

WJEC (Eduqas) Biology A-level
1.2: Cell Structure and
Organisation
Questions by Topic - Mark
Scheme

1.

Question		Marking details		Marks available					
				AO1	AO2	AO3	Total	Maths	Prac
1	(a)		A: Mitochondrion/mitochondria B: Golgi {body/complex/apparatus} C: Ribosome(s) D: Nuclear pore 2 or 3 correct for 1 mark All correct for 2 marks	2			2		
	(b)	(i)	Nucleus/ E: (contains DNA which) codes for the production of {proteins/polypeptides/sequence of amino acids in a polypeptide}/ transcription/ {pre-processing/ production/ synthesis} of mRNA (1) Nuclear pores/ D: allow {mRNA/rRNA} to leave the nucleus (1) Ribosome(s)/C: carry out translation/ protein synthesis/or description of (1)	3			3		
	(b)	(ii)	Any 3 × (1) from: Rough Endoplasmic Reticulum/ RER/ F: transports proteins {through the cell/ through the cytoplasm}/ transports proteins to golgi body/ package proteins into vesicles (1) Golgi body/ B: {Packaging/Modification} of protein/description of/ activation of enzyme (1) (transport) vesicle/ G: transports {proteins/enzymes} to the {cell membrane/ plasma membrane} (1) Exocytosis (of enzymes from the cell) (1)	3			3		
		(iii)	<u>Provide ATP :</u> {for transcription / translation / protein synthesis} (1) <u>exocytosis</u> (1)		2		2		
			Question 1 total	8	2	0	10	0	0

2.

Question			Marking details	Marks Available						
				S	AO1	AO2	AO3	Total	Maths	Prac
2	(a)		chloroplast/cellulose cell wall/starch grains = plant (1) flagellum/ small vacuoles/eyespot = animal (1) Not mitochondria (golgi body neutral)			2		2		
Question 2 total				0	0	2	0	2	0	0

3.

Question			Marking details	Marks available					
				AO1	AO2	AO3	Total	Maths	Prac
3	(a)		Correctly labelled lysosome (1) Golgi (apparatus/body) (1) Contain {hydrolytic/digestive} enzymes/{Break down/recycle} {organelles/macromolecules/debris}(1) Accept {transport/release} of enzymes <u>within cell</u> Reject disposal of waste unqualified/secrete enzymes	3			3		
Question 3 total				3	0	0	3	0	0

4.	Question	Marking details	Marks Available								
4	(a) (i) Cuboidal; Kidney tubule; Accept kidney/ liver/named gland/ureter/ovary/glands		2								
	(ii) Ciliated; NOT cilia Trachea / oviduct/fallopian tube/ bronchi/bronchioles;		2								
(b)	<table border="1"> <tr> <td>B</td> <td><i>nucleus</i></td> <td>contains <u>DNA</u> which {codes for/ controls} <u>protein synthesis</u>/ transcription/ <u>DNA</u> {synthesis/replication};</td> </tr> <tr> <td>C</td> <td><i>nuclear pores</i></td> <td>{Transport/movement} of {mRNA/ nucleot des/rRNA}; Accept ribosomes NOT transport of mRNA in</td> </tr> <tr> <td>D</td> <td>Nucleolus;</td> <td>Produces {rRNA/ribosomes/tRNA}; NOT produces RNA unqualified</td> </tr> </table>	B	<i>nucleus</i>	contains <u>DNA</u> which {codes for/ controls} <u>protein synthesis</u> / transcription/ <u>DNA</u> {synthesis/replication};	C	<i>nuclear pores</i>	{Transport/movement} of {mRNA/ nucleot des/rRNA}; Accept ribosomes NOT transport of mRNA in	D	Nucleolus;	Produces {rRNA/ribosomes/tRNA}; NOT produces RNA unqualified	4
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(c)	<table border="1"> <tr> <td>Organelle A</td> <td>Nucleus</td> </tr> <tr> <td><u>Inner</u> membrane is folded /</td> <td>No folding of <u>inner</u> membrane /</td> </tr> <tr> <td>Has cristae</td> <td>no cristae;</td> </tr> <tr> <td>No ribosomes attached</td> <td>ribosomes attached;</td> </tr> </table>	Organelle A	Nucleus	<u>Inner</u> membrane is folded /	No folding of <u>inner</u> membrane /	Has cristae	no cristae;	No ribosomes attached	ribosomes attached;	1	
Organelle A	Nucleus										
<u>Inner</u> membrane is folded /	No folding of <u>inner</u> membrane /										
Has cristae	no cristae;										
No ribosomes attached	ribosomes attached;										
	<i>must be comparative</i>										
(d)	Ribosomes are not attached to {membranes/ ER} in prokaryotes (some) are in animal cells; Ribosomes are {larger/80S} in animal cells than prokaryotes / 70S;		2								
	<i>must be comparative</i>										
Question 4 Total			[11]								

5.

Question			Marking details	Marks Available
5.	(a)	(i)	<p>A Mitochondrion/ mitochondria Plus ATP synthesis/aerobic respiration; NOT produce/ create energy</p> <p>B Golgi Body/ complex/ apparatus NOT golgi alone Plus one of</p> <ul style="list-style-type: none"> • Modification of {proteins/lipids}/ Addition of sugar chains/ produces glycoprotein • {Transport/storage} of {lipids/digestive enzymes} • Synthesis of {(secretory) vesicles/lysosomes}/ packaging proteins; <p>NOT transport(ation) of proteins/ synthesis of proteins</p>	2
		(ii)	Liver/muscle/nervous tissue/ meristem;	1
	(b)	<p>Nuclear pores + Allows {mRNA/ribosomal RNA/ribosomes} to <u>pass out/through</u> of nucleus; NOT substances</p> <p>Nucleolus + Synthesis of ribosome (components);</p> <p>(Double) nuclear membrane/nuclear envelope + Separates the DNA from the rest of the cellular contents/ holds DNA/ chromosomes;</p> <p>Chromatin+ condenses to form chromosomes/ {involved in/ code for} protein synthesis;</p> <p>Matched pair = 1 mark</p>	2	
(c)	<p>D presence of ribosomes + no ribosomes on E; D {<u>membranes/ cisternae</u>} in <u>parallel/regular lines/</u> more organised + {open network of <u>membranes/ cisternae</u>}/ less organised/ or description in E;</p> <p>Question 5 Total</p>	2		
				[7]

6.

Question

Marking details

Marks Available

6 (a)

Organelle	Name	Function
K	nucleus;	contains <u>DNA</u> which {codes for / controls} <u>protein synthesis</u> ;
L	ribosomes ;	synthesise proteins;
M	Golgi apparatus/body;	packaging of proteins (for secretion from the cell) / (chemically) modifies proteins / produces glycoproteins / produces lysosomes;

6

(b) (i) They have been cut in different plane/ angle;

1

(ii) (Loop of) DNA;
(70S) ribosomes;
Both possess plasma membranes; NOT double membrane

Max 2

(iii) Mitochondria: (statements should be comparative)

Max 2

Has a double membrane;
No cell wall;
No capsule;
No flagellum/ pili;
No mesosome;
No plasmids;

Question 6 Total

[11]

7.	(a)	A = matrix; B = crista/internal membrane;	2
	(b)	E is the site of protein synthesis; Polypeptide chains build up at ribosome; transports polypeptides/proteins; ribosomes read genetic code (allow: receive mRNA);	2 max
		F buds off vesicles/package proteins into vesicles; these contain molecules for secretion; transport protein molecules to cell surface/membrane; synthesis of glycoproteins/modification of proteins;	2 max
	(c)	secretory cell involved in active processes/metabolically active; ATP/energy dependent; ATP manufactured by C; hormone synthesis requires ATP;	2 max
	(d)	cut in different plane/AW;	1
			(Total 9 marks)

8. (a) (i) Mitochondrion/ mitochondria 1
- (ii) Respiration/ aerobic respiration 1
 stores {energy/ ATP}/ release energy/ {synthesis/produce 1
 ATP}/ release energy / ATP for respiration =2 marks NOT
 production of energy
- (iii) muscle / liver/ epithelial cells of small intestine / cells of 1
 proximal convoluted tubule/ neurones/ companion cells/
 sperm/ secretary cells NOT muscle tissue/ the liver/ cardiac
 tissue
- (b) A 1
- (c) allows transport of { messenger/ mRNA}/ nucleotides/ 1
 ribosomes NOT out and in

(Total 6 marks)

9. (a) (i) mitochondrion; [1]
- (ii) aerobic respiration / production / manufacture of ATP; [1]
(not: make ATP for respiration)
- (ii) A = cristae; [2]
B = matrix;
- (b) metabolically active/ many chemical reactions or specified eg active transport [2]
large amount of ATP produced/required;

(Total 6 Marks)