OCR AS/A-level Year 1 Biology A exam practice answers

**5 Enzymes**

**1 (a) (i)** The presence of starch (amylose). [1]

 **(ii)** That no starch is present. [1]

 **(b)** The reaction is rapid and all the starch has been digested. [2]

 **(c)** The temperature is low. The molecules have little kinetic energy. There are few collisions between substrate and enzyme molecules. The reaction rate is low — there is still some starch left after 7 minutes. [3]

 **(d)** The temperature is too high. The enzyme molecules vibrate and bonds within the molecules are broken. The active site changes shape and the starch no longer fits in the active site. The amylase is denatured. [4]

 **(e)** One from: stagger the readings; do one temperature at a time. [1]

 **(f)** The student tested only four temperatures — the true optimum may be lower or higher than 40°C. She should test a narrower range of temperatures around 40°C and carry out tests at more intermediate temperatures (between 20°C and 70°C). [3]

**2 (a)** A substance that increases the rate of reaction in a biological system. [2]

 **(b)** Starch consists of amylose and amylopectin. Amylose is converted to maltose, which must then be converted to glucose. Each substrate needs a different enzyme as enzymes are specific. The amino acid sequence of an enzyme produces a specific shape for the molecule. The active site of the enzyme must be specific to the substrate. The active site has a shape that is complementary to the shape of the substrate. [7]

**3 (a) (i)** Cofactor. [1]

 **(ii)** They fit into a specific site on the enzyme molecules (possibly the active site), activating the enzyme. [2]

 **(b)** heat: *temperature*

 highest: *optimum*

 killed: *denatured*

 key: *active* [4]