Intervention work – Enzymes and Digestion ANSWERS

NAME __ANSWERS_____

Fill in the spaces in the passage below and answer the questions at the end:

(1)When a person takes in food by mouth, the food is digested in the alimentary canal. This results in large pieces of food being _broken down into small molecules which are soluble and are able to enter body cells through the cell __membranes .

There are two principal processes involved in digestion: mechanical digestion involves cutting and grinding large pieces of food into smaller pieces: chemical digestion is the hydrolysis of large molecules into smaller ones. For hydrolysis to occur quickly at body temperature, catalysts must be present. The body's catalysts are called _enzymes and each _enzyme is highly specific in its action. The first enzyme encountered by the food is present in saliva. This enzyme is called amylase and it catalyses the reaction of starch with water to produce a sugar called maltose.

After the food has been chewed and mixed with saliva in the mouth, it can be swallowed. During swallowing the food id prevented from entering the lungs due to the action of the epiglottis which seals off the top of the larynx. The food is moved through the rest of the gut automatically by a process called __peristalsis. When the food arrives in the stomach it has gastric juice secreted onto it and it is "disinfected" by the action of dilute hydrochloric acid which will kill most bacteria present in the food. The acid also provides an optimum pH for the stomach proteases, allowing these enzymes to function as efficiently as possible. The food remains in the stomach for around 4 hours and at body temperature any solid fats will probably melt. Peristalsis in the stomach walls causes thorough mixing of the food with the gastric juice and a runny mixture called chyme is produced.

The pyloric sphincter which separates the stomach from the small intestine, then relaxes and the chime is squirted through into the small intestine. Here it receives three secretions, one from the liver,
one from the pancreas and one from the gut lining.

The secretion from the liver has two principle actions which are to emulsify fats and to neutralise the acid from the stomach. Both of these actions assist the digestion of fat. The pancreatic juice also helps to neutralise the acid and contains several digestive enzymes including proteases, lipases and amylases.

The products of digestion which include simple sugars, amino acids, fatty acids and glycerol are then absorbed across the lining of the small intestine (the ileum) which has a large surface area due to folding and the presence of vili, into the bloodstream or lymph system to be transported throughout the body. Water is absorbed especially in the colon leaving a semi solid, non digestible waste which is removed periodically as faeces via the anus. (24)

(2) Explain the meaning of each of the following terms:

a) enzyme_ biological catylist, speeds up the rate of a chemical reaction without altering the products of the reaction xref topic 1 cells and enzymes (1)

b) epiglottis flap of skin at top of trachea, prevents food entering (1)

c) pyloric sphincter_exit of stomach, controls release of chime into duodenum (1)

d) peristalsis muscular contaction of mucles in wall of gut to move food along entire gut ___(2)

(3) Name TWO products of digestion which enter the blood___ glucose, amino acids _____(2)

(4) Name the vein which carries blood, rich in absorbed food, away from the gut _____ hepatic portal vein (hpv) (1)

(5) List the reagents used to test food for the presence of starch iodine solution__, for the presence of simple sugars _Benedicts solution_, for the presence of protein Biuret reagent__ and the presence of Vitamin DCPIP___ (4)

Total Mark: _____/36 Percentage: _____

Parent/Guardian Signature: _____