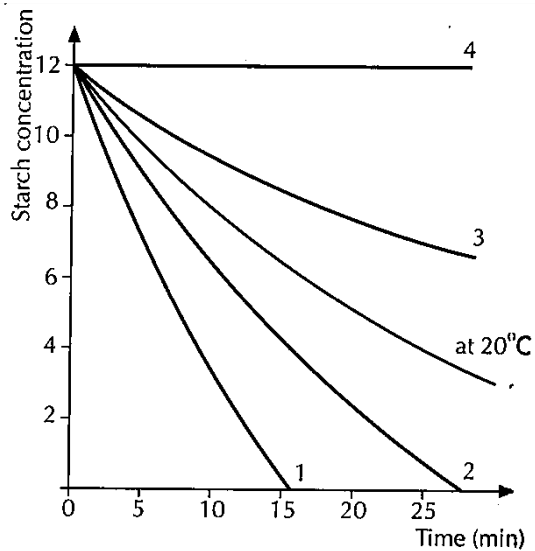


MARKING SCHEME FOR EXERCISES - "ENZYMES & FACTORS AFFECTING ITS ACTIVITY"

1. a) i) As the substrate concentration increases, the rate of reaction increases. (1m)
- ii) After some time, all the active sites of the enzymes are saturated (*meaning that, all the active sites are occupied by substrates*). Enzyme concentration becomes limiting factor. (1m) Therefore, the rate of reaction remains constant even when more substrates are added. (1m)
- b) i) A: 1, B: 6.5, C: 8 (3m)
- ii) A (1m)
- iii) The presence of hydrochloric acid (1m) lowers the pH in the stomach. This provides a conducive (*favorable/advantageous*) environment for the enzyme to work in. (1m)
2. a) Stage 1: The food particle is the substrate. It comes into contact with the enzyme. (1m)
- Stage 2: The substrate fits into the active site of the enzyme. (1m) This resembles a lock and a key. An enzyme-substrate complex is formed. (1m)
- Stage 3: The enzyme helps to break down the food particle. The products no longer fit into the active site of the enzyme. (1m) The enzyme remains unchanged at the end of the reaction. It is now free to interact with other substrates. (1m)
- b) Extreme temperature OR extreme pH (1m for any correct answer)
- c) The active site of the enzyme changes in shape. Substrates no longer fit into the active site. (1m) The enzyme is said to be denatured. (1m)
3. a) An enzyme is a biological catalyst which helps to speed up reactions. It is made of protein. (1m)
- b) Stains would be removed faster at 30°C. (1m) This is because enzyme reactions speed up as temperature increases. (1m)
- c) Less likely. (1m) enzymes are denatured at high temperatures. (1m)
4. a) Flask P: Curve 1
Flask Q: Curve 2
Flask R: Curve 4
Flask S: Curve 3 (2m)
- b) i) Curve 4 (1m)
- ii) Salivary amylase was denatured in both cases. (1m) The pH in flask E is unsuitable for the enzyme to work in. (1m)



c)

5. a) i) Pineapple juice digests gelatin/protein into peptones/amino acids. **(1m)**

ii) Y is protein in nature. (It contains carbon, hydrogen, oxygen and nitrogen). **(1m)**

iii) Any reasonable range from 45°C – 55°C. **(1m)**

b) From 15°C to 75°C, activity decreases and stops at 85°C. **(1m)** This is because enzyme is denatured / active site is destroyed. **(1m)**

c) Stomach/pancreas/duodenum (small intestine) – Any 2. **(2m)** → *You don't have to worry, you'll learn more about this in your future lesson ☺*