PEARSON EDEXCEL A-LEVEL BIOLOGY B · 9BI0

BIOLOGY



MARK SCHEME

TOPIC 2: CELLS, VIRUSES AND REPRODUCTION OF LIVING THINGS

EUKARYOTIC AND PROKARYOTIC CELL STRUCTURE AND FUNCTION

SCORE	PERCENTAGE
/143	%

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Mark Scheme

Q1.

Question Number	Acceptable Answer	Additional guidance	Mark
(a)(i)	• length of cell = 20 (mm) (1) • conversion into μm = 20000 ÷ 23.5 (1) • magnification = 851 (1) • [ecf applies for mp 2 and 3]	Accept ± 1 mm Accept other appropriate calculation, e.g. measure in cm or converting 23.5 μm to mm or cm Correct answer gains full marks	**(3)**

Question Number	Acceptable Answer	Additional guidance	Mark
(a)(ii)	A description that makes reference to the following: • centromeres have separated (1) • spindle fibres have {shortened / contracted} (1) • chromatids pulled apart (1) • chromatids have moved to opposite poles (1)		**(4)**

Question Number	Acceptable Answer	Additional guidance	Mark
(b)(i)	C		**(1)**

Question Number	Acceptable Answer	Additional guidance	Mark
(b)(ii)	Because E is {in cytokinesis / in late telophase / dividing its cytoplasm} but G is still in {anaphase / mitosis} (1)		**(1)**

Q2.

Question Number	Answer	Additional Guidance	Mark
(a)	1. bacteria are cells, viruses are {not / particles} ; 2. idea of bacteria surrounded by {cell wall / slime / capsule } , viruses surrounded by {protein / capsids / envelope} **;** 3. bacteria have { plasmids / ribosomes / other named structure} , viruses do not have {plasmids / ribosomes / other named structure } ; 4. bacteria (genome) are DNA, viruses can be DNA or RNA ; 5. bacterial DNA is double-stranded, viral genetic material is single (or double) stranded / eq ; 6. idea that bacteria have {circular / eq} genetic material, viruses have {linear / straight} genetic material ;	**NB** piece answers together throughout **Accept** only matched structures **2. Accept** for envelope: membrane / phospholipid layer / eq **3. Accept** bacteria have membranes, flagella cytoplasm, glycogen, lipid droplets **6. Not** in context of plasmid	**(3)**

Question Number	Answer	Additional Guidance	Mark
(b)(i)	1. reference to humoral (immune) response ; 2. reference to {phagocytosis / eq} by {phagocytes /named phagocyte} ; 3. reference to macrophages as { antigen-presenting cells / APCs} (to T helper cells) ; 4. reference to B cells as { antigen-presenting cells / APCs} (to itself) ; 5. idea that T helper cells release cytokines for B cell {activation / stimulation} ; 6. idea of B cells {forming clones / dividing /eq} (to form B effector cells) ; 7. reference to {differentiation of B cells into plasma cells / formation of plasma cells from B cells} (subsequent to cloning) ;	**2. Accept** dendritic cells / Langerhans cells / B cells **3 Accept** dendritic cells / Langerhans cells 4. **Accept** antigen binds to B cells **6. Not** to form plasma cells	**(4)**

Question Number	Answer	Additional Guidance	Mark
(b)(ii)	1. reference to {opsonisation / antibodies bind to bacteria / eq} ; 2. (as a result) enhancing phagocytosis / eq ; 3. reference to {immobilisation / agglutination / eq } (of bacteria) ; 4. idea of antibodies neutralising toxins / eq ;	**1. Not** reference to killing bacteria **2. Accept** easier, better	**(2)**

Question Number	Answer	Additional Guidance	Mark
(b)(iii)	1. idea that the immune response will be weaker ; 2. person may not recover from this infection / eq ; 3. idea of {other (opportunistic) infection / cancer} ; 4. reference to cytokines released from {T helper / CD4 } cells ; 5. idea that cytokines are involved in {activation / division } of {B cells / T killer cells} ; 6. credit consequence of impaired B cell function ; 7. credit consequence of impaired T killer cell function ;	**1. Accept** in context of either humoral or cell-mediated immune response **6. Accept** e.g. no antibody produced by plasma cells **7. Accept** e.g. infected cells not destroyed	**(4)**

Q3.

Question Number	Answer	Additional Guidance	Mark
(i)	B matrix	A is incorrect because crista are folds in the membrane C is incorrect because stroma is in chloroplasts D is incorrect because thylakoids are in chloroplasts	

Question Number	Answer	Additional Guidance	Mark
(ii)	An explanation that makes reference to the following: • because the resolution of the microscope used for P is {lower / worse} (1) • to distinguish {the small distance between the two membranes / the membranes as separate structures} (1)	ACCEPT converse for Q throughout DO NOT ACCEPT magnification ACCEPT (inter membrane) space can be seen between membranes / the inner and outer membrane can be seen/ two lines can be seen	

Q4.

Question Number	Answer	Additional Guidance	Mark
(i)	An explanation that makes reference to the following: • because different types of lipid are found in the mitochondria and chloroplasts **(1)** • because mitochondria are associated with { respiration / oxidative phosphorylation} whereas chloroplasts are associated with {photosynthesis / light-dependent reactions / photophosphorylation} **(1)** • because mitochondria contain {electron transport proteins / cytochromes / cristae / stalked particles} whereas chloroplasts contain {grana / chlorophyll / photosystems / carotenoids} **(1)**	**Accept** a description of the differences e.g. a lipid high in mitochondria is low in chloroplast, only two of the lipids are found in both organelles **Do not accept** a list of values from the table without some sort of comparison **Accept** any other membrane difference	**(3)**

Question Number	Answer	Additional Guidance	Mark
(ii)	A diagram that shows the following: • a glycosidic bond between C 1 on galactose and C 6 on MGDG **(1)** • rest of molecules complete **(1)** • water molecule **(1)**	 ecf if glycosidic bond drawn between C1 and C 4 **Accept** H_20 / water	 **(3)**

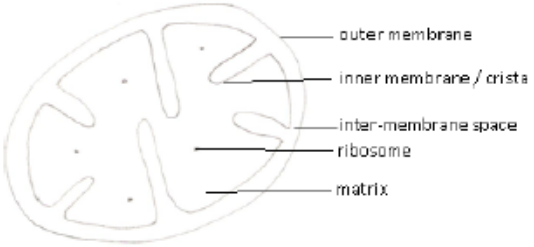
Question Number	Answer	Mark
(iii)	**The only correct answer is B** ***A*** *is not correct because DGDG is larger than MGDG so will not travel as far and sulfolipid is the smallest quantity so will be the smallest spot* ***C*** *is not correct because DGDG is larger than MGDG so will not travel as far and sulfolipid is the smallest quantity so will be the smallest spot* ***D*** *is not correct because sulfolipid is the smallest quantity so will be the smallest spot*	 **(1)**

Q5.

Question Number	Acceptable Answer	Additional Guidance	Mark
(i)	An explanation that makes reference to the following points: • examine cells from different tissues in the mature sea urchin, under a microscope (1) • cells descended from the repositioned cell are fluorescent due to traces of the dye injected (1)		**(2)**

Question Number	Acceptable Answer	Additional Guidance	Mark
(ii)	An explanation that makes reference to the following: • the cell was (still) pluripotent (1) • therefore cell signalling in the new position could determine the fate of the cell (1) • causing activation of transcription factors for transcription of genes relevant to the new position (1) • leading to synthesis of proteins for development into different tissue (1)	Allow totipotent	**(4)**

Q6.

Question Number	Answer	Additional Guidance	Mark
	A drawing that shows the following: Drawing marks : • 2 membranes drawn (1) • (continuous) inner membrane (of two) folded (1) Label marks : Any **two** from • {inner membrane / crista} and outer membrane (1) • inter-membrane space (1) • matrix (1) • ribosome (1)		**(4)**

Q7.

Question Number	Answer	Additional Guidance	Mark
	Q: nucleus	**Do not accept** nucleolus	**(1)**

Q8.

Question Number	Answer	Mark
(i)	**The only correct answer is C** ***A*** *is not correct because not all RNA viruses have envelopes and only the retroviruses contain reverse transcriptase* ***B*** *is not correct because only the retroviruses contain reverse transcriptase* ***D*** *is not correct because not all RNA viruses have envelopes and they are not all helical*	**(1)**

Question Number	Answer	Mark
(ii)	**The only correct answer is A** ***B*** *is not correct because λ phage has DNA* ***C*** *is not correct because λ phage has DNA* ***D*** *is not correct because λ phage has DNA*	**(1)**

Q9.

Question Number	Answer	Additional Guidance	Mark
(i)	C 2 *A is incorrect as the nucleus and mitochondria have double membranes* *B is incorrect as the nucleus and mitochondria have double membranes* *D is incorrect as only the nucleus and mitochondria have double membranes*		**1**

Question Number	Answer	Additional Guidance	Mark
(ii)	A 1 only *B is incorrect because voltage gated channels will not open when light affects rod cells* *C is incorrect because less neurotransmitter is released when light affects rod cells* *D is incorrect because less neurotransmitter is released when light affects rod cells*		**1**

Q10.

Question Number	Acceptable Answer	Additional Guidance	Mark
	• plant cells have cellulose walls, whereas animal cells do not		**(1)**

Q11.

Question Number	Answer	Additional Guidance	Mark
	An explanation that makes reference to the following: • release energy / make ATP (1) • for {ion pump / Na^+ - K^+ pump / active transport of ions / regeneration of rhodopsin / combine opsin and retinal /convert trans retinal into cis retinal} (1)	**DO NOT ACCEPT** active transport alone	**(2)**

Q12.

Question Number	Answer	Mark
	The only correct answer is C ***A*** *is not correct because Salmonella are gram negative bacteria so will have a thin peptidoglycan cell wall* ***B*** *is not correct because Salmonella are gram negative bacteria so will have a thin peptidoglycan cell wall and they produces endotoxins* ***D*** *is not correct because Salmonella produces endotoxins*	**(1)**

Q13.

Question Number	Answer	Additional Guidance	Mark
	A description that makes reference to three of the following: • vesicles containing protein from rER {move to / fuse with} Golgi (1) • proteins {modified / glycosylated / carbohydrates / lipids attached} (1) • proteins leave (Golgi) in vesicles (1) • vesicles fuse with cell membrane (1)	**Accept** quarternary structure formed / conjugated protein formed **Accept** package into vesicles	**(3)**

Q14.

Question Number	Answer	Additional Guidance	Mark
(i)	The only correct answer is: **D** smooth endoplasmic reticulum *A is incorrect as centriole has microtubules* *B is incorrect as a nucleus has a nucleolus* *C is incorrect as there are no ribosomes*		**1 comp**

Question Number	Answer	Additional Guidance	Mark
(ii)	The only correct answer is: **D** P S R *A is incorrect because the SER is not involved in protein synthesis* *B is incorrect because Golgi should be after the RER* *C is incorrect because the SER is not involved in protein synthesis*		**1 comp**

Question Number	Answer	Additional Guidance	Mark
(iii)	An explanation that makes reference to the following: • (because lysosomes) contain enzymes (1) and **one** from • to {digest / hydrolyses} {pathogens / bacteria / viruses / proteins / antigens} (1) • to digest (old) organelles (1) • for apoptosis / autolysis of cells (1)	**Accept** correct named hydrolytic enzyme, e.g. protease / lysozyme **Accept** other correct biological molecules **Accept** breakdown pathogens / bacteria / viruses / proteins / antigens **with** hydrolytic / digestive enzymes for **2 marks** **Accept** self-digest (damaged) cell	**2 exp**

Q15.

Question Number	Answer	Additional guidance	Mark
(i)	A description that makes reference to two the following: • DNA strands separate (1) • antisense strand used as template (for mRNA) (1) • RNA polymerase synthesises mRNA (1)		**(2)**

Question Number	Answer	Additional guidance	Mark
(ii)	A description that makes reference to five of the following: • mRNA leaves through nuclear pores (1) • {translation occurs at / mRNA travels to} ribosomes / rough endoplasmic reticulum (1) • codons (on mRNA) pair with anticodons on tRNA / tRNA brings amino acid (to the ribosome) (1) • peptide bonds form between amino acids (1) • amylase enters Golgi and is {modified / processed} / amylase {is packaged into vesicles / travels in vesicles} (1) • exocytosis releases {amylase / protein} (1)	Accept protein for amylase Accept description for exocytosis	**(5)**

Mark Scheme

Q1.

Question Number	Acceptable Answer	Additional guidance	Mark
	An explanation that makes reference to the following: • there is a zone of inhibition around the penicillin disc / because penicillin only affects Gram positive bacteria (1) Plus two from the following points: • because it has a thick cell wall (1) • because penicillin interferes with formation of cross links (1) • during synthesis of new cell wall (1) • this results in bacteria being susceptible to osmotic shock (1)		**(3)**

Q2.

Question Number	Acceptable Answer	Additional Guidance	Mark
	A description that makes reference to the following: • inhibits formation of (new) crosslinks in peptidoglycan in cell wall (1) • causing lysis of cell due to osmotic pressure (1) • therefore penicillin is bactericidal (1)		**(3)**

Q3.

Question Number	Answer	Additional Guidance	Mark
(i)	• benzylpenicillin		**(1)**

Question Number	Answer	Additional Guidance	Mark
(ii)	An answer that makes reference to one of the following: • human cells are {eukaryotic / lack cell wall / lack peptidoglycan} (1) • human cells have different {ribosomes / enzymes} (1)	**ACCEPT** these antibiotics only affect prokaryotes	**(1)**

Q4.

Question Number	Answer	Mark
(i)	**The only correct answer is C** ***A*** *is not correct because cellulose is not found in a bacterial cell* ***B*** *is not correct because cellulose and nucleoli are not found in a bacterial cell* ***D*** is not correct because nucleoli are not found in a bacterial cell	**(1)**

Question Number	Answer	Mark
(ii)	**The only correct answer is C** ***A*** *is not correct because Ebola contains RNA* ***B*** *is not correct because HIV contains RNA* ***D*** *is not correct because tobacco mosaic virus contains RNA*	**(1)**

Question Number	Answer	Additional Guidance	Mark
(iii)	An explanation that makes reference to the following: • the resolution is higher / better (1) • because wavelength of electrons is short(er) (1)	**ACCEPT** converse **ACCEPT** smaller wavelength	**(2)**

Q5.

Question Number	Answer	Additional Guidance	Mark
(a)	1. bacteria have DNA, viruses have DNA or RNA ; 2. idea that bacteria have {circular / eq} genetic material, viruses have {linear / straight} ; 3. bacterial DNA is double-stranded, viral {DNA / RNA} is single (or double) stranded / eq; 4. bacteria (may) have plasmids, viruses do not have plasmids / eq;	**NB** piece answers together throughout **Do not accept** in context of plasmid	**(2)**

Question Number	Answer	Additional Guidance	Mark
(b)(i)	1. reference to {phagocytosis /endocytosis / engulfing} ; 2. credit details of phagocytosis ; 3. reference to bacterium inside a {vacuole / vesicle / phagolysosome} ;	eg formation of {pseudopodia / membrane extensions around bacteria} / cytoplasmic streaming / binding to bacteria **Not** phagolysozyme	(2)

Question Number	Answer	Additional Guidance	Mark
(b)(ii)	1. idea that bacteria need to be accessible to antibiotics ; 2. idea of bacteria inside macrophages ; 3. reference to waxy layer of (these) bacteria ; 4. idea that (bacteriostatic) antibiotics affect dividing bacteria; 5. reference to antibiotic resistance (of these bacteria) ;	**Not** bacteriocidal antibiotics	(2)

Question Number	Answer	Additional Guidance	Mark
(b)(iii)	1. idea of {dead / attenuated / eq} {organisms / pathogen / bacterium / eq} put into person; 2. reference to (stimulation of) {specific / primary} (immune) response ; 3. credit details of T helper cell activation ; 4. credit details of B cell activation ; 5. credit details of T killer cell activation ; 6. reference to production of memory cells ;	**NB** not simply crediting ref to vaccination as in stem of question **Accept** antigen eg macrophages as APCs eg involvement of cytokines, B cells as APCs eg involvement of cytokines, infected cells as APCs	(3)

Question Number	Answer	Additional Guidance	Mark
(c)	1. reference to {<u>further</u> lung damage / severe breathing problems / eq} ; 2. idea that the *Mycobacterium* get into the {blood / lymph}; 3. idea that organ failure (leads to death) ; 4. idea of {reduced / weakened} immune response (due to a loss of T cells) ; 5. credit detail of role of T (helper) cells ; 6. credit detail of effect of no T killer cells ; 7. credit detail of effect of no B cells ; 8. ref to {secondary / opportunistic / other} infections (causing death) ;	eg cannot obtain enough oxygen eg production of cytokines eg infected cells will not be destroyed eg no antibody produced	(4)

Q6.

Question Number	Answer	Additional Guidance	Mark
(i)	• length of scale line given in μm • magnification calculated	1.7 × 10000 / 17000 1.7×10^{3} / 0.0017×10^{6}	

Question Number	Answer	Additional Guidance	Mark
(ii)	width of GM aperture divided by width of non-modified aperture	In the range of 1.3 to {4 / 4.0} to no more than 1 decimal place DO NOT ACCEPT with units or %	

Q7.

Question Number	Answer	Additional Guidance	Mark
	• correct calculation of magnification (x 10 000) • correct calculation of diameter (1)	Example of calculation: magnification: 10 000 μm ÷ 1 μm = × 10 000 diameter: 54 mm ÷ 10 000 = 5.4 μm **Accept** range between 5.3 μm to 5.5 μm Correct answer with units gains full marks	**(2)**

Q8.

Question Number	Answer	Additional Guidance	Mark
(i)	An answer that makes reference to three of the following: **Similarity** • both have peptidoglycan (1) **Two differences from:** • positive has {more / thicker layer of} peptidoglycan than negative / positive has a thicker cell wall than negative (1) • positive has teichoic acid, negative does not (1) • negative has outer membrane, positive does not (1) • negative (most) has periplasmic space, positive does not (1) • negative has {more lipid / lipopolysaccharide / porin proteins}, positive does not (1)	Accept periplasm	**(3)**

Question Number	Answer	Additional Guidance	Mark
(ii)	• subtraction using values from graph (1) • calculation of percentage change (1)	$10^8 - 10^2 = 99\ 999\ 900$ $\div 10^8 \times 100 = \mathbf{99.9999}$ Correct answer gains full marks, with no working shown.	**(2)**

Question Number	Answer	Additional Guidance	Mark
(iii)	An answer that makes reference to the following: • it is effective if irradiation longer than 3 hours (1) • it is effective against E. coli which infect the intestine (1) • not all species of {pathogenic bacteria / bacteria causing food poisoning} investigated / only three types of bacteria investigated (1) • toxins may remain in food (1)	Accept effectiveness depends on how long it is irradiated for	**(4)**

Q9.

Question Number	Answer	Additional Guidance	Mark
(i)	• maximum width × magnification **(1)** • correct gap width with appropriate units **(1)**	$20 \times 10^{-3} \times 12\,000 = 240$ = 0.24 mm / 240 µm / 240 000 nm / 24×10^4 nm **Accept** correct minimum gap width with appropriate units for 1 mark	**(2)**

Question Number	Answer	Additional Guidance	Mark
(ii)	An explanation that makes reference to the following: • because the resolution of the microscope is {not high enough / is too low} **(1)** • as the membranes are too close together to be distinguished as separate structures **(1)**	**Do not accept** magnification **Accept** as separate lines **Do not accept** magnification	**(2)**

Q10.

Question Number	Answer	Additional Guidance	Mark
(i)	• *Salmonella* (species) (1)	Candidates may name other types of bacteria, each of which will need looking up **ACCEPT** phonetic spellings **ACCEPT** *Shigella, Neisseria, Escherichia, Pseudomonas, Klebsiella, Proteus, Providencia, Escherichia, Morganella, Aeromonas, Citrobacter* **ACCEPT** specific examples e.g. *E.coli* **IGNORE** pathogens **DO NOT ACCEPT** gram positive bacteria e.g. *Actinomyces, Clostridium, Mycobacterium, Streptococci, Staphylococci, Nocardia*	(1) EXP

Question Number	Answer	Additional Guidance	Mark
(ii)	• gram negative bacteria have {a thinner peptidoglycan cell wall / an (outer) lipopolysaccharide (layer) / an outer membrane } (1)	**ACCEPT converse for gram positive bacteria** **ACCEPT** less peptidoglycan murein for peptidoglycan larger periplasm (space) no teichoic acid (in cell wall)	(1) GRAD

Q11.

Question Number	Acceptable Answer	Additional Guidance	Mark
	C (*Paramecium* is a eukaryote and the bacterium is a prokaryote)		**(1)**

Q12.

Question Number	Answer	Additional Guidance	Mark
	An answer that makes reference to the following: • so that some organelles are clearly visible (1)	**Accept** converse Allow named organelles	**(1)**

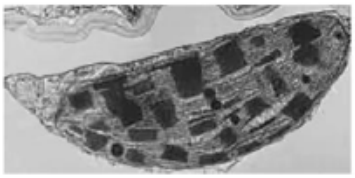
Q13.

Question Number	Answer	Additional Guidance	Mark
(i)	An answer that makes reference to two of the following: • Gram positive bacteria have more peptidoglycan than Gram negative bacteria (1) • Gram positive stains {purple / blue} (with Gram stain), but Gram negative do not stain {purple / blue} (with Gram stain) (1) • Gram positive contains {teichoic acid / lots of murein} but Gram negative do not (1) • Gram positive have no {periplasmic space /outer membrane} but Gram negative do (1)	Allow Gram positive have a thicker cell wall thanGram negative Allow Gram positive stains {purple / blue} (withGram stain), but Gram negative stain red (with Gram stain) Allow Gram positive have low {lipid / phospholipid} content but Gram negative havehigh {lipid / phospholipid} content	(2)

Question Number	Answer	Additional Guidance	Mark
(ii)	An answer that makes reference to the following: • conversion of micrometres to mm (1) • calculation of speed (1)	Example calculation 1µm = 0.001 mm 0.001 x 100 = 0.1 (mm s^{-1}) Correct answer with no working gains full marks	(2)

Question Number	Answer	Additional Guidance	Mark
(iii)	An explanation that makes reference to two of the following: • BvB can kill gram negative bacteria (1) • without side effects for humans (1) • therefore could be useful when treating resistant bacterialinfections (1)	Allow bacteria cannot become resistantto BvB	(2)

Q14.

Question Number	Acceptable Answer	Additional guidance	Mark
(c)	**A** ()		**(1)**

Q15.

Question Number	Acceptable Answer	Additional guidance	Mark
	synthesis of ribosomes		**(1)**

Q16.

Question Number	Answer	Additional Guidance	Mark
	An explanation that makes reference to the following: • large numbers of mitochondria (1) • to provide ATP for active uptake of {glucose / salts / amino acids} (1) • microvilli providing large surface area (1) • for many carrier proteins for {glucose / salts / amino acids} (1)	**Accept** correct named minerals	**4**

Q17.

Question Number	Answer	Additional Guidance	Mark
(i)	An explanation that makes reference to three of the following: • because the food poisoning was happening {after one hour /within a few hours} of the meal **(1)** • indicating that exotoxins caused the food poisoning **(1)** • because endotoxins are only present after {about 12 hours / several hours / when the bacterial cells are estroyed} **(1)** • *Staphylococcus* releases exotoxins / endotoxins come from *Salmonella* **(1)**	**Accept** soon after meal / quickly / by {12 / 1} o clock **Do not accept** *Staphylococcus* is an exotoxin / *Salmonella* is an endotoxin	**(3)**

Question Number	Answer	Additional Guidance	Mark
(ii)	A description that makes reference to any four of the following: • isolate the bacteria from the {food / patient / faeces / vomit} **(1)** • look at the colonies to see if they have a {characteristic / named characteristic} (of *Staphylococcus*) **(1)** • use Gram stain to show presence of Gram positive bacteria **(1)** • grow on selective media that identify {*Staphylococcus* / eliminates other bacteria} **(1)** • use antibodies against *Staphylococcus* **(1)**	**Accept** a description of how this is done e.g. streak plating from a faecal sample **Accept** *Staphylococci* will appear purple with Gram stain **Accept** differential media / selective agar / named example e.g. mannitol salt agar / with antibiotics	**(4)**

Q18.

Question Number	Answer	Additional Guidance	Mark
(i)	• {fewer / smaller} cristae / less folding of the inner membrane / reduced surface area of inner membrane		(1)
(ii)	An explanation that makes reference to two of the following: • (fewer cristae / lower surface area) therefore reduced electrontransport chain (1) • because ribosomes prevented from synthesising {enzymes / ATPase / electron transport molecules} (1) • credit reason linked to protein not made (1)	e.g. no enzymes to catalyse steps in Krebs cycle, noATPase channels for {protons to pass through / phosphorylation of ADP}, no ETC so no redox reactions **ACCEPT** less intermembrane space foraccumulation of protons = 1 mark	(2)
(iii)	An explanation that makes reference to the following: • no ATP will be produced (if both inhibited / glycolysis inhibited) (1) • therefore no {energy / ATP} for metabolic process / named metabolic processes / cell division} (1)		(2)

Q19.

Question Number	Answer	Additional Guidance	Mark
	An answer that makes reference to the following: **Similarities** • both contain DNA (1) **Differences** • HPV is surrounded by {protein / capsid} and chlamydia by {a cellwall / peptidoglycan} (1) • HPV is hollow and chlamydia has {cell membrane / cytoplasm / ribosomes / glycogen granules / lipid droplets / plasmids}	**ACCEPT** DNA strands in HPV **ACCEPT** chlamydia has {cell membrane / cytoplasm / ribosomes / glycogen granules / lipiddroplets / plasmids} but HPV does not	(3)

Q20.

Question Number	Answer	Additional Guidance	Mark
(i)	An answer that makes reference to the following: • composed of protein and RNA (1) • (arranged in) two {(sub) units / parts} (1)	**ACCEPT** large and small subunit / 60S and 40Ssubunit / 50S and 30S subunit	(2)
(ii)	An answer that makes reference to two of the following: • translation (1) • to hold the tRNA on the mRNA (1) • whilst peptide bonds form to join (adjacent) amino acids together(1)		(2)