

A-Level Biology

Name: _____ Score: _____

1. Why does an electron microscope have a much higher resolution than a light microscope?
 - ☐ electrons have a much shorter wavelength than light
 - ☐ electrons are bigger than light
 - ☐ it uses more lenses
 - ☐ it magnifies more times
2. What is the main function of mitochondria?
 - ☐ respiration — releasing energy as ATP
 - ☐ photosynthesis
 - ☐ making lipids
 - ☐ storing water
3. A key feature of a prokaryotic cell is that it:
 - ☐ has no nucleus — its circular DNA lies free in the cytoplasm
 - ☐ has a nucleus holding linear DNA
 - ☐ contains many mitochondria
 - ☐ is larger than a eukaryotic cell
4. Which equation gives magnification?
 - ☐ image size $\div$ actual size
 - ☐ actual size $\div$ image size
 - ☐ image size $\times$ actual size
 - ☐ image size $+$ actual size
5. The tiny organelle that joins amino acids to build proteins is the _____.

6. Prokaryotes have smaller 70S ribosomes, while the cytoplasm of eukaryotes has larger 80S ribosomes.
 - ☐ True ☐ False
7. How many micrometres (μm) are in 1 mm?
_____ μm

8. Rough ER is studded with ribosomes and makes proteins, while smooth ER has none and makes lipids.

☐ True ☐ False

9. The small extra ring of DNA in a bacterium, separate from its main loop, is a _____.

10. At magnification $\times 5000$, a structure measures 25 mm in the image. What is its actual size, in μm ?

_____ μm

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1. **electrons have a much shorter wavelength than light**

Shorter wavelength $\rightarrow$ higher resolution, so finer detail can be seen.

2. **respiration — releasing energy as ATP**

Mitochondria are the site of aerobic respiration, producing ATP.

3. **has no nucleus — its circular DNA lies free in the cytoplasm**

Prokaryotes have no nucleus and no double-membrane organelles; their DNA is circular and free.

4. **image size $\div$ actual size**

Magnification = size of image $\div$ actual size (no units).

5. **ribosome**

Ribosomes carry out protein synthesis; the nucleolus makes them.

6. **True**

Correct — 70S in prokaryotes; 80S in eukaryotic cytoplasm (mitochondria and chloroplasts contain 70S, a clue to their origin).

7. **1000 μm**

1 mm = 1000 μm (and 1 μm = 1000 nm).

8. **True**

Correct — the "rough" look is the ribosomes on the rough ER, which make proteins; smooth ER makes lipids.

9. **plasmid**

Plasmids carry extra genes (e.g. antibiotic resistance) and can be passed between bacteria.

10. **5 μm**

25 mm $\div$ 5000 = 0.005 mm = 5 μm .