6.1 Digestion – summary of mark schemes

6.1.2 Explain the need for enzymes in digestion.

Mark Scheme

A. large molecules cannot be absorbed;
B. large food molecules must be broken down;
C. such as carbohydrates / proteins, etc;
D. mechanical digestion only to break down food physically;
E. enzymes breakdown large molecules into smaller ones (that can be absorbed);
F. by hydrolysis of bonds / to form monomers;
G. in preparation for absorption;
H. rate of reaction at body temperature too slow;
I. enzymes increase the rate of breakdown / act as catalysts;
J. need several enzymes as they are substrate specific;
K. protease / trypsin / pepsin / chymotrypsin / other named protease digest proteins into polypeptides / peptides / amino acids / peptides;
L. lipase digest lipids into glycerol / fatty acids;
M. amylase digest polysaccharides into disaccharides / monosaccharides;

6.1.3 State the source, substrate, products and optimum pH conditions for one amylase, one protease and one lipase.

Mark Scheme

A. amylase;
B. source: pancreas / salivary gland;
C. substrate: starch; (Do not accept carbohydrate.)
D. product: maltose;
E. optimum pH: 7-8 / slightly alkaline;

6.1.4 Draw and label a diagram of the digestive system.

Mark Scheme

A. mouth / teeth / tongue;
B. salivary glands;
C. esophagus: attached to both mouth and stomach;
D. stomach: j-shaped sac attached to esophagus and u-shaped portion of
E. small intestine;
F. large intestine: wider diameter than small intestine, attached to small intestine;
G. pancreas: leaf-shaped, in u-shaped region of small intestine with small duct connected to small intestine;
H. liver: large, triangular, to left of stomach;
I. gall bladder: small sac drawn on top of liver with tube connected to small intestine at same region as duct from pancreas;
J. anus: at end of large intestine but narrower in diameter;
K. rectum;
L. sphincters;

6.1.6 Distinguish between absorption and assimilation.

Mark Scheme

A. absorption is taking up of a substance by the skin / mucous membranes / digestive tract / cell membranes / layers of cells / the bloodstream;

6.1.7 Explain how the structure of the villus is related to its role in absorption and transport of the products of digestion.

Mark Scheme

Structure:
A. lymph vessel;
B. arteriole;
C. venule;  
D. (central) lacteal;  
E. capillary network;  
F. epithelial layer / lining / epithelium;  
G. microvilli;  
H. goblet cells; 

Function  
I. villus intestinal wall has many folds to increase surface area ( : volume ratio);  
J. surface of villus close to blood vessels so materials can easily diffuse;  
K. surface of villus close to lymph vessels so lipids can be easily absorbed;  
L. greater surface area related to greater rate of diffusion;  
M. villus wall consists of single layer of cells;