

Full Higher Separate content. ★ = Higher Tier. ◆ = Separate Science only.

**Q1. State the substrate and products of (a) amylase, (b) protease, (c) lipase.**

[3 marks]

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**Q2. Explain the role of bile in the digestion of fats.**

[2 marks]

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**Q3. Describe the role of the stomach in digestion.**

[3 marks]

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**Q4. Explain how villi are adapted for absorption of nutrients in the small intestine.**

[3 marks]

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**Total: 11 marks**

**Q1 (3 marks)**

*State the substrate and products of (a) amylase, (b) protease, (c) lipase.*

- (a) Starch → sugars [1]
- (b) Proteins → amino acids [1]
- (c) Fats/lipids → fatty acids and glycerol [1]

**Q2 (2 marks)**

*Explain the role of bile in the digestion of fats.*

- Bile emulsifies fats — breaks large fat globules into tiny droplets [1]
- Greatly increases the surface area for lipase to act on → faster digestion [1]

**Q3 (3 marks)**

*Describe the role of the stomach in digestion.*

- Muscular walls churn food into a liquid (chyme) — mechanical digestion [1]
- Hydrochloric acid (pH 2): kills bacteria; provides acidic environment for pepsin [1]
- Pepsin (protease): begins digestion of proteins → peptides [1]

**Q4 (3 marks)**

*Explain how villi are adapted for absorption of nutrients in the small intestine.*

- Large surface area — many finger-like villi with microvilli [1]
- Thin walls (one cell thick) — short diffusion distance [1]
- Dense blood capillary network — maintains steep concentration gradient [1]