Edexcel AS Biology B exam practice answers

2 Cells, viruses and reproduction of living things

**1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Feature** | **Animal cell** | **Bacterial cell** | **Plant cell** |
| Cell wall | ✘ | 3 | 3 |
| Cell-surface membrane | 3 | 3 | 3 |
| Chloroplast | ✘ | ✘ | 3 |
| Mitochondria | 3 | ✘ | 3 |
| Nucleoid | ✘ | 3 | ✘ |
| Tonoplast | ✘ | ✘ | 3 |

[6]

**2 (a) D**, **C**, **B**, **E**. [1]

 **(b)** Mitosis; only the sister chromatids are separated/homologous chromosomes. [2]

 **(c)** It holds the sister chromatids together; it attaches to the spindle fibres. [2]

**3 (a)** It shows the ultrastructure/it shows (any named) organelles not visible with a light microscope. [1]

 **(b)** Mitochondrion. [1]

 **(c)** They are cut at different angles. [1]

 **(d)** Enzymes are proteins; rough endoplasmic reticulum/ribosomes produces proteins; Golgi apparatus packages proteins for secretion. [3]

 **(e)** The correct measurement of diameter of **X**; correct use of formula:

 M$agnification=\frac{size of image in μm}{1.2}$ [2]

**4 (a)** 5 cm3 of the 20% solution in 15 cm3 water. [1]

 **(b)** The values are all whole numbers/there are no decimal fractions; this is unlikely when finding eight means each of 100 measurements. [2]

 **(c)** A suitable graph would show: ‘Concentration of sucrose/%’ on the *x*-axis and ‘Mean length of pollen tube/μm’ on the *y*-axis; break in *y*-axis/values start at 230 μm; values plotted correctly either as a line graph or a bar chart; the points should be joined together (if a line graph)/the bars should not touch (if a bar chart). [4]

 **(d)** As sucrose concentration increases, pollen length of cherry increases then falls; with maximum at 15% sucrose solution; sucrose concentration has little effect on pollen tube growth in apricot/length stable. [3]

**5 (a) (i)** Red blood cells lose their nucleus as they mature/as they differentiate. [1]

 **(ii)** Germinal epithelial cell in the G2 phase of the cell cycle = 72; sperm cell = 18; primary oocyte = 36. [3]

 **(b)** A good answer will include any six of the following points (6 marks maximum):

* Homologous chromosomes carry the same genes in the same order.
* DNA replication produces identical (sister) chromatids.
* In mitosis, one chromatid from every chromosome is present in each new nucleus.
* In mitosis, no pairing of homologous chromosomes occurs.
* So (in mitosis) no chiasmata are formed/no crossing over occurs.
* In anaphase I of meiosis, homologous chromosomes are separated.
* Separation of chromosomes in each homologous pair is random [6]

**6 (a) (i)** It possesses DNA. [1]

 **(ii)** It lacks cytoplasm/cell-surface membrane/ribosomes. [1]

 **(b)** Any four from:

* Phage attaches to bacterium and injects its own DNA.
* Bacterial DNA broken down.
* Bacteria replicate phage DNA.
* Bacteria produce phage mRNA/produce phage protein.
* Bacterial cell bursts and new phage particles are released. [4]

 **(c) (i)** Phosphorus in DNA; sulfur in protein. [2]

 **(ii)** The protein coat remains outside the bacterium; DNA is injected into the bacterium. [2]