# WJEC (Eduqas) Biology A-level Core Concept 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<br>B: Golgi {body/complex/apparatus}<br>C: Ribosome(s)<br>D: Nuclear pore<br>2 or 3 correct for 1 mark<br>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)<br>Nuclear pores/ D: allow {mRNA/rRNA} to leave the nucleus (1)<br>Ribosome(s)/C: carry out translation/ protein synthesis/or description of (1) | 3 | | | 3 | | |
| | (b) | (ii) | | **Any 3 × (1) from:**<br>Rough Endoplasmic Reticulum/ RER/ F: transports proteins {through the cell/ through the cytoplasm}/ transports proteins to golgi body/ package proteins into vesicles (1)<br>Golgi body/ B: {Packaging/Modification} of protein/description of/ activation of enzyme (1)<br>(transport) vesicle/ G: transports {proteins/enzymes} to the {cell membrane/ plasma membrane} (1)<br>Exocytosis (of enzymes from the cell) (1) | 3 | | | 3 | | |
| | | (iii) | | Provide ATP :<br>{for transcription / translation / protein synthesis} (1)<br>exocytosis (1) | | 2 | | 2 | | |
| | | | | **Question 1 total** | **8** | **2** | **0** | **10** | **0** | **0** |

**2.**

| Question | | | | Marking details | S | Marks Available | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | AO1 | AO2 | AO3 | Total | Maths | Prac |
| 2 | (a) | | | chloroplast/cellulose cell wall/starch grains = plant (1)<br>flagellum/ small vacuoles/eyespot = animal (1)<br>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)<br>Golgi (apparatus/body) (1)<br>Contain {hydrolytic/digestive} enzymes/{Break down/recycle} {organelles/macromolecules/debris}(1)<br>Accept {transport/release} of enzymes within cell<br>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;<br>Kidney tubule;<br>Accept kidney/ liver/named gland/ureter/ovary/glands | 2 |
| | | (ii) | Ciliated;NOT cilia<br>Trachea / oviduct/fallopian tube/ bronchi/bronchioles; | 2 |
| | (b) | | | 4 |

| | | |
|---|---|---|
| B | *nucleus* | contains DNA which {codes for/ controls} protein synthesis/ transcription/ DNA {synthesis/replication}; |
| C | *nuclear pores* | {Transport/movement} of {mRNA/ nucleotides/rRNA};<br>Accept ribosomes<br>NOT transport of mRNA in |
| D | Nucleolus; | Produces {rRNA/ribosomes/tRNA};<br>NOT produces RNA unqualified |

(c) 1

| Organelle A | Nucleus |
|---|---|
| Inner membrane is folded /<br>Has cristae | No folding of inner membrane /<br>no cristae; |
| No ribosomes attached | ribosomes attached; |

*must be comparative*

(d) Ribosomes are not attached to {membranes/ ER} in prokaryotes (some) are in animal cells; 2
Ribosomes are {larger/80S} in animal cells than prokaryotes / 70S;
*must be comparative*

**Question 4 Total [11]**

**5.**

| Question | | | Marking details | Marks Available |
|---|---|---|---|---|
| **5.** | (a) | (i) | A Mitochondrion/ mitochondria<br>**Plus**<br>ATP synthesis/aerobic respiration;<br>NOT produce/ create energy | 2 |
| | | | B Golgi Body/ complex/ apparatus NOT golgi alone<br>**Plus one of**<br>• Modification of {proteins/lipids}/ Addition of sugar chains/ produces glycoprotein<br>• {Transport/storage} of {lipids/digestive enzymes}<br>• Synthesis of {(secretory) vesicles/lysosomes}/ packaging proteins;<br>NOT transport(ation) of proteins/ synthesis of proteins | |
| | | (ii) | Liver/muscle/nervous tissue/ meristem; | 1 |
| | (b) | | Nuclear pores +<br>Allows {mRNA/ribosomal RNA/ribosomes} to pass out/through of nucleus; NOT substances | 2 |
| | | | Nucleolus +<br>Synthesis of ribosome (components); | |
| | | | (Double) nuclear membrane/nuclear envelope +<br>Separates the DNA from the rest of the cellular contents/ holds DNA/ chromosomes; | |
| | | | Chromatin+<br>condenses to form chromosomes/ {involved in/ code for} protein synthesis;<br>**Matched pair = 1 mark** | |
| | (c) | | D presence of ribosomes + no ribosomes on E;<br>D {membranes/ cisternae} in parallel/regular lines/ more organised + {open network of membranes/ cisternae}/ less organised/ or description in E; | 2 |
| | | | **Question 5 Total** | **[7]** |

**6.**

| Question | | Marking details | Marks Available |
|---|---|---|---|

**6** *(a)*

| Organelle | Name | Function |
|---|---|---|
| K | nucleus; | contains DNA which {codes for / controls} protein synthesis; |
| 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; Max 2
(70S) ribosomes;
Both possess plasma membranes; NOT double membrane

(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 ATP}/ release energy / ATP for respiration =2 marks NOT production of energy | | 1 |
| (iii) | muscle / liver/ epithelial cells of small intestine / cells of proximal convoluted tubule/ neurones/ companion cells/ sperm/ secretary cells NOT muscle tissue/ the liver/ cardiac tissue | | 1 |
| (b) | A | | 1 |
| (c) | allows transport of { messenger/ mRNA}/ nucleotides/ ribosomes NOT out and in | | 1 |

**(Total 6 marks)**

**9.** (a) (i) mitochondrion; **[1]**

(ii) aerobic respiration / production / manufacture of ATP; **[1]**
(not: make ATP for respiration)

(ii) A = cristae;
B = matrix; **[2]**

(b) metabolically active/ many chemical reactions or specified eg active transport
large amount of ATP produced/required; **[2]**

**(Total 6 Marks)**