

**WJEC (Wales) Biology A-level**  
**Topic 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)		<b>Any 3 × (1) from:</b>  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)		Provide ATP : {for transcription / translation / protein synthesis} (1) <u>exocytosis</u> (1)		2		2		
				<b>Question 1 total</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>

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		
<b>Question 2 total</b>				<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>

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		
<b>Question 3 total</b>				<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>

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>nucleus</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>nuclear pores</td> <td>{Transport/movement} of {mRNA/ nucleotides/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	nucleus	contains <u>DNA</u> which {codes for/ controls} <u>protein synthesis</u> / transcription/ <u>DNA</u> {synthesis/replication};	C	nuclear pores	{Transport/movement} of {mRNA/ nucleotides/rRNA}; Accept ribosomes NOT transport of mRNA in	D	Nucleolus;	Produces {rRNA/ribosomes/tRNA}; NOT produces RNA unqualified	4
B	nucleus	contains <u>DNA</u> which {codes for/ controls} <u>protein synthesis</u> / transcription/ <u>DNA</u> {synthesis/replication};										
C	nuclear pores	{Transport/movement} of {mRNA/ nucleotides/rRNA}; Accept ribosomes NOT transport of mRNA in										
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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> <p><i>must be comparative</i></p>	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;											
	(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; <i>must be comparative</i>	2									
<b>Question 4 Total</b>			<b>[11]</b>									

5.

Question			Marking details	Marks Available
5.	(a)	(i)	<p>A Mitochondrion/ mitochondria  <b>Plus</b>            ATP synthesis/aerobic respiration;            NOT produce/ create energy</p> <p>B Golgi Body/ complex/ apparatus NOT golgi alone  <b>Plus one of</b></p> <ul style="list-style-type: none"> <li>• Modification of {proteins/lipids}/ Addition of sugar chains/ produces glycoprotein</li> <li>• {Transport/storage} of {lipids/digestive enzymes}</li> <li>• Synthesis of {(secretory) vesicles/lysosomes}/ packaging proteins;</li> </ul> <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><b>Matched pair = 1 mark</b></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><b>Question 5 Total</b></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)

Has a double membrane;

No cell wall;

No capsule;

No flagellum/ pili;

No mesosome;

No plasmids;

Max 2

**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)**