# AQA Biology Practice Papers Answers

## Paper 1

**1.1 a** A - Cell wall; B - Cell membrane; C - Chloroplast; D - Nucleus.

**b** Electron microscope.

**c** 25 000 µm/10 µm = × 2500

**1.2 a** Differentiation

**b** *Any two from*: Has chloroplasts; Has a cellulose cell wall; Has a permanent vacuole.

**1.3 a** **i** Number of cells in mitosis.

**ii** Root tip treatment.

**b** 3; 47.

**c** **i** The root tip treated with paclitaxel had fewer cells in mitosis than the cells not treated with paclitaxel; The cells treated with paclitaxel had a very low number of cells in mitosis.

**ii** Paclitaxel could inhibit/prevent mitosis.

**iii** To make the results more reliable.

**iv** Treat the root tip with different concentrations of paclitaxel; Treat a greater number of onion roots.

**2.1 a** ((5.0 – 4.4) ÷ 5.0) × 100% = 12%

**b** The water in the potato is more dilute than the water in the salt solution; so the water moves out of the potato cells and into the salt solution.

**2.2 a** **i** C

**ii** Solution C contains sugar and protein; Milk contains lactose and milk proteins.

**b** Long term energy storage.

**c** Carbohydrase

**d** Starch → glucose

**2.3 a** Pulmonary artery

**b** The lungs

**c** The blood is pumped from the heart to the lungs to be oxygenated; and then back through the heart to be pumped around the body.

**d** There needs to be time for the ventricles to fill with blood; otherwise the ventricles will contract while empty.

**2.4 a** The heart/cardiac muscle will not receive enough oxygen; The person will have a heart attack.

**b** Stent/statins.

**c** *Any two from*: Diet; Smoking; Lack of exercise; Obesity.

**3.1 a** *Any three from*: Bacteria do not have a nucleus; Bacteria do not have organelles; The DNA in bacteria is a single loop in the cytoplasm; Bacteria have plasmids; Bacteria are smaller than eukaryotic cells.

**b** Antibiotics

**3.2 a** There were fewer incidences of tuberculosis in 2015 compared to 2010.

**b** A small amount of dead virus/ antigen is introduced to the body; which triggers an immune response by the lymphocytes; The virus/ antigen is remembered by memory cells if the same virus infects the body again.

**c** There would be herd immunity; Enough people would be immune to tuberculosis so it could not easily spread through the population; People who were not vaccinated would be protected from infection with tuberculosis.

**3.3 a** In plants/microorganisms; development of existing drugs.

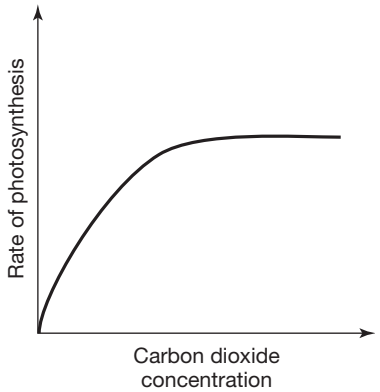
**b** Preclinical testing tests new drug on cells in a laboratory; The new drug is tested for toxicity/efficacy/dose; If the drug is not toxic and effective it goes to clinical trials, where a very low dosage of the new drug is given to healthy volunteers and patients; If the drug is safe, it moves to further clinical trials where different doses of the new drug are given to healthy volunteers and patients to find the optimum dose for the drug; The new drug then goes to wider clinical trials where the new drug is given to patients; The results of clinical trials are peer reviewed and published in scientific or medical journals.

**4.1 a**

| Distance of lamp from pondweed (cm) | Volume of oxygen collected in 5 minutes ($cm^3$) | Rate of reaction ($cm^3$/min) |
|---|---|---|
| 0 | 15.0 | 3.0 |
| 20 | 12.5 | **2.5** |
| 40 | 6.5 | **1.3** |
| 60 | 6.0 | **1.2** |
| 80 | 6.0 | **1.2** |

**b** (cm) added to column header in first column; .0 added to 6 in column 2, row 4 (added to table above).

**4.2 a**




**b** As the carbon dioxide concentration increases, the rate of reaction increases; until a limiting factor prevents the rate of reaction increasing, and the rate of reaction remains constant.

**H c** Line drawn onto graph that extends the original steep line; the rate becomes constant above the original line.

## Paper 2

**1.1 a** Fast; automatic / involuntary reaction.

**b** Sensory neurone → relay neurone → motor neurone

**1.2 a** A system of glands and organs; that produce hormones.

**b** Ovaries

**c** *Any two from*: Repairs the lining of the uterus after menstruation; Slows down the production of follicle-stimulating hormone so that only one ovum reaches full maturity; Stimulates the pituitary gland to release luteinising hormone.

**d** Intrauterine implant.

**1.3 a**

| Type of contraception | Number of pregnancies per 1000 | Percentage of pregnancies prevented (%) |
|---|---|---|
| Condoms | 30 | 97.0 |
| Spermicides | 40 | **96.0** |
| Contraceptive pill | 1 | **99.9** |
| Intrauterine device | 2 | **99.8** |

**b** Contraceptive pill.

**H c** IVF is a type of fertilisation that happens outside of the body; Eggs are surgically removed from the mother and fertilised by the father's sperm in a laboratory; The fertilised eggs develop into embryos and are are then placed surgically into the woman's uterus.

**H d** Advantage. *One* from: It allows the mother to give birth to her own baby; The baby will be the genetic offspring of the mother and father.
Disadvantage. *One* from: The success rate is not high; It can lead to multiple births which is less safe for the mother and babies; Emotionally/physically stressful.

**2.1 a** Nucleus

**b** 23

**2.2 a** Recessive: The phenotype is only expressed if there are no dominant alleles.

Dominant: The phenotype is always expressed.

**b** **i** 3
**ii** 1
**iii** 25%

**c** **i** Tt
**ii** 100%

**2.3 a** Charles Darwin; Alfred Russel Wallace.

**b** Within any population there is **variation**; Some individuals have

characteristics that are better **adapted** to the environment and are more likely to survive; These individuals are more likely to have **offspring** and pass on those characteristics.

**c** **i** All are segmented; all have two antennae.

**ii** Helmetiids and tegopeltids.

**2.4 a** Class – Amphibian; Genus – Bufo.

**b** *Any one from*: Frog, newt, salamander; any amphibian.

**c** The name contains the genus and species name; Binomial names prevent confusion when identifying species.

**3.1 a** *Any two from*: Potassium; Phosphorus; Nitrogen.

**b** The carbon is in the leaves is eaten by decomposers; Decomposers respire; and breathe out carbon dioxide into the atmosphere; The carbon dioxide is taken up by the carrots for photosynthesis; Photosynthesis produces sugars; which are used in respiration by the plant to provide energy for growth.

**3.2 a** A group of populations living and interacting with each other in the same area.

**b** Oak tree → caterpillars → blackbirds → sparrowhawk

**c** Caterpillars

**d** Oak tree

**e** Pyramid with bars drawn to scale for each species; from top to bottom: sparrowhawk, blackbird, caterpillars, oak tree.

**3.3 a** A few days; To give the woodlice time to mingle with the population; To give the woodlice time to move around; To allow time for migration.

**b** **i** Dark and damp – $(80 \times 88) \div 40 = 176$;
Light and dry – $(10 \times 7) \div 2 = 35$

**ii** Woodlice prefer to live in dark and damp conditions.

**3.4 a** From 1800 to 1930 the human population increases slowly, and after 1950, the human population increases steeply; From 1800 to 1930 the number of extinctions remained steady, but after 1930 the number of extinctions increases steeply.

**b** The industrial revolution used coal to fuel the trains and factories; which increases the amount of carbon dioxide in the atmosphere; This increases global warming; Global warming causes climate change; The industrial revolution increased the level of pollution in the air.