

Model Answers: Easy

1

The correct answer is **B** because:

- Animal cells do not have a cell wall, but all cells have a membrane
- Animal and bacterium cells have DNA; the DNA in an animal cell will have a linear structure and be found in the nucleus, in a bacterium it is circular and found in a region of the cytoplasm
- All cells need to synthesise proteins, so both have ribosomes

A is incorrect as animal cells do not have a cell wall.

C & D are incorrect as animal cells do not have a capsule.

All cellular life contains genetic material in the form of DNA, ribosomes to synthesise proteins and the contents of all cells are enclosed within a cell membrane. The ribosomes found in bacterial (prokaryotic) cells are smaller than those found in animal (eukaryotic) cells.

2

The correct answer is **C** because:

- Eukaryotic cells have their DNA packaged in linear chromosomes which are found in the nucleus
- The ribosomes in a eukaryotic cell are 80S ribosomes, they are typically large and able to form more complex proteins

A & B are incorrect as eukaryotic cells do not have circular DNA.

D is incorrect as the ribosomes in prokaryotic cells are smaller, referred to as 70S ribosomes.

The 'S' stands for Svedberg unit; this is a measure of particle size based on the rate of travel of a particle in a tube that is subjected to a high g-force! 70S ribosomes are smaller than 80S ribosomes.

3

The correct answer is **A** because the nucleolus, a region of the nucleus, is where ribosomal subunits are made from ribosomal RNA (rRNA) and proteins. Ribosomes are made from a large subunit (60S in eukaryotes, 50S in prokaryotes) and a smaller subunit (40S and 30S in eukaryotes and prokaryotes respectively)

B is incorrect as the synthesis of ribosomal proteins takes place in the cytoplasm.

C is incorrect as this process occurs during cell division.

D is incorrect as the rough endoplasmic reticulum is continuous with the nuclear envelope.

4

The correct answer is **C** because:

- The structure is the rough endoplasmic reticulum (RER)
- The function of the rough endoplasmic reticulum is to synthesise proteins as it has ribosomes attached to the surface
- Proteins that will be secreted by the cell tend to be synthesised by ribosomes on the RER; they pass directly into the compartmentalised ER where they may be modified before being packaged into vesicles and transported to the Golgi apparatus where they are further processed before secretion.

A is incorrect as this is a vesicle which will fuse with the surface membrane to secrete its contents by exocytosis.

B is incorrect as this is the Golgi apparatus, which is involved in processing and modifying

proteins but not in making them.

D is incorrect as this is a mitochondrion, the site of aerobic respiration.

5

The correct answer is **D** because having circular DNA is the only feature that is only seen in prokaryotes.

All the other features can be seen in different types of eukaryotic organisms.

6

The correct answer is **B** because:

- The structure highlighted is the rough endoplasmic reticulum (RER)
- The function of the rough endoplasmic reticulum is to synthesise proteins that usually will be exported from the cell or those that need modifying before working internally
- The RER has ribosomes attached to its endoplasmic reticulum surface, which synthesise proteins that then enter the internal space of the ER to be modified/transported.

A is incorrect as the rough endoplasmic reticulum is also involved in the transport of proteins.

C & D are incorrect as the function of the smooth ER is to synthesise, process and transport lipids.

7

The correct answer is **C** because the function of a ribosome is protein synthesis; all prokaryotic and eukaryotic cells need to produce proteins so all cells have them!

The other structures may be present in prokaryotic cells, but they are not always found in prokaryotic cells.

8

The correct answer is **B** because:

- Centrioles are not present in most flowering plant cells
- Cilia are hair-like structures found on some epithelial cells in animals
- Plants do have mitochondria for aerobic respiration
- Plants have a permanent vacuole to store sap

Most eukaryotic cells do have centrioles (which play a vital role in cell division) but they are not found in flowering plant, conifers or fungi.

9

The correct answer is **C** because the function of the **smooth endoplasmic reticulum** is for steroid, lipid and carbohydrate production, processing and storage.

A is incorrect as **enzymes** are **proteins**. Proteins are synthesised by the **ribosomes**.

B is incorrect as proteins are synthesised by the **ribosomes**.

D is incorrect as **antibodies** are part of the immune system and made by specialised cells; they are proteins...so they are also synthesised by the ribosomes!

10

The correct answer is **A** because:

- **Chromatin** is the substance that makes up chromosomes in eukaryotic cells.
- It is a complex of DNA and **histones** proteins; it primarily allows long DNA molecules to be packaged into more compact and dense structures

- Prokaryotic cells have very different structures for organising their **chromosomes**, which are circular and therefore closed structures (unlike linear chromosomes in eukaryotes which have terminal ends)

B is incorrect as prokaryotic cells can have cell walls made from peptidoglycan (which is also known as murein).

C is incorrect as prokaryotic cells may have one or more plasmids.

D is incorrect as prokaryotic cells have 70S ribosomes.