophages

6 less / lower concentration of, oxygen
or
more / higher concentration of, carbon dioxide ;

I urea except in liver and muscle tissue
R 'waste'

- b. p2-2021.pdf - p104 - i. o2 dissociation curve #al8/2 O2 and CO2 transport#
  - *ignore any explanations*

    (mean) percentage saturation of haemoglobin with oxygen (in blood leaving the lungs) decreases ;

    (mean) haemoglobin concentration in blood increases ;

    any suitable comparative data quote with altitude in m and mean Hb concentration in g 100 cm^{-3} ***or*** percentage saturation ;

- b. p2-2021.pdf - p105 - ii. high altitude #al8/2 O2 and CO2 transport#
  -

原文链接：p2 questions

*any **three** from:*

1 more red blood cells ;

2 larger red blood cells ;

3 more haemoglobin per red blood cell ;

4 more alveoli / larger surface area for gas exchange ;
A bigger lungs / larger chest volume / broader chest / larger capacity of lungs (total or vital)

5 higher, cardiac output / stroke volume / AW ;
A higher blood pressure in pulmonary artery

6 AVP ;

7 AVP ;
e.g. higher tidal volume / deeper breaths
higher ventilation rate (minute volume) **I** faster breathing
ref. to erythropoietin / EPO, stimulating production of (more) red blood cells
more red blood cells through alveolar capillaries per unit time

- w21-22 p2-2021.pdf - p84 - 2
  - p2-2021.pdf - p84 - a. red blood cells do not leave capillary #al8/1.6 blood, tissue fluid a d lymph#
    - too large / large size ; **A** not small enough

      cannot pass through endothelial, pores / gaps **I** holes
      A fenestrations / AW
      or
      cannot, pass across / cross the membranes of, endothelial cells ;
      A epithelial cells
      in context of entering an endothelial cell and exiting to the tissue fluid
  - p2-2021.pdf - p85 - c. high altitude #al8/2 O2 and CO2 transport#
    -

accept Hb / hb for haemoglobin

*any **three** from:*

1 (at altitude) lower, partial pressure of oxygen / pO_2 (in, atmosphere / inhaled air / inspired air / alveolar air) ;
I low pO_2 in blood
R if stated as high $ppCO_2$ and low pp O_2
R low, volume / saturation, of oxygen

2 percentage saturation of haemoglobin (with oxygen), lower / decreased ;
A haemoglobin is less saturated
A fewer molecules of / less, oxygen, combine / associate, with haemoglobin **I** absorbed / taken up by
R if in context of Bohr effect but then allow ecf for overall **max 2**

3 (as) haemoglobin has lower affinity for oxygen (than at sea level) ;

4 more haemoglobin (synthesised / required / provided) ;

5 compensation / described ;
e.g. helps to transport the same quantity of oxygen as at sea level

6 AVP ; e.g.
idea of more rbc through pulmonary capillaries per unit time

ref. to EPO / erythropoietin (secreted to increase red blood cell production)

- p2-2021.pdf - p85 - d. oedema, osmosis #al8/1.6 blood, tissue fluid and lymph#
  - *any **three** from:*
    A Ψ for water potential **A** plasma for blood

    mp1 and mp2 = consequence in blood of lower blood albumin than normal
    1 *idea that* low blood albumin means, less / AW, solute ;
    2 (so) higher water potential (in blood); *must be in context of blood context can be anywhere along the capillary*
    A high water potential *if ref. to low albumin is made*
    A steeper water potential gradient (than normally, at arterial end)

    mp3 and mp4 = return of water to blood from tissue fluid (capillary venous end)
    3 less steep water potential gradient (than normal) / little difference in water potentials ;
    4 less / little, water returns to, blood / capillary (from tissue fluid) ;
    A (tissue) fluid *for water*
    R plasma *for water*

    additional ideas
    5 *idea that* more, water / plasma / fluid, enters tissue fluid (than normal)
    R tissue fluid *for fluid*
    A more, water / fluid, enters tissue fluid than exits (to the capillary or lymph system) ; *(compared to normal)*

    6 AVP ; e.g. water can enter tissue fluid for a longer time than normal
    less albumin than normal to act as an osmotic force for return of water / AW
    too much excess, water / fluid / tissue fluid, to be taken up into lymph, capillaries / vessels / system

- S21-23 p2-2021.pdf - p58 - 5
  - p2-2021.pdf - p58 - a, identify the cells #al8/1.5 blood cells#
    -

allow one mark if monocyte and neutrophil both labelled as phagocytes and no other cell is labelled phagocyte

allow phagocyte for either the monocyte or neutrophil if the other cell correct

red blood cell / erythrocyte ;

monocyte / macrophage;
I white blood cell
I leucocyte

neutrophil ;
A *polymorphonuclear leucocyte / basophil / eosinophil*

lymphocyte ;
I B / T
I B-cell / T-cell

- p2-2021.pdf - p59 - b. cardiac cycle graph #al8/3.2 cardiac cycle#
- p2-2021.pdf - p60 - (c) .COPD gas exchange, 不考了

- S21-22 p2-2021.pdf - p37 - 3,
  - p2-2021.pdf - p37 - a. blood and tissue fluid #al8/1.6 blood, tissue fluid and lymph#
    - *accept from either column for mark and assume blood if not stated*
      any three from

blood	**tissue fluid**	
has red blood cells	has no red blood cells	;
more, white blood cells / leucocytes / named e.g. neutrophils, lymphocytes, monocytes **or** fewer macrophages	fewer white blood cells / leucocytes / named e.g. neutrophils, lymphocytes, monocytes **or** more macrophages	;
has platelets	has no platelets	;
has, more protein / large proteins **or** has, plasma proteins / named example e.g albumin / fibrinogen / globulin *these are large proteins*	has, fewer / no large, proteins **or** has no, plasma proteins / named example e.g. albumin / fibrinogen / globulin *only allow fewer plasma proteins if clear the proteins present are small enough to leave blood*	;
higher, concentration / AW, oxygen **A** more oxygenated	lower, concentration / AW, oxygen **A** less oxygenated	;
higher, concentration / AW, glucose / amino acids / fatty acids	lower, concentration / AW, glucose / amino acids / fatty acids	;
lower, concentration / AW, carbon dioxide **A** urea, in liver / muscles **I** waste	higher, concentration / AW, carbon dioxide **A** urea, in liver / muscles **I** waste	;
higher pressure	lower pressure	;

- S21-22 4 p2-2021.pdf - p42 - (e) * #al8/2 O2 and CO2 transport#
  -

any two from

1 only oxygenated blood passes through left side of heart **ora**
or
oxygenated blood in left side and deoxygenated blood in right side of heart ;

2 septum in heart separates (oxygenated and deoxygenated) blood ;

3 oxygenated blood is in pulmonary, venules / veins and deoxygenated blood is in, pulmonary arteries / arterioles ;

4 (because mixing prevented by) double circulation / double circulatory system / pulmonary and systemic circulations ;

-

Chapter 9. Gas exchange

- S18-23 4 p2-2018.pdf - p58 - (a) ** Outline how oxygen enters the blood stream from an a veolus. #al9/1.7. gas exchange process#

  - *answers must be in context of oxygen*

    three from:

    1 diffusion
    2 movement, down a, concentration / diffusion, gradient / from high(er) to low(er) concentration ;
    A in terms of partial pressure
    3 passive (process) ;
    4 through alveolar wall / across alveolar cells / across squamous epithelial cells (of alveolus) / across pavement cells (of alveolus) ;
    A squamous cells
    5 across, endothelium / endothelial cells / capillary wall ;
    A squamous, epithelium / cells (in context of capillary wall)
    6 ref. to diffusion / AW, through the phospholipid bilayer of cell surface membranes / between the phospholipids of the bilayer (of squamous or endothelial cells) ;

- S18-22 p2-2018.pdf - p43 - 5a. ***Describe the gross structure of the human gas exchang system #al9/1.1.the structure of gas exchange#

  - *three from:*

    any four named structures ;
    mouth / nose / nostrils / nasal passages (count as one structure)
    pharynx
    larynx
    trachea **A** windpipe
    bronchus / bronchi
    bronchiole / bronchioles
    alveolus / alveoli / alveolar ducts / alveolar sacs
    lungs

    trachea, branches / divides, into (two main) bronchi ;

    correct sequence from bronchus (branching) to bronchioles to (end with) alveoli ;

    further detail ; ; e.g. trachea has, C-shaped / incomplete rings, of cartilage bronchus has cartilage, plates / AW
    diameters of gas exchange structures / respiratory tubes, decrease (towards alveoli)

- M18-22 2 p2-2018.pdf - p5 - b prevent pathogens from entering cells #al9/1.5.CGM#

  -

*any **three** from:*

1 production of mucus by, mucous glands / goblet cells ;
2 sticky / AW, mucus
or
mucus traps, pathogens / bacteria / microorganisms ;
3 mucus acts as a barrier (to prevent entry) ;
4 mucus increases distance to reach cells ;
5 cilia on ciliated epithelial cells ;
A ciliated epithelium
6 cilia, waft / move, mucus / AW ;
7 *idea that* (contaminated) mucus is moved, away from alveoli / away from lung tissue / towards back of mouth / AW ;

- S19-23 p2-2019.pdf - p52 - 2
  - p2-2019.pdf - p53 - b. the structure of alveoli #al9/1.1.the structure of gas exchange#
    - *any **three** from:*

      1 production of mucus by, mucous glands / goblet cells ;
      2 sticky / AW, mucus
      or
      mucus traps, pathogens / bacteria / microorganisms ;
      3 mucus acts as a barrier (to prevent entry) ;
      4 mucus increases distance to reach cells ;
      5 cilia on ciliated epithelial cells ;
      A ciliated epithelium
      6 cilia, waft / move, mucus / AW ;
      7 *idea that* (contaminated) mucus is moved, away from alveoli / away from lung tissue / towards back of mouth / AW ;

- W20-23 p2-2020.pdf - p102 - 1
  - p2-2020.pdf - p102 - a. identify the structures #al9/1.1.the structure of gas exchange#
- W20-22 p2-2020.pdf - p88 - 3
  - p2-2020.pdf - p88 - a. identify bronchus #al9/1.3.microscopy# #al9/1.1.the structure of as exchange#
    - irregular / plates / AW, of cartilage ; **A** cartilage not C-shaped rings

      other features
      *any **two** from:*
      smooth muscle ;
      elastic, tissue / fibres ;
      mucous glands ;
      thick wall / wall many layers ;
      large lumen (relative to thickness of wall) ;
      large size relative to surrounding alveoli ; **I** surrounded by alveoli
  - p2-2020.pdf - p89 - b. identify blood vessels #al8/1.2 blood vessels#
    -

evidence must match stated structure

blood vessel ;
*plus any **one** from:*
presence of tunica media / circular layers of smooth muscle ;
three layers in wall ;
similar to structure on left, which has blood cells ;
not bronchiole, qualified ; e.g. as no ciliated epithelium
not rounded shape / no definite shape
OR
artery ; **A** arteriole
*plus any **one** from:*
small lumen relative to thickness of wall ; **A** small lumen with thick wall
thick, tunica media / muscle layer ;
thick tunica externa ;
OR
vein ;
*plus any **one** from:*
no definite shape / not rounded / not oval / AW ;
large lumen relative to thickness of wall / large lumen and thin wall ;
thin tunica media ;

- p2-2020.pdf - p89 - c. how goblet cells and cilia work together to maintain healthy lung t ssue #al9/1.5.CGM#
  - goblet cells, produce / secrete / AW, mucus to trap, pathogens / AW ;
    A dust / dirt / particles etc for AW

    cilia, waft / moves / carries / push, mucus, to back of throat / AW ;

- S20-23 3 p2-2020.pdf - p55 - c. the function of smooth muscle in the gas exchange system #al9/1.1.the structure of gas exchange#
  - *any two from*
    contraction and relaxation ;
    changes diameter of (lumen) of, trachea / bronchus / bronchiole ;
    A (contraction causes) constriction
    control of air flow (in the bronchioles) ;
    AVP ; e.g. changed size of lumen during coughing / forced air out

- S20-22 p2-2020.pdf - p40 - 4
  - p2-2020.pdf - p40 - bi. distribution of cartilage #al9/1.1.the structure of gas exchange#
    -

any two from
in trachea ;
in, bronchus / bronchi ;
if only one correct structure named, allow one qualification mark
trachea
C-shaped / incomplete, rings ;
surround smooth muscle ;
bronchus
plates / irregular ;

- p2-2020.pdf - p40 - bii. function of cartilage #al9/1.1.the structure of gas exchange#
  - *any two from*
    keep airways open ;
    provides support ;
    allow flexibility ; *allow described e.g. bending neck, swallowing food*
    rings allow, lengthening / widening, during, breathing in / inspiration / inhalation ;

- W21-23 6 p2-2021.pdf - p111 - (c) the function of elastic fibres #al9/1.1.the structure of g s exchange#
  - *any **two** from:*
    either
    1 allow alveoli, to stretch and recoil (during inhalation and exhalation)
    or
    allow, lung (tissue) / named airway, to expand and recoil ;
    I 'contract', 'relax' and 'gas exchange' / 'respiration'

    2 prevent alveoli, over-stretching / bursting ;

    3 recoils to move air out of alveoli ;
    A force / expel / push / AW
    A alveolar duct

- S21-23 5 p2-2021.pdf - p60 - (c) COPD 不考

Chapter 10. infectious disease

- W18-23 p2-2018.pdf - p112 - 5
  - p2-2018.pdf - p112 - a.i. name of the bacterium that causes TB #al10/1.1.infectious dise se#
  - p2-2018.pdf - p112 - a.ii. Suggest and explain how the effect of phagocytes on tissues in the lungs leads to people feeling tired all the time #al10/1.1.infectious disease#
    -

5(a)(i)	Morbillivirus ;
5(a)(ii)	*any **three** from:* 1 (pathogen is transmitted) in airborne droplets / as an aerosol ; **A** droplet infection / aerosol infection 2 breathed / sneezed / coughed / AW, out by infected person ; 3 (droplets) breathed in by, healthy / uninfected, person ; 4 touching surface with virus and, breathing into lungs / puts fingers in, nose / mouth ;

- p2-2018.pdf - p112 - b. control TB #al10/1.4.control transmission#
  - *ignore* mutation and vaccine evasion / vaccine resistance
    ignore refs to cost

    *any **four** from:*

    transmission and susceptibility (from mp1 to mp7)
    1 infected person can infect many people / spreads easily in crowded conditions ;
    2 measles spreads to children before they are vaccinated ;
    3 vaccine cannot be given soon after birth because of passive immunity ;
    4 immunisation rates do not reach 100% / ref to difficulty in reaching herd immunity / herd immunity is not achieved ;
    5 herd immunity needed for protection of, unvaccinated people / babies ;
    6 some people have, no / poor, response to vaccine ;
    A vaccine not always effective

    7 *ref. to* malnutrition / *ref. to* lack of vitamin A ;

    reasons for low immunisation rates (from mp8 to mp12)
    8 difficult to reach all people, with example ;
    e.g. in rural areas
    areas of poor housing in big cities

    9 collapse of vaccination programmes as a result of war / AW ;

    10 lack of, trained professionals / health facilities ;

    11 many children do not receive boosters ;

    12 reluctance to be vaccinated / *ref. to* anti-vaccination campaigns / ref to MMR *or* triple vaccine / lack of awareness about beneficial effects of vaccine / *ref. to* cultural *or* religious reasons / AW ;

    13 AVP ; *(for either section of the answer)*
    e.g. *ref. to* any specific difficulty with contact tracing
    ref. to thermostability of vaccine and maintaining a cold chain
    migrants, with measles / from an area with an outbreak of measles

- W18-22 p2-2018.pdf - p92 - 4
  - b. p2-2018.pdf - p93 - i. work on the figure
  - b. p2-2018.pdf - p94 - iii. ART and HIV #al10/1.1.infectious disease#
    -

原文链接：p2 questions

in context of pregnant and breastfeeding women who are living with HIV
any three from

1 *ref. to* mother to child transmission ; *in context of HIV transmission*
A (because) HIV can be passed from mother to baby
A decreases HIV transmission during, pregnancy / labour / birth / breastfeeding
A reduces, number / proportion, of babies born with HIV (so fewer die)
I stops transmission *(as this is in context of global transmission this implies in all cases)*
I makes babies immune to HIV / AW or gives passive immunity
allow idea that ART may be passed across, placenta / breastmilk, to baby and so provide(short-term) protection against any HIV transmitted from mother

2 reduces number of, HIV positive women becoming ill (with HIV/AIDS) /women with HIV/AIDS dying from the disease ;
A opportunistic infections / named examples e.g. TB

3 example of reduces spread of HIV ;
in any correct context other than HIV mother to child
e.g. child may grow up without HIV and will not pass on
mother less likely to pass on to partner

4, 5 examples of, social / economic, effect ;;
e.g. (healthy women) can contribute to work force
can be main carer if partner has died (*idea that* children not orphaned)
overall financial savings
e.g. if infants are not born with HIV then no lifelong ART required
ART may be less costly than treating HIV/AIDS
makes breastfeeding safer when no other options exist to feed babies
HIV negative children will become next workforce generation
all women throughout world receive same treatment

- p2-2018.pdf - p96 - (c). monoclonal antibody production #al11/2.2.monoclonal antibod #

4(c)(i)	(HIV) antigen / p24 ; **A** capsid protein / capsomere(s) / protein coat **R** HIV
4(c)(ii)	(time needed) so, immune response / clonal expansion / production of B-lymphocytes / production of plasma cells, can occur ; **A** B-cells / splenocytes **R** plasma cells need to multiply **I** *ref. to* antibody production

4(c)(iii)	*any one from* immortal / long-lived ; able to replicate / capable of cell division ; uncontrolled cell division, can grow / survive, in cell culture ; cannot grow on, HAT / hypoxanthine-aminopterin-thymidine / step **4**, (culture) medium ; **A** do not have gene coding for ability to grow on HAT	**1**
4(c)(iv)	hybridoma ;	**1**
4(c)(v)	*any one from* (check cells for) production / AW, (by hybridoma cells) of, anti-HIVp24 antibody / antibody against p24 ; **A** the antibody / monoclonal antibody **A** check cells, contain / have / AW, desired antibody / AW *idea that* only want cells that produce desired antibody / do not want cells that produce different antibodies / need to remove cells that don't produce the antibody ; waste of, money / resources, to culture other cells / if no antibody produced ;	**1**

- S18-23 3 p2-2018.pdf - p56 - (e) monoclonal antibody
- e. p2-2018.pdf - p56 - i. primary response, antibody production #al11/2.2.monoclonal ntibody#

accept cell for lymphocyte throughout

four from:

1 (primary) immune response ;
2 cyFBPase / enzyme, is antigen ;
3 formation of, APC / antigen-presenting cell ;
A antigens presented on surface of macrophages
4 antigen, recognition / binding (in context of B-, or T-lymphocytes) ;
5 detail ;
e.g. clonal selection
have receptors, complementary / specific, to, antigen / cyFBPase
A immunoglobulin / antibody, as receptors for B-lymphocytes
A surface molecules as receptors for T-lymphocytes
6 divide by mitosis / clonal expansion ;
7 (specific) B-lymphocytes form plasma cells ;
8 plasma cells, synthesise / secrete, specific antibody / antibody to cyFBPase ;
9 T-helper / Th, lymphocyte, secretes, cytokine / interleukin ;
10 stimulates, humoral / B-lymphocyte, response ;

- e. p2-2018.pdf - p57 - ii. test antibody #al11/2.2.monoclonal antibody#
  - no binding of (monoclonal) antibody to, antigen / cyFBPase / enzyme / AW ;

- S18-23 p2-2018.pdf - p64 - 6a. the feature of disease #al10/1.1.infectious disease#
  - **A** HIV / AIDS, measles, smallpox ;
    B cholera, tuberculosis ;
    C cholera ;
    D malaria ;

- S18-22 3 p2-2018.pdf - p39 - (a). how does penicillin works #al10/2.1.penicillin#
  -

A antibiotic for penicillin throughout

three from:

1 (penicillin) weakens / AW, the cell wall ;
I punches holes / holes made

2 (penicillin) acts, on growing cells / when cell wall being synthesised (during growth) ;

3 inhibits / binds to / AW, enzymes / transpeptidases (for cross linkage formation) ;
I ref. to synthesis of peptidoglycan

4 prevents formation of cross, links / linkages (between, peptidoglycan / murein, molecules) / AW ;

suggestions why antibiotic is less effective on Gram negative

5 outer membrane, prevents / interferes with / protects from / AW, entry (of penicillin) ;
A idea of, more difficult / further, to reach peptidoglycan layer

6 proteins in outer membrane may pump out antibiotic ;
A presence of efflux pumps

7 enzymes may be present (in periplasm) to degrade antibiotic / AW ;

8 suggestion that antibiotic cannot cross hydrophobic region of (outer) membrane ;

9 AVP ; e.g. proportionately, less / lower concentration of, penicillin reaches murein for, enzyme / transpeptidase, inhibition

- M18-22 2 p2-2018.pdf - p5 - c. the spread of TB in body #al10/1.3.transmission of disease#
  - *any **one** suggestion from:*

    blood / plasma / circulatory system ;
    lymph / lymph system ;
    within, neutrophils / macrophages / phagocytes ;
    A white blood cells / leucocytes

- w19-22 p2-2019.pdf - p91 - 5 *** malaria
  - p2-2019.pdf - p91 - a. Outline how penicillin acts on bacterial cells. #al10/2.1.penicillin#
    -

1 prevents formation of, cross links / cross linkages (between, peptidoglycan / murein, chains) ;
A peptide cross links
A links between, murein / polymer, chains
I peptide bonds
I formation of peptidoglycan
R if cellulose chains stated

2 (penicillin) inhibits, transpeptidase action / enzyme involved in forming cross links ;
A alternative correct names for transpeptidase

3 weakens cell wall ;
A cell wall unable to withstand (turgor) pressure
A cell wall loses strength
R idea that penicillin, punches / makes, holes, to weaken

4 (cell), lysis / bursts / ruptures / AW (so bacterium killed) ;

5 acts, on growing bacteria / when bacteria are increasing in size (when cell wall needs to be synthesised) ;
I growing, wall / peptidoglycan chains

- p2-2019.pdf - p91 - b. the pathogen of malaria #al10/1.1.infectious disease#
  - *(Plasmodium / P.), ovale / falciparum / malariae / vivax ; correct spelling*

    I *if Plasmodium is written after the species name*
    if more than one given, all must be correct

- p2-2019.pdf - p91 - c. the mosquito is the vector for malaria #al10/1.3.transmission of di ease#
  -

any one valid suggestion:

male does not, need protein for egg production / produce eggs ;
R larvae
I male does not reproduce

male does not have mouthparts for piercing skin ; AW
e.g. no 'needle' to pierce skin (to suck blood)

adult male does not feed ;
adult male feeds (only) on, plants / nectar ;
blood is toxic to males ;
can't detect presence of, humans / mammals ;
male does not produce anticoagulant (for blood) ;

- p2-2019.pdf - p92 - d. control malaria #al10/1.4.control transmission#
  -

accept mosquito or vector for Anopheles
accept, pathogen / parasite, for Plasmodium

max 2
1 *idea that* individuals / people, taking antibiotics for bacterial diseases will pass on antibiotics to *Anopheles* when it feeds ;
e.g. blood taken by *Anopheles* contains antibiotics

2 (so) antibiotics kill bacteria (in *Anopheles* gut) ;
must be in context of gut bacteria

3 decreased / no, competition between, *Plasmodium* and (gut) bacteria (so more *Plasmodium* survives) ;

4 higher survival of *Plasmodium* makes effective (*Anopheles*) immune response more difficult ; AW
(so Anopheles more likely to pass on Plasmodium)

max 2
I ref. to antibiotic resistance

5 use of antibiotics may increase, incidence / number of cases of, malaria ;

6 and **7** *two marks for* examples of what doctors need to consider ;
e.g. need to balance antibiotic intake with increased risk of malaria transmission
idea that do not want to stop people taking antibiotics / antibiotics needed to fight (bacterial) infections
treat for malaria before giving antibiotics for (non-serious / non-life threatening) bacterial infections
only prescribe antibiotics that have, no / low, impact on bacteria in *Anopheles* (gut)
(consider) avoiding use of antibiotics to treat malaria

8 AVP ;
e.g. need to research which antibiotics have this effect look for alternatives to antibiotics to treat bacterial infections

- p2-2019.pdf - p93 - e. malaria vaccine #al10/1.1.infectious disease#
-

any four from:

1 (*Plasmodium*) is a, eukaryote / protoctist, so has many antigens ;
R bacterium / virus, is a eukaryote
or (*Plasmodium*) has many genes coding for (different) antigens ;
I antigenic variation

2 *idea that* different *Plasmodium* species have different antigens ;
I antigenic variation
I strains *for species*

3 (*Plasmodium*) has different stages of life cycle (within human) with differer antigens / shows antigenic variation ;

4 antigenic concealment / *Plasmodium* spends part of life cycle within host cells / AW ;
A short time in blood plasma
A spends time inside, red blood cells / liver cells

5 need to find the antigens that give the strongest immune response ;

6 need to, develop / use, more than one type of vaccine ;
A cannot use only one type of vaccine

7 AVP ;
e.g. mutations will give changed antigens
need to find antigens present in, all / most, stages of life cycle

difficulties in producing a generic vaccine max 2

8 costly to produce / need to keep costs low / developing countries need to be able to afford vaccine ;

9 needs to have a long shelf life / be stable / be easily stored (e.g. without cold storage) / AW ;

10 (immunity) needs to be long-lasting / aim to avoid boosters / need to develop a single dose vaccine ; AW

● S19-23 3 p2-2019.pdf - p56 - b. ***control the spread of cholera #al10/1.4.control transmi sion#

-

I better sanitation unqualified
I *ref. to* unclean water

any five from :

ref. to treat drinking water ;
A clean / sterilised / chlorinated / safe / bottled / boiled
A *ref. to* water treatment plants
provide sewage treatment plants ; **A** treat waste water / containment of sewage / provide latrines (in temporary camps) ;
ref. to keeping sewage and (drinking) water sources separate ;
A examples e.g. avoid swimming downstream of sewage outlets
avoid defaecating near rivers used for washing
water treatment plants upstream of sewage disposal
bury faeces

ref. to vaccination / providing vaccines ;

ref. to education in ways to prevent spread ;

ref. to (encourage) hand washing ;

ref. to food hygiene ; e.g. use of clean cooking utensils / covering food to prevent flies landing / washing food in treated water / cook food thoroughly / peel fruit and vegetable washed in (suspected) contaminated water

discourage use of human faeces for fertiliser / use fertiliser other than human faeces / do not irrigate plant food with contaminated water;
control breeding of, vectors / flies ;

rapid diagnosis ;
rapid treatment (for earlier recovery to minimise risk of spreading) ;
ref. to oral rehydration, salts / therapy ;
use of antibiotics ;
ref. to isolation / quarantine ;

- S19-22 p2-2019.pdf - p41 - 4
  - p2-2019.pdf - p41 - a. the structure of V. cholerae #al10/1.1.infectious disease#
    - *max 3* if any membrane-bound organelles drawn inside cell e.g. nucleus, Golgi body, mitochondrion, lysosome, ER, a large vacuole
      BUT **I** vesicle / small vacuoles

      I detail of cell wall / cell surface membrane around flagellar area

      four from:
      cell wall ; *must add another line to diagram* **R** cellulose cell wall

      cell (surface) membrane ; **A** plasma membrane
      label line to the inside of cell wall
      I if outer line labelled as cell membrane

      DNA ; **A** bacterial chromosome / nucleoid *as label*
      allow one or two circular molecules (circle, loop, ball of string, tangled)
      R *if obviously linear*
      R if label includes, histones / histone proteins / chromatin
      R if nuclear, envelope / membrane, shown
      R if nucleolus shown or labelled

      ribosomes ; **R** 80S ribosomes
      shown as, dots / small spheres
      cytoplasm / cytosol ;

      plasmid ; *smaller than DNA, circular*

      AVP ; e.g. 70S / smaller / 17–20 nm, *for ribosome*
      murein / peptidoglycan (for cell wall – allow even if cell wall label not added)
      pilus /pili *drawn as external hair-like structure(s)*
      basal granule *at base of flagellum*
      capsule drawn to outside *(some do have a capsule)*

- p2-2019.pdf - p42 - b. ***explain the fatality rate of cholera #al10/1.1.infectious disease#
  - 4(b)(i) | 0.8 % ; **R** 0.80 %
  - 4(b)(ii) | *any two from:*

    delay in / no, diagnosis ;
    delay in / no, treatment / therapy ;
    A feature of, oral rehydration, treatment /solution **A** ORT / ORS
    e.g. lack of supply of ORT
    unwillingness by health workers to give ORT
    greater belief in herbal remedies
    thinking drug treatment is sufficient
    lack of clean water to make up ORT solution
    no rehydration programmes
    I improper treatment / treatment not effective
    ref. to no / lack of, antibiotic therapy ; e.g. lack of supply of / less efficacious (AW) antibiotics used / less supervision in taking full dose
    ref. to antibiotic resistant strains ;
    idea that already have a weak immune system / malnourished ;
    A may have HIV/AIDS (hence weak immune system)

- p2-2019.pdf - p42 - c. ***the control of cholera #al10/1.4.control transmission#
  - 4(c)(i) | *any one from:*

    damaged sanitation system / poor sanitation following earthquake ;
    I poor sanitation unqualified

    damage to, sewage treatment plants / water purification plants ; AW

    (contaminated) sewage contaminates drinking water ; **I** pollution
    A water becomes contaminated

    lack of purified drinking water; **A** lack of, clean / treated / safe / bottled, water

    AVP ; no, proper / safe, disposal of sewage

  - 4(c)(ii) | *any three from:*

    1 2011, peak in / highest / AW, number of, cases / countries / countries and cases ;
    A decrease, increase in 2011, decrease *for countries*
    A increase to 2011 and decrease *for cases*

    2 (2010 outbreak in) *ref. to* Haiti and epidemic (so high number of 2011 cases) ;
    3 *ref. to* spread of disease to countries neighbouring Haiti (hence increase in countries in 2011) ;
    4 overall / generally / AW, decrease in number of countries with cases of cholera
    or
    2008 54–56 countries and 2015 41–43 countries, with ref. to decrease ;
    decrease, peak at 2011 / increase in 2011, decrease is mp1 only
    5 suggestion for trend in decrease in number of countries ;
    e.g. improved infrastructure for sewage / water treatment
    improved health education to prevent spread
    providing piped (treated) water
    6 2008–2010 number of cases increased and number of countries decreased ;
    7 AVP ; e.g. lowest / AW, number of cases in 2013
    R if also state that 2013 is lowest for countries
    similar number of countries in 2008 and 2011 but, approx 3× / much higher / stated values, number of cases in 2011

- M19-22 p2-2019.pdf - p6 - 3
  - a p2-2019.pdf - p7 - i. describe the figure
    -

***accept** ora throughout*

*any **four** from:*

(case) incidence:
1 only Lao PDR increase in (case) incidence / AW ;
2 Papua New Guinea has greatest reduction ;
3 numerical data extracted from Fig. 3.1 to support ;

mortality (rate):
4 all countries have a reduction ;
5 Cambodia greatest reduction
A Cambodia **and** Lao PDR
or
Solomon Islands least reduction ;
6 numerical data extracted from Fig. 3.1 to support ;

- a p2-2019.pdf - p7 - ii. role of insecticide-treated nets #al10/1.4.control transmission#
  - *any **two** from:*

    nets prevent entry of, mosquito / *Anopheles* ;
    A in context of covering containers with water
    insecticide, kills / reduces number of, mosquitoes / *Anopheles* ;
    (female) mosquito / *Anopheles*, is vector / transmits parasite / AW ;
    feeds / takes blood meal, (mainly) at night / when people sleeping ;
    (helps to) break the transmission cycle ;

- p2-2019.pdf - p8 - b. disease diagnosis by monoclonal antibody #al11/2.2.monoclonal antibody#
  - 3(b)(i) *any **two** from:*

    1 testing for the presence of different, antigens / (*Plasmodium*) proteins ;
    2 antibodies are, specific / have specific shape ;
    A ref. to complementarity
    3 different monoclonal antibodies have, different, variable regions / antigen binding sites ;
    4 (pLDH / HRP-2 / *Plasmodium*) protein, binds to / complexes with, (monoclonal) antibody ;

  - 3(b)(ii) *any **two** from:*

    (positive result of test strip 1) pLDH present, (so) the person, has malaria / is infected by *Plasmodium* ;
    I species names

    (negative result of test strip 2) HRP-2 not present, (so) the cause of malaria is not / the person is not infected by, *P. falciparum* ;
    (negative result of test strip 2) HRP-2 not present, (so) the person is infected by *Plasmodium* other than *P. falciparum* / AW ;

- W20-23 p2-2020.pdf - p109 - 4
  - p2-2020.pdf - p109 - a. antibiotic efficiency #al10/2.2.antibiotic resistance#
    - **X – R**
      and
      Y – P ;

- a p2-2020.pdf - p110 - ii. the mean that antibody works #al11/1.2. antigen and antibodies#
  - *any **two** from:*

    mp1** = resistance with ref. to **P / Q / R
    Y, is resistant to **Q** / has no resistance to **P** ;
    A Y has some resistance to (antibiotic) **R**

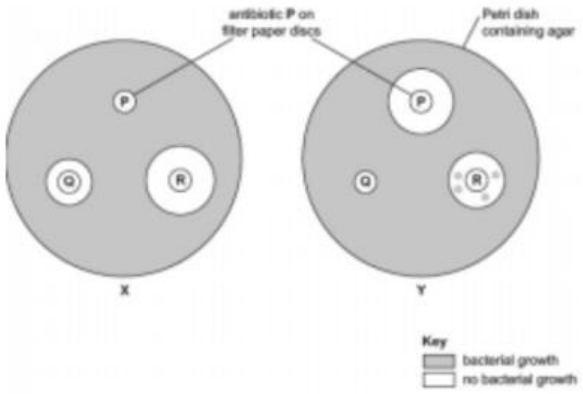
    ***mp2** = antibiotics used at different concentrations*
    (antibiotic) **R** may, have different concentration / be less effective, compared with **P** ;

    ***mp3** = reason for resistance*
    ref. to gene(s) for resistance (on plasmids)
    or
    Y has, cell wall / cell membrane, that prevents entry of antibiotic **Q**
    or
    Y has enzyme that breaks down, **Q / R** ;

    ***mp4** = action of antibiotics*
    idea that antibiotics have, different / specific, target(s) / AW ;

    A any example of process inhibited by antibiotic, e.g.
    cell wall synthesis
    transcription
    translation
    DNA replication
    cell surface membrane function
    synthesis of folic acid

  - ***mp5** = AVP ;*
    e.g. *idea that* **P** may be bacteriocidal / (antibiotic) **R** is bacteriostatic
    e.g. *idea that* gene for resistance to antibiotic **R** passed by, vertical / horizontal, transmission



- p2-2020.pdf - p110 - b. vaccine vs antibiotics #al11/2.4. vaccine and immunity#
  -

*any **three** from:*
*to award the MP1 to MP5 you **must be able to see a difference** between the two stated clearly*

	vaccines		*antibiotics*
1	(generally) are preventative / are not a treatment / are not a cure **or** use before a person, has an infection / is ill	**v**	are (generally) not preventative / are a treatment / are a cure **or** used when a person, has an infection / is ill ;
2	effective against bacteria and viruses (in context of different vaccines)	**v**	not effective against viruses / only effect against bacteria ;
3	*idea of* indirect effect on pathogens	**v**	*idea of* direct effect on pathogens ; **A** example of effect
4	not given as a course / give once or a few times (or with boosters)	**v**	given as a course / over many days / AW ;
5	specific for particular, pathogen	**v**	(most) antibiotics act on a range of pathogens ;
6	stimulate an immune response	**or**	do not stimulate an immune response ;
7	detail e.g. stimulate, (B- / T-) lymphocytes / production of antibodies **A** stimulates production of memory cells	**or**	do not stimulate, (B- / T-) lymphocytes / production of antibodies ; **A** no stimulation of memory cells
8	provide long-term, protection / immunity	**or**	do not provide long-term, protection / immunity ;
9	does not lead to resistance	**or**	may lead to resistance ;
10	time delay before being effective / AW	**or**	have effect, faster / sooner / AW ;

- W20-22 p2-2020.pdf - p84 - 2a
  - p2-2020.pdf - p84 - a. combination treatment to reduce the impact of antibiotic resistance #al10/2.2.antibiotic resistance#
    -

any ***four*** *from:*

1 (in combination treatment) antibiotics (in Table 2.1), act at different targets / have different modes of action / AW ;
A comparison of any two antibiotics from Table 2.1
A suggestion of how two antibiotics have different ways of killing

2 *idea that* if resistance / mutation, occurs / exists, unlikely to be against all antibiotics / other antibiotics should still be effective ;

3 (in combination treatment) if resistance / mutation, occurs / exists, all bacteria will (still) be, killed / destroyed / AW ;
A no bacteria remain to develop resistance / no reservoir of resistant bacteria

4 antibiotic resistance, not / less likely to be, spread to affect people because no bacteria surviving (with combination treatment) ; AW

5 long treatment time / 6 months, with, combination treatment / AW, increases chance of killing all bacteria
or
long treatment time with a single antibiotic not effective in killing all bacteria if, resistance develops / a mutation occurs ;

6 AVP ; e.g.
combination treatment (is likely to) eliminate bacteria more quickly (so less chance of resistance occurring)

resistance to different antibiotics involves more genes so less chance of resistance occurring

gene for antibiotic resistance has more chance of being passed on if using single antibiotic (and not all killed) ora

if using single antibiotic (and not all killed) more chance of being passed on (to other bacteria) by horizontal / vertical / AW, transmission ora

- S20-23 p2-2020.pdf - p52 - 2
  - p2-2020.pdf - p52 - a. insecticide control malaria #al10/1.4.control transmission#
    -

allow mosquito for Anopheles throughout
allow pathogen for Plasmodium throughout

any three from
role of *Anopheles* in transmission cycle ; e.g. *Anopheles* is, a vector of *Plasmodium* / *Anopheles* passes *Plasmodium* from infected person to uninfected person

insecticide on nets and on surfaces
kills *Anopheles* before it can take blood from an infected person ;
kills *Anopheles* before it can transfer blood with *Plasmodium* to uninfected person ;

presence of nets
protect people, when sleeping / at time when *Anopheles* is, active / feeding ;

general
prevent *Plasmodium* from completing its life cycle ; AW

AVP ; *idea of* reducing population size of mosquitoes
use of different insecticides on net and IRS to avoid insecticide resistance

- p2-2020.pdf - p53 - c. secondary response #al11/1.3. immune response#
  - *any three from*
    higher concentration of antibodies ;
    faster production of antibodies ;
    because of presence of memory, B-lymphocytes / B cells ;
    higher numbers of specific B-lymphocytes, so increased chance of faster recognition / because of clonal expansion in first response ;
    AVP ; e.g. also more memory T-cells to stimulate B-lymphocyte response
    ref. to higher concentration antibodies in circulation remaining after recovery

- w21-22 p2-2021.pdf - p86 - 3,
  - p2-2021.pdf - p86 - a. the definition of infectious disease #al10/1.1.infectious disease#
    - *any **two** from:*

      infectious
      (baculovirus) is a pathogen / causative organism (of disease) ;
      (baculovirus) is transmitted (from one insect host to another) / transmissible ;
      allow a description of transmission, e.g. transfer of, virus / pathogen, from, insect to insect / organism to organism
      I spread **R** person to person / plant to plant

      disease
      idea of causing ill-effect on insect, e.g. causes, harm / damage / loss of functioning / ill health / death ; **A** illness

- w21-22. 5 p2-2021.pdf - p90 - (b) , measles 不考了
- S21-23 p2-2021.pdf - p52 - 2
  - p2-2021.pdf - p52 - c. antibiotics can not treat virus #al10/2.1.penicillin#
    -

allow, virus / viruses, for Morbillivirus

I penicillin doesn't act on viruses

any two from

1 penicillin only acts on bacteria (and measles is caused by a virus) ;
A prokaryotes

2 *Morbillivirus* does not have, cell walls / murein / peptidoglycan ;

3 *Morbillivirus* does not have, transpeptidases / the enzyme that is inhibited (by penicillin) ;
A *idea of* not possessing the enzyme that is acted upon by penicillin

4 *Morbillivirus* does not grow / penicillin (only) acts on growing cells / AW ;
A when cell wall is, growing (larger) / getting bigger

5 *Morbillivirus* does not have cellular structure / *Morbillivirus* is acellular / penicillin only acts on cells ;

- p2-2021.pdf - p52 - d. antibiotics for HIV person #al10/2.2.antibiotic resistance#
  - to treat / to cure / may have / prone to / to prevent / AW, infectious diseases / infections / AW ;
    e.g. bacterial / opportunistic / secondary, disease(s) / infection(s) **A** to kill bacterial pathogens
    A to treat (some) fungal diseases
    R viral disease / HIV infection
    do not award if a mix of viral and bacterial diseases stated

Chapter 11. immunity

- W18-22 4 p2-2018.pdf - p96 - (c) production of monoclonal antibody #al11/2.2.monoclonal antibody#
  - (HIV) antigen / p24 ; **A** capsid protein / capsomere(s) / protein coat **R** HIV

    (time needed) so, immune response / clonal expansion / production of B-lymphocytes / production of plasma cells, can occur ;
    A B-cells / splenocytes
    R plasma cells need to multiply
    I *ref. to* antibody production

  - *any one from*
    immortal / long-lived ;
    able to replicate / capable of cell division ;
    uncontrolled cell division, can grow / survive, in cell culture ;
    cannot grow on, HAT / hypoxanthine-aminopterin-thymidine / step **4**, (culture) medium ;
    A do not have gene coding for ability to grow on HAT

    ---

    hybridoma ;

    ---

    any one from
    (check cells for) production / AW, (by hybridoma cells) of, anti-HIVp24 antibody / antibody against p24 ;
    A the antibody / monoclonal antibody
    A check cells, contain / have / AW, desired antibody / AW

    idea that only want cells that produce desired antibody / do not want cells that produce different antibodies / need to remove cells that don't produce the antibody ;
    waste of, money / resources, to culture other cells / if no antibody produced ;

- S18-22 3 p2-2018.pdf - p41 - (c) secondary immune response, specificity #al11/1.3. immu

e response#

- (composed of) many / chain of / polymer of / AW, monosaccharides / sugar monomers / sugar units ;
  A glucose, molecules / residues
  A more than two / many sugars

  further detail ; e.g. carbohydrate
  may be, branched / unbranched *in context of polysaccharide*
  macromolecule *in context of polysaccharide*
  glycosidic bonds *in context of between sugar monomers*
  (sugar monomers) joined by condensation reactions

- *three from:*

  1 specificity / specific (in correct context) ;

  2 (B / T, -) lymphocytes have receptors complementary to antigen ;
  A immunoglobulins / antibody *as receptors for B-lymphocyte*
  A surface molecules *as receptors for T-lymphocytes*

  3 (different) antigens, stimulate / activate / AW, (different) B-lymphocytes / T-lymphocytes ;
  A antigens stimulate an immune response

  4 *idea that* different antibodies, synthesised / produced / AW, for different (O) antigens / O polysaccharides / lipopolysaccharides ;

  5 memory cells will, not respond to different antigen / only respond to same antigen / AW ;

  6 different O-antigens can, be composed of different sugars ;
  A can have different shapes

● S18-22 6 p2-2018.pdf - p46 - b) the use of monoclonal antibodies in the treatment of dise se #al11/2.2.monoclonal antibody#

- *two from:*

  treatment of disease
  I *statements about locating or diagnosis of disease*

  specific / targeted, therapy / treatment ;
  A specific to diseased, cells / tissue
  A examples

  bind to / recognition of, receptors / antigens, on cell surface (of diseased cells) ;

  kill the cell by stimulating the immune system / AW ;
  A correct immune responses e.g. stimulates phagocytosis / activates B-cells

  attach, radioactive substance / drug (to treat / kill diseased cells) / AW ;

  treat infectious diseases / bind to (antigens on) pathogens / recognition of antigens on pathogens ; **A** viruses
  I bacteria *unless stated that they cause disease*
  allow examples such as treatment of ebola or rabies or tetanus (by immunising with antibody)

● M18-22 p2-2018.pdf - p4 - 2

- p2-2018.pdf - p4 - a. the mode of action of a macrophage #al11/1.1.phagocytes#
-

bone marrow ;

---

accept points from a diagram

*max **three** from:*

1 detection / recognition ;
e.g. detects (named type of) pathogen
recognises, (foreign) antigens / antibodies complexed to antigens
has receptors (for antigens)
2 engulfs / envelops, pathogen / bacterium / AW ;
A phagocytosis occurs
A endocytosis occurs
A pseudopodia form
3 forms, vacuole / vesicle / phagosome ;
4 ref. to lysosome fusion ;
5 ref. to hydrolytic / digestive, enzymes ;
A named examples
A hydrolases
6 ref. to antigen presentation ;
7 AVP ; e.g. (response is) non-specific / innate

---

*any **one** valid suggestion from:*

produces inhibitors for / deactivates, lysosomal enzymes ;
escapes out of phagosome ;
forms resistant spore / is resistant to digestive enzymes ;
AVP ; e.g. suggestion of macrophage malfunction

- w19-23 p2-2019.pdf - p108 - 5
  - p2-2019.pdf - p109 - c. the production of antibodies #al11/1.3. immune response#
    - *four from*

      1 antigen presentation ; *in correct context*

      2 clonal selection / activation, of specific, B-lymphocytes / T-lymphocytes ; **A** B cells / T cells

      3 (lymphocytes) divide by mitosis / undergo clonal expansion ;

      4 B-lymphocytes, differentiate into / mature into / form / AW, plasma cells ;

      5 antibodies secreted by plasma cells ;

      6 T-helper cells secrete cytokines ;

      7 cytokines stimulate / AW, B-lymphocytes / plasma cells / humoral response ;

  - p2-2019.pdf - p109 - d. the advantage and disadvantage of artificial passive immunity #a 11/2.4. vaccine and immunity#

- *max 2 (out of total three marks)*
  advantages
  allow references to other pathogen types

  1 antibodies are provided to people immediately / no delay for plasma cells to secrete antibodies ;
  A immediate, immunity / protection
  R immediate (immune) response

  2 antibodies, immediately neutralise toxins / prevent viruses entering cells ;

  3 prevents disease (in the individual) / promotes quicker recovery ;

  4 prevents spread of the pathogen through the population / prevents people dying ;

  5 antibodies can be manufactured quickly in response to mutations that occur in virus / AW ;

  max 2 (out of total three marks)
  disadvantages

  6 short-term / temporary (immunity) ;

  7 no memory cells produced ;

  8 can have infections of same pathogen again ;

  9 allergic reaction / immune response, to the (non-human) antibodies given ;

  10 *ref. to* cost qualified ; e.g. needs to be repeated / high cost of production of antibodies

  11 AVP – for advantage (A) or disadvantage (D) ;
  e.g. (A) passive can be used for people who are malnourished / immunosuppressed
  e.g. (A) *ref. to* using a vaccine with a (live) pathogen that might give person the disease

    - across the placenta ; **A** via umbilical cord
      in breast milk / colostrum / breast feeding / during lactation ;

- S19-23 3 9700_s19_qp_23.pdf - p9 - (c)
  - 9700_s19_qp_23.pdf - p9 - i. specificity receptor #al10/1.3.transmission of disease#
    - to, bind / attach / AW, HIV / virus / pathogen, to, host cell / T-lymphocyte / T-cell ;
      (because it) binds / is complementary, to, CD4 receptor proteins / AW ;

      ref. to binding leads to, entry of virus into cell / endocytosis / fusion of viral envelope with host cell (surface) membrane ;

  - 9700_s19_qp_23.pdf - p10 - ii. helper T cell function #al11/1.3. immune response#
    - *ref. to* less cytokine (released) ; *in context of fewer helper T-lymphocytes*

      any one from:

      (so) fewer B-lymphocytes divide by mitosis / AW ; **A** humoral response decreased

      (so) fewer B -lymphocytes stimulated to differentiate into plasma cells / AW ;

      (so) fewer plasma cells to, produce / secrete antibodies ;

- S19-21 1b
  - p2-2019.pdf - p20 - ii make hybridoma cells #al11/2.2.monoclonal antibody#
    - cell / membrane, fusion / AW ; **I** 'mix'
      (named) fusogen / hybridogen used ; e.g. polyethylene glycol / electrofusion / electric current
      A PEG for polyethylene glycol
      (between) plasma cell / (activated) B-lymphocyte / (activated) B-cell / splenocyte, **and**, tumour / cancer / myeloma, cell ;
      R β cells

  - p2-2019.pdf - p20 - iii. the use of monoclonal antibodies in the treatment of disease #al 1/2.2.monoclonal antibody#
    - *any three from:*

      1 some mAbs act **directly** on target cells / some mAbs work **indirectly** to kill cells / mAbs do not damage other (non-target) cells ;

      2 by binding to, specific / complementary, antigens/cell surface receptors ;

      3 (named), drugs / radioactive isotopes, can be attached to mAbs ;
      A 'tagged'
      I labelled

      4 enzymes can be attached to mAbs ;

      5 so drug can be activated at site of action (linked to mp4) ;

      6 bispecific mAbs attach two cells together ;

      7 *ref. to* interrupting cell signalling ;

      8 use of mAbs for passive immunity ; **A** described *in context of therapeutic antibody for treatment of disease*

      9 stimulating / AW, immune system / phagocytes / macrophages / T-lymphocyes, to kill, cancer cells ;

      10 name of a cancer or autoimmune disease that is treated with mAbs ;

- M19-22 3 p2-2019.pdf - p8 - b application of monoclonal antibody #al11/2.2.monoclonal ntibody#
  - *any **two** from:*

    1 testing for the presence of different, antigens / (*Plasmodium*) proteins ;
    2 antibodies are, specific / have specific shape ;
    A ref. to complementarity
    3 different monoclonal antibodies have, different, variable regions / antigen binding sites ;
    4 (pLDH / HRP-2 / *Plasmodium*) protein, binds to / complexes with, (monoclonal) antibody ;

  - *any **two** from:*

    (positive result of test strip 1) pLDH present, (so) the person, has malaria / is infected by *Plasmodium* ;
    I species names

    (negative result of test strip 2) HRP-2 not present, (so) the cause of malaria is not / the person is not infected by, *P. falciparum* ;
    (negative result of test strip 2) HRP-2 not present, (so) the person is infected by *Plasmodium* other than *P. falciparum* / AW ;

- W20-22 4
  - p2-2020.pdf - p92 - (c) the importance of clonal expansion #al11/1.3. immune response#

- *any **three** from:*
  large numbers of B-lymphocytes / plasma cells (in primary immune response)
  1 large quantity of (specific) antibody, produced / released
  or
  (large quantity of) antibody to form antibody-antigen complexes / to bind antigen (for phagocytosis) / AW ;

  large numbers of memory B-lymphocytes so
  2 provide long term immunity / memory cells long-lived / provides immunological memory ;
  A remain in, circulation (for a long time) AW

  3 able to produce fast(er), secondary (immune) response ;
  A second response will be fast(er)
  A immune response faster on second encounter (with antigen / pathogen) / AW

  4 higher concentration / faster production, of antibodies (than primary response) ; **I** 'more' alone

  5 person does not have, symptoms / become ill (of / from, same disease) ;
  A presence of same, pathogen / antigen, does not cause disease

  6 AVP ; memory cells can (divide to) produce plasma cells
  more plasma cells present than primary response
  able to form more memory cells

- p2-2020.pdf - p92 - d. self and non-self antigen #al11/1.2. antigen and antibodies#
  - *any **two** from:*
    immune response / antibodies produced, against, self antigens ;
    I immune system attacks self
    A autoimmunity / autoimmune disease

    idea that faulty B-lymphocytes not destroyed ;
    A *ref. to* T-lymphocytes *if in correct context*

    (specific) antibody, binds to / acts on / AW, self-antigen / receptor, on the (cell surface membranes of) muscle cells / at neuromuscular junction ;
    A antibody binds to acetylcholine receptors

    ref. to consequence to muscle cells ; e.g.(nerve) impulse conduction impaired action of transmitter substance hindered

● S20-23 p2-2020.pdf - p52 - 2(c,d)

● p2-2020.pdf - p53 - c. primary response vs secondary response #al11/1.3. immune response#

- *any three from*
  higher concentration of antibodies ;
  faster production of antibodies ;
  because of presence of memory, B-lymphocytes / B cells ;
  higher numbers of specific B-lymphocytes, so increased chance of faster recognition / because of clonal expansion in first response ;
  AVP ; e.g. also more memory T-cells to stimulate B-lymphocyte response
  ref. to higher concentration antibodies in circulation remaining after recovery

● p2-2020.pdf - p54 - d. self and non self antigen, 跟w20-22.2一起看 #al11/1.2. antigen and antibodies#

- *any two from*
  result of an autoimmune disease / AW ;
  antibodies produced against, self-antigens / antigens on body cells
  or
  antibodies bind to self-antigens / antigens on (own) body cells ;
  detail ; e.g. prevents functioning of muscle cells
  binds to receptors on muscle cells

● S20-22 1 p2-2020.pdf - p35 - (c) ,With reference to Fig. 1.1, describe how the picornavirus nters the host cell. #al4/2.1 transport#

- *any three from*
  virus binds to receptors (on host cell surface membrane) ;
  ref. to specificity / complementary shapes / complementary binding ;
  endocytosis ;
  description ; e.g. membrane infolds / pinches in
  vesicle formed ; **A** vacuole

● S20-22 p2-2020.pdf - p38 - 3

● p2-2020.pdf - p38 - a. pathogen name for TB #al10/1.1.infectious disease#

- *Mycobacterium tuberculosis* ; **A** *Mycobacterium bovis*

● p2-2020.pdf - p38 - b. the transmission of TB #al10/1.3.transmission of disease#

-

any one from
live in an area that has cases of TB ;
recently returned from countries with TB ;
born in a country with TB ;
parents / grandparents whose origin country has TB
contact with a person who has TB ;
AVP ; e.g. *ref. to* compromised immune system
mother who is HIV-positive

- p2-2020.pdf - p39 - d. *** vaccine specificity #al11/2.4. vaccine and immunity#
  - *any two from*
    max 1 if no ref. to antigens
    leprosy bacterium has similar (shaped) antigens ;
    memory cells, recognise / bind, antigens on leprosy bacterium ;
    anti-TB antibodies also bind to leprosy antigens ;
    AVP ; e.g. similar / same, genes so synthesise similar proteins
- p2-2020.pdf - p39 - e. artificial active vs natural passive #al11/2.4. vaccine and immunity#
  - *any three from*

artificial active	natural passive
deliberate / AW **A** from medical staff	**or** not deliberate / from mother / in breast milk / across placenta ;
vaccine / (foreign) antigens in injection	**or** antibodies passed on ;
immune response	**or** no immune response ;
antibodies / memory cells produced	**or** no, antibodies / memory cells produced ;
longer lasting	**or** short-lived ;
protection not immediate	**or** immediate protection ;

- w21-22 p2-2021.pdf - p46 - 6,
  - p2-2021.pdf - p46 - a. auto immune disease, 不考了