

Cell Organelles - Mark Scheme

Q1.

Question Number	Acceptable Answer	Additional Guidance	Mark
(i)	<ul style="list-style-type: none"> • correct readings from x axis (1) • correct answer using appropriate units (au min⁻¹) (1) 	<u>Example of calculation</u> $52 - 25 = 27$ $27 \div 13 = 2.1 \text{ au min}^{-1}$	(2)

Question Number	Acceptable Answer	Additional Guidance	Mark
(ii)	<ul style="list-style-type: none"> • correct description of route taken by labelled amino acids from rER to Golgi apparatus to secretory vesicles (1) <p>An explanation that makes reference to three of the following:</p> <ul style="list-style-type: none"> • amino acids incorporated into { polypeptides / proteins } on the rER (1) • proteins transferred from rER to Golgi apparatus in (transport) vesicles (1) • proteins modified inside the Golgi apparatus (1) • packaged into secretory vesicles by the Golgi apparatus (1) 		(4)

Q2.

Question Number	Answer	Additional guidance	Mark
(a)	<ol style="list-style-type: none"> presence of { membrane bound / named membrane bound } organelle in eukaryotic cells / eq ; presence of { plasmids / slime capsule / pili / eq} in prokaryotic cells ; size of ribosomes i.e. larger in eukaryotic cells / 70S in prokaryotes and 80S in eukaryotes / eq ; DNA in a nucleus in eukaryotic cells /eq ; { DNA / chromosome } linear in eukaryotic cells and circular in prokaryotic cells / eq ; relevant comment regarding cell walls e.g. cell walls always present in prokaryotic cells, only in some eukaryotic cells; 	<p>ACCEPT converse where appropriate</p> <ol style="list-style-type: none"> ACCEPT reference to a named organelle such as mitochondria or nucleus present in eukaryotic cells and NOT in prokaryotic cells ACCEPT reference to mesosomes cell walls in prokaryotic cells contain{ peptidoglycan / murein} and in eukaryotic cells they contain {cellulose /chitin } 	(3)

Question Number	Answer	Additional guidance	Mark
(b)	<ol style="list-style-type: none"> idea of molecular { differences / similarities } ; in { DNA / RNA } ; in proteins / proteomics ; idea of (evolutionary) relationships between organisms ; 	<ol style="list-style-type: none"> ACCEPT base sequences ACCEPT amino acid sequences ACCEPT idea of closely related species 	(3)

Question Number	Answer	Additional guidance	Mark
(c)(i)	1. idea of cell membrane being different ; 2. idea of different number of protein molecules ;	1. ACCEPT description of difference e.g. ether bonds, branched hydrocarbons 2. ACCEPT NOT same number, they have 10 protein molecules	(2)

Question Number	Answer	Additional guidance	Mark
(c)(ii)	1. number of protein molecules is closer to Eukaryota than to Bacteria / eq ; 2. no peptidoglycan in cell wall ;		(2)

Q3.

Question Number	Answer	Additional Guidance	Mark
	A description which makes reference to the following: <ul style="list-style-type: none"> • {vesicles fuse with / protein enters} Golgi apparatus (1) • modification of protein inside Golgi apparatus (1) • {protein / enzyme} packaged into (secretory) vesicles (1) • vesicles fuse with cell (surface) membrane (1) 		(4)

Q4.

Question Number	Answer	Additional Comments	Mark
(a)	C ;		(1)

Question Number	Answer	Additional Comments	Mark
(b)	D ;		(1)

Question Number	Answer	Additional Comments	Mark
(c)	A ;		(1)

Question Number	Answer	Additional Comments	Mark
(d)	D ;		(1)

Question Number	Answer	Additional Comments	Mark
(e)	C ;		(1)

Question Number	Answer	Additional Comments	Mark
(f)	D ;		(1)

Question Number	Answer	Additional Comments	Mark
(g)	D ;		(1)

Question Number	Answer	Additional Comments	Mark
(h)	C ;		(1)

Q5.

Question Number	Answer	Additional Guidance	Mark
(i)	A (K)		(1)

Question Number	Acceptable Answer	Additional Guidance	Mark
(ii)	C (M)		(1)

Question Number	Acceptable Answer	Additional Guidance	Mark
(iii)	D (N)		(1)

Question Number	Acceptable Answer	Additional Guidance	Mark
(iv)	<ul style="list-style-type: none"> measures width on diagram (1) correct answer (1) 	<p><u>Example of calculation</u> $(500 \times \text{width of K}) \div \text{length of bar}$ $= 940 \text{ nm}$</p> <p>Allow full marks for correct answer with no working</p>	(2)

Q6.

Question Number	Acceptable Answer	Additional Guidance	Mark
	<p>A description that makes reference to the following:</p> <ul style="list-style-type: none"> double membrane / envelope (1) nuclear pores (1) nucleolus (1) 		(3)

Q7.

Question Number	Answer	Additional Guidance	Mark															
	<table border="1"> <thead> <tr> <th>Organelles</th> <th>Prokaryotic cell</th> <th>Eukaryotic cell</th> </tr> </thead> <tbody> <tr> <td>centrioles</td> <td>x</td> <td>✓</td> </tr> <tr> <td>flagella</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Golgi apparatus</td> <td>x</td> <td>✓</td> </tr> <tr> <td>ribosomes</td> <td>✓</td> <td>✓</td> </tr> </tbody> </table> <p>1 mark for any two correctly completed boxes ;</p>	Organelles	Prokaryotic cell	Eukaryotic cell	centrioles	x	✓	flagella	✓	✓	Golgi apparatus	x	✓	ribosomes	✓	✓	Blanks are incorrect Composite tick and cross are incorrect unless clearly replaced	(4)
Organelles	Prokaryotic cell	Eukaryotic cell																
centrioles	x	✓																
flagella	✓	✓																
Golgi apparatus	x	✓																
ribosomes	✓	✓																