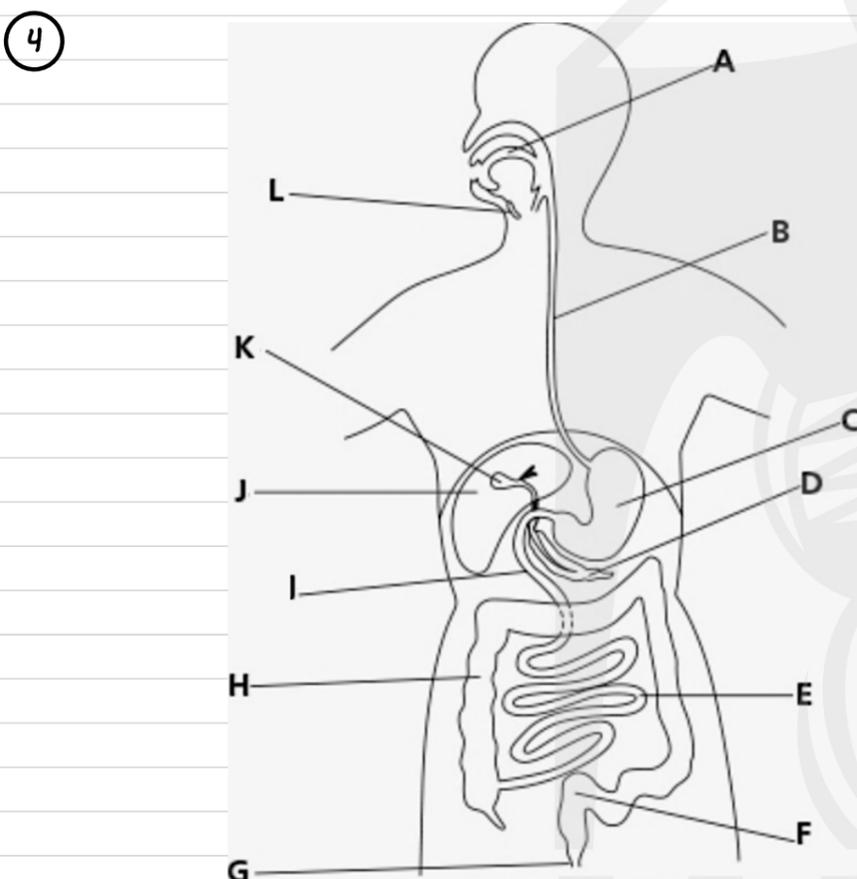


Markscheme

- 1) 1- enzymes massively speed up the rate of chemical reactions. Without enzymes, it would take soooo long (years) before macromolecules were broken down in order to be used as energy in respiration, i.e. we would die waiting.
2- enzymes catalyse the breakdown of larger macromolecules into smaller molecules, allowing them to be small enough to be absorbed by villi.

- 2) a) Mouth - teeth physically breaking down food into smaller pieces
Stomach - muscles contract, moving and churning food, mixing it with enzymes
Duodenum - Liver produces bile and it secreted from bile duct. Bile emulsifies fats, breaking them down into smaller fat droplets
- b) Even though physical digestion does not fully break down chemicals, it speeds up the rate of digestion. It does this in 2 ways:
By breaking food into smaller pieces, it increases its surface area: volume, allowing more enzymes to catalyze it.
By moving food around, it puts it into greater contact with enzymes.

Enzyme	Substrate(s)	product(s)	secreted by	secreted into
salivary amylase	starch	maltose	salivary gland	mouth
pepsin	protein/polypeptide	shorter peptides/amino acids	stomach	stomach
pancreatic amylase	starch	maltose	pancreas	duodenum
lipase	triglyceride	glycerol + fatty acids	pancreas	duodenum
trypsin	protein/polypeptide	shorter peptides/amino acids	pancreas	duodenum



1. A - mouth (oral cavity)
2. B - oesophagus
3. C - stomach
4. D - pancreas
5. E - ileum (small intestine)
7. F - rectum (large intestine)
8. G - anus (large intestine) * accessory organ
6. H - colon (large intestine)
4. I - duodenum (small intestine)
- J - liver *
- K - gall bladder *
- L - salivary gland *

- 5) Function of ileum is to absorb digested molecules. Adaptations: 1) Villi and microvilli increase SA:vol, increasing rate of absorption
2) Epithelium is only 1 cell thick and very close to capillary and lacteal: short distance for transport
3) Villi have rich blood supply allowing regular and constant movement
4) longitudinal and circular muscles use peristalsis to move food through, promoting absorption

- 6) The colon is home to trillions of bacteria. In the colon they are beneficial and not dangerous as inside colon is technically not 'inside' our body and they do not cause harm. However, a rupture provides an opening and bacteria will start multiplying within body, causing damage and may lead to disease and even death

- 7) 1) Kills harmful bacteria that may be on food 2) provides optimal low pH for enzyme pepsin to function optimally

- 8) 1) As we don't break it down, it moves into the colon relatively intact. Here, (depending on the type of fibre) it can be broken down by 'good' bacteria, which in turn provides us health benefits. 2) As a lot of fibre ultimately passes through the colon unbroken, it prevents constipation and promotes regular bowel movement by increasing the bulk of faeces and reducing time waste spends in colon.

	carbohydrates	lipids
digested	in mouth and duodenum by amylase	in duodenum by bile and lipase
absorbed	monosaccharides actively transported into cell + diffuse into capillaries	glycerol and fatty acids diffuse into lacteal
stored	in liver and muscles as glycogen	in adipose cells as triglycerides
used	short-term energy use for respiration	long-term energy use, build cell membranes, insulation