

I : DIGESTIVE SYSTEM

1. Which of the following structures does food enter after it leaves the esophagus?
 - A. liver
 - B. pharynx
 - C. stomach
 - D. pancreas

2. Which of the following enzymes is correctly matched with its site of production?
 - A. amylase—liver
 - B. pepsin—stomach
 - C. maltase—pancreas
 - D. trypsin—small intestine

3. Enzymes that digest proteins, carbohydrates and lipids are secreted by the
 - A. stomach.
 - B. pancreas.
 - C. small intestine.
 - D. salivary glands.

4. Insulin is produced in the
 - A. liver.
 - B. pancreas.
 - C. thyroid gland.
 - D. adrenal gland.

5. The reaction shown below is catalyzed by secretions from which organs?
protein + H₂O → peptides
 - A. pancreas and liver
 - B. liver and duodenum
 - C. stomach and pancreas
 - D. duodenum and stomach

6. Increasing the secretion of insulin would have which of the following effects?
 - A. decreased blood sugar
 - B. decreased metabolic rate
 - C. increased protein synthesis
 - D. increased digestion of carbohydrate

7. High levels of toxins in the blood may indicate a problem with the function of the
 - A. liver.
 - B. stomach.
 - C. pancreas.
 - D. small intestine.

8. A stimulus in the esophagus

- A. moves food to the stomach.
- B. opens the pyloric sphincter.
- C. activates the salivary glands.
- D. causes the secretion of pepsinogen.

9. Sodium bicarbonate (NaHCO_3) in pancreatic juice

- A. emulsifies fats.
- B. activates pepsin.
- C. neutralizes acid chyme.
- D. stimulates the release of insulin.

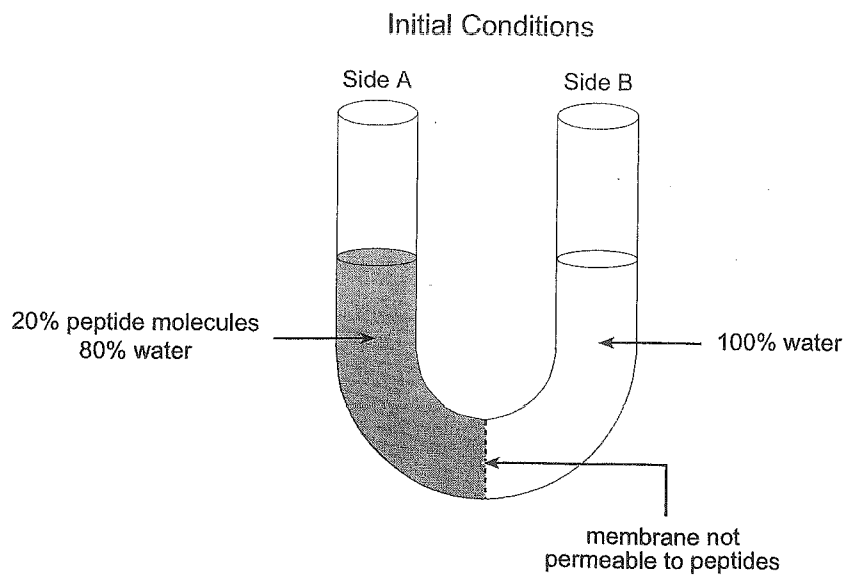
10. The liver plays vital roles in all of the following systems **except** the

- A. nervous system.
- B. digestive system.
- C. excretory system.
- D. circulatory system.

11. Vitamins and amino acids are produced in the large intestine by

- A. feces.
- B. bacteria.
- C. the cells of the villi.
- D. the reabsorption of water.

Use the following diagram to answer question 12.

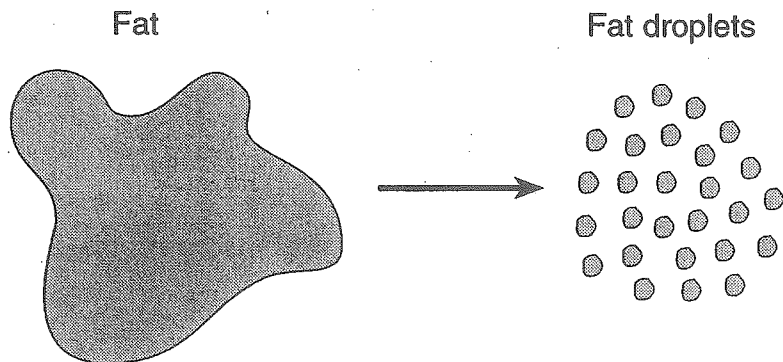


12. If peptidase were added to side A, what would occur?

- A. Amino acids would be found on side A only.
- B. Amino acids would be found on side B only.
- C. Amino acids would be found on both sides A and B.
- D. No amino acids would be found on either side A or side B.

13. The chemical digestion of fats is a result of the release of secretions from the
- A. pancreas.
 - B. gall bladder.
 - C. small intestine.
 - D. salivary glands.

Use the following diagram to answer question 14



14. Secretions from which of the following would have the effect shown in the diagram?

- A. liver
- B. mouth
- C. stomach
- D. large intestine

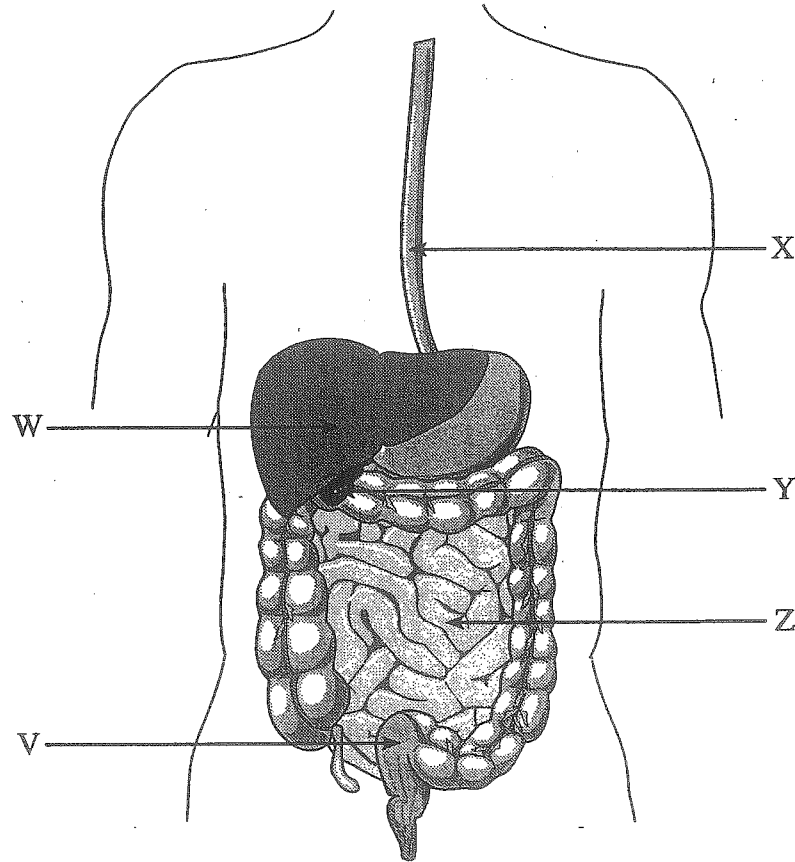
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15. Which of the following is not a function of the liver?

- A. production of urea
- B. synthesis of plasma proteins
- C. secretion of digestive enzymes
- D. regulation of blood glucose levels

16. Saliva contains an enzyme that partially digests

- A. fat.
- B. starch.
- C. protein.
- D. nucleic acids.

Use the following diagram to answer questions 17 and 18



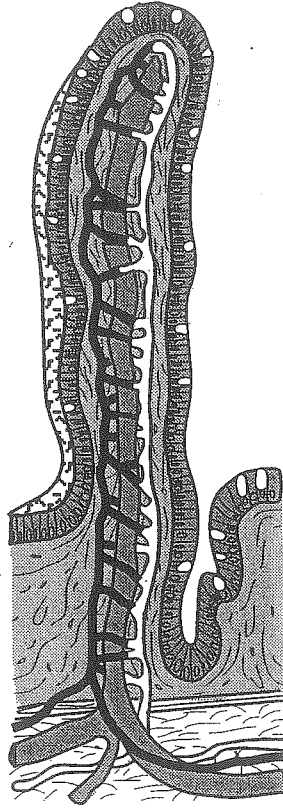
17. The structure labelled X is the

- A. trachea.
- B. pharynx.
- C. epiglottis.
- D. esophagus.

18. Which structure stores bile?

- A. V
- B. W
- C. Y
- D. Z

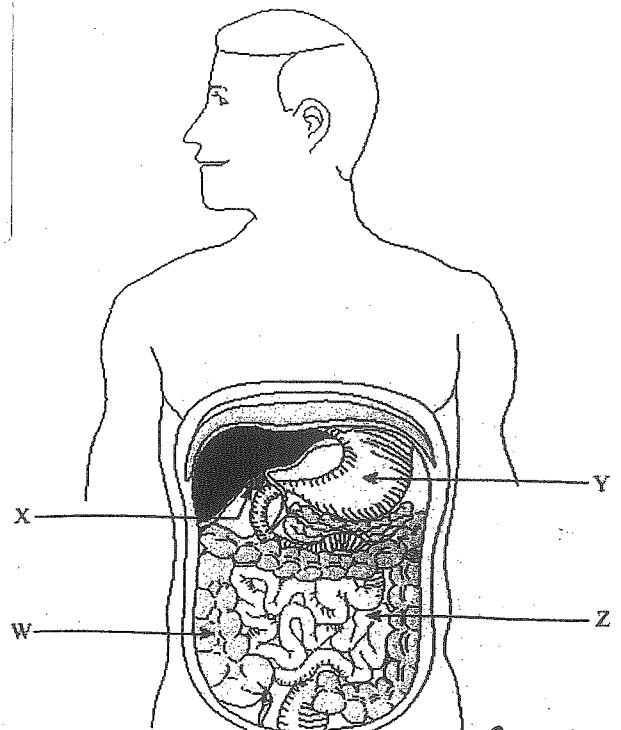
Use the following diagram to answer question 19



19. The structure above is found lining the walls of the

- A. colon.
- B. stomach.
- C. esophagus.
- D. small intestine.

Use the following diagram to answer questions 20 and 21



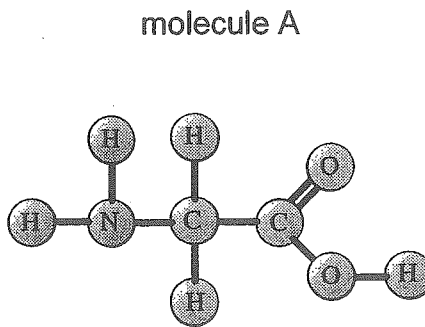
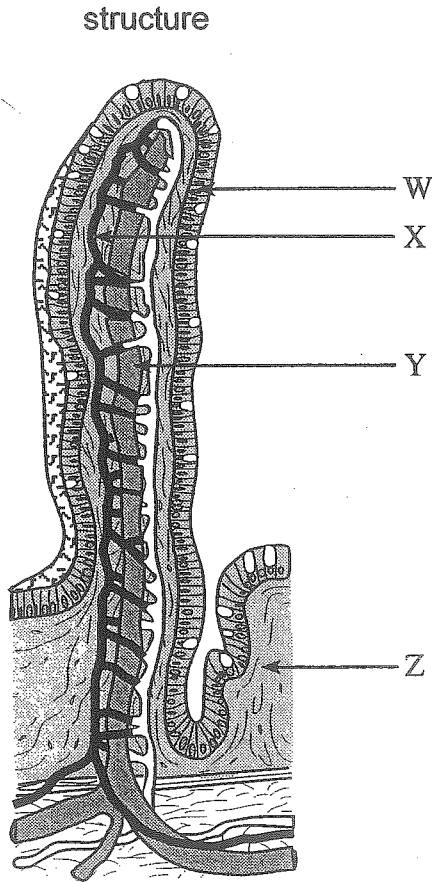
20. The structure labelled X releases a substance after the ingestion of

- A. fat. B. starch. C. protein. D. carbohydrate.

21. Digestion of peptides and absorption of their products occurs in which of the structures?

- A. W B. X C. Y D. Z

Use the following diagrams to answer question 22



22. Where in the structure would molecule A be transported to?

- A. W
- B. X
- C. Y
- D. Z

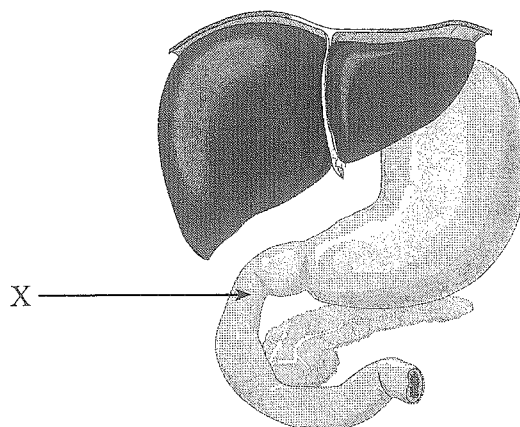
23. Secretions from the stomach promote the digestion of

- A. fats.
- B. proteins.
- C. nucleic acids.
- D. carbohydrates.

24. Which of the following statements about insulin is correct?

- A. Insulin is produced by the liver.
- B. Insulin causes a decrease in blood sugar.
- C. Insulin decreases the hydrogen ion concentration in the blood.
- D. Insulin is secreted when fats are present in the digestive system.

Use the following diagram to answer question 25



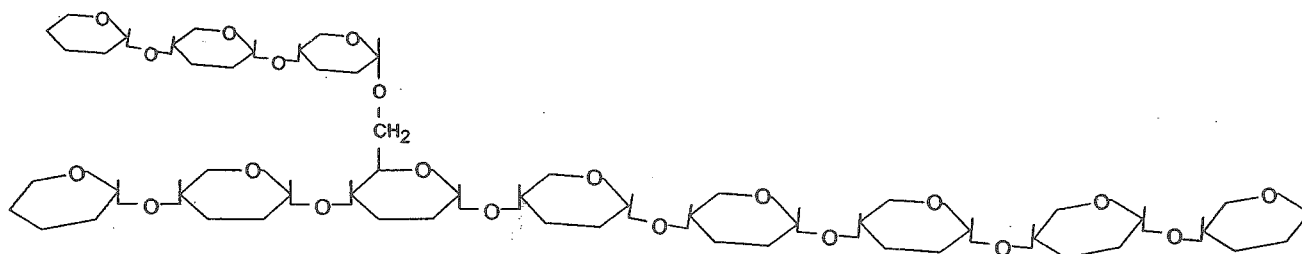
25 The structure labelled X is the

- A. appendix.
- B. epiglottis.
- C. duodenum.
- D. gall bladder.

26 Which of the following is **not** a function of the liver?

- A. producing bile
- B. secreting insulin
- C. detoxifying blood
- D. making blood proteins

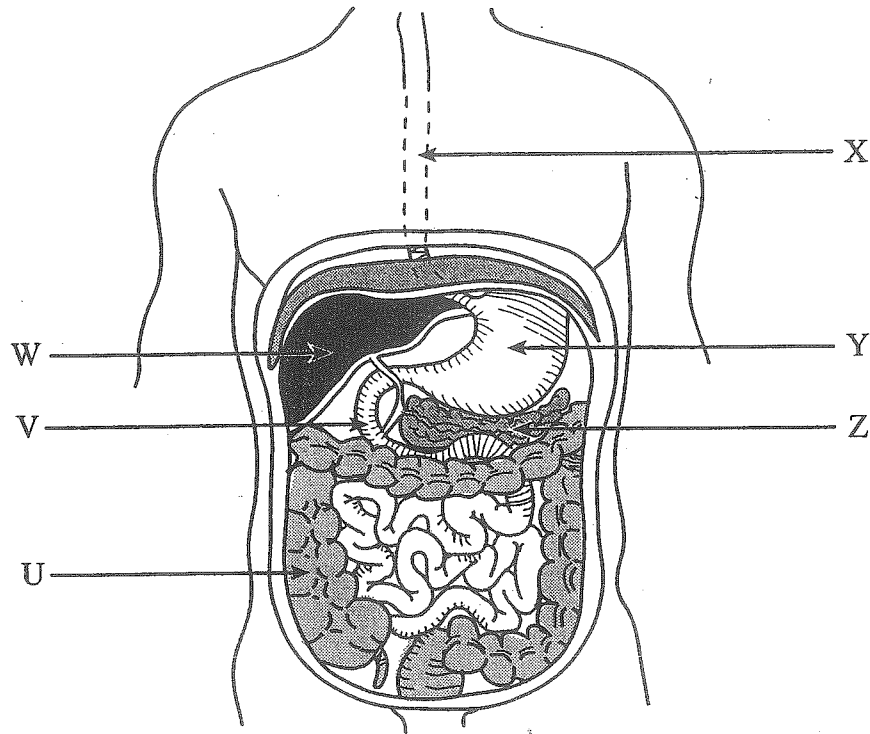
Use the following diagram to answer question 27



27 Enzymes required to digest the molecule represented in the diagram are produced in the

- A. liver.
- B. colon.
- C. stomach.
- D. salivary glands.

Use the following diagram to answer questions 28 and 29.



28. Which two structures do not produce enzymes involved in digestion?

- A. U and W
- B. U and Z
- C. Y and Z
- D. X and Y

29. The structure labelled V is the

- A. liver.
- B. stomach.
- C. pancreas.
- D. duodenum.

30. Which of the following protects the walls of the stomach from hydrochloric acid?

- A. bile
- B. pepsin
- C. mucus
- D. bicarbonate ions

31. How many of the following events require substances produced in the liver?

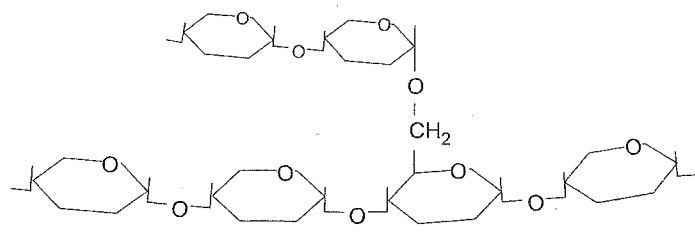
- emulsification of fats
- secretion of peptidases
- capillary fluid exchange
- detoxification of alcohol
- neutralization of pancreatic juice
- a rise in blood glucose levels between meals

- A. three
- B. four
- C. five
- D. six

32. Which of the following digestive enzymes is correctly matched with its optimum pH?

	Digestive Enzyme	Optimum pH
A.	trypsin	3
B.	lipase	3
C.	amylase	8
D.	pepsin	8

Use the following diagram to answer question 33.



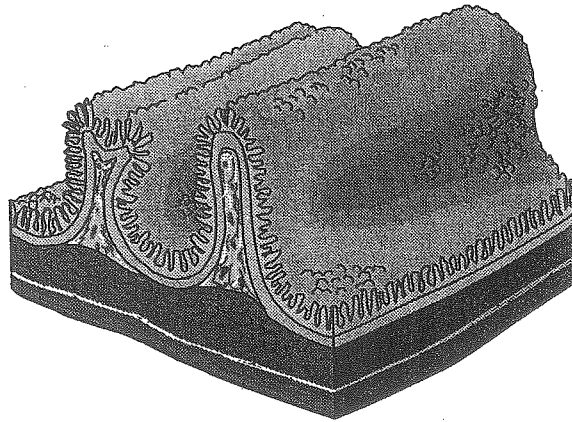
33. The production of the molecule above increases in the body when a hormone is released from the

- A. liver.
- B. pancreas.
- C. thyroid gland.
- D. adrenal glands.

34. A person's ability to breathe and swallow is impaired when the tonsils are swollen. What region is affected?

- A. larynx
- B. trachea
- C. pharynx
- D. esophagus

Use the following diagram to answer question 35.



35. The section of tissue shown in the diagram was taken from the

- A. colon.
 - B. stomach.
 - C. pancreas.
 - D. small intestine.
-

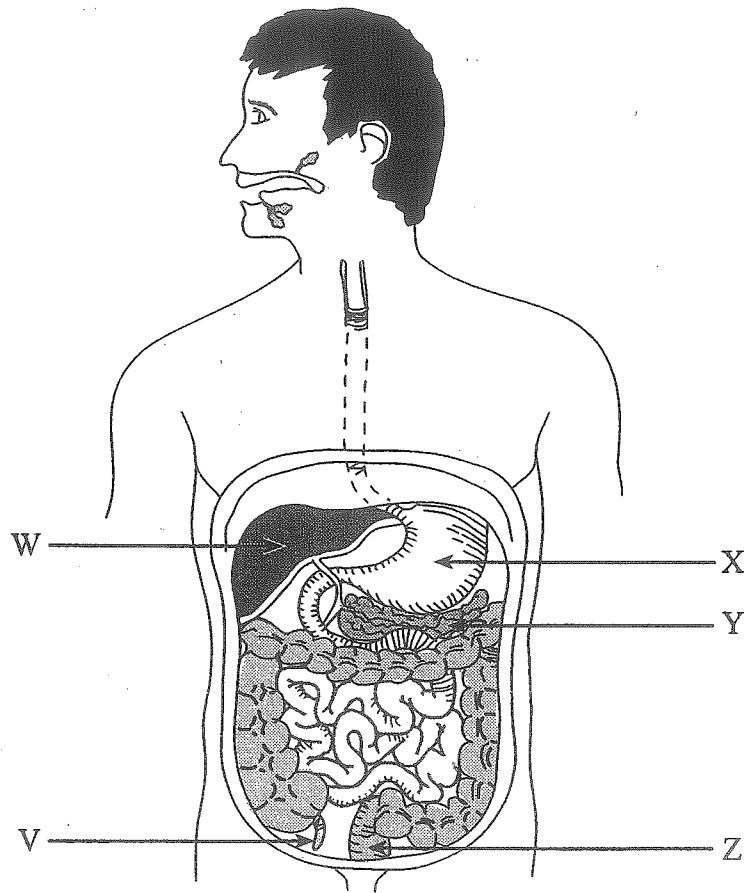
36. The structure that prevents regurgitation of food from the intestine back into the stomach is the

- A. pyloric sphincter.
- B. cardiac sphincter.
- C. duodenal sphincter.
- D. atrioventricular valve.

37. The chemical digestion of polysaccharides begins in the

- A. colon.
- B. mouth.
- C. stomach.
- D. small intestine.

Use the following diagram to answer questions 38 and 39.



38. Which letter indicates the appendix?

- A. V
- B. W
- C. X
- D. Y

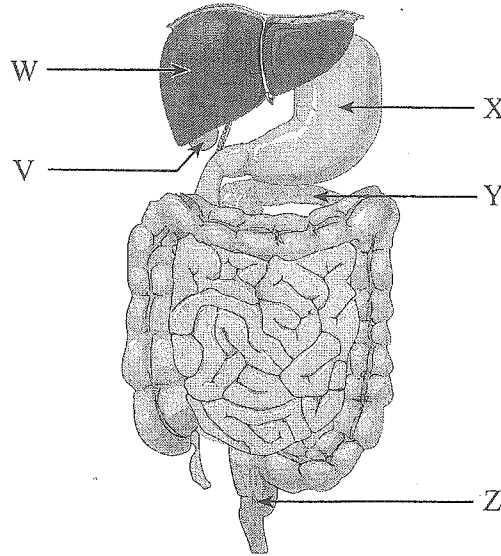
39. The structure labelled Z is the

- A. anus.
- B. rectum.
- C. duodenum.
- D. small intestine.

40. The amount of chyme (stomach contents) which enters the small intestine is controlled by

- A. the release of gastric juice.
- B. peristalsis in the esophagus.
- C. secretions from the pancreas.
- D. constrictions of the pyloric sphincter.

Use the following diagram to answer questions 41 and 42



41. Which letter identifies the gall bladder?

- A. V
- B. X
- C. Y
- D. Z

42. Which organ is involved in maintaining a constant level of glucose in the blood?

- A. V
 - B. W
 - C. X
 - D. Z
-

43. Which of the following substances is chemically digested by a component of saliva?

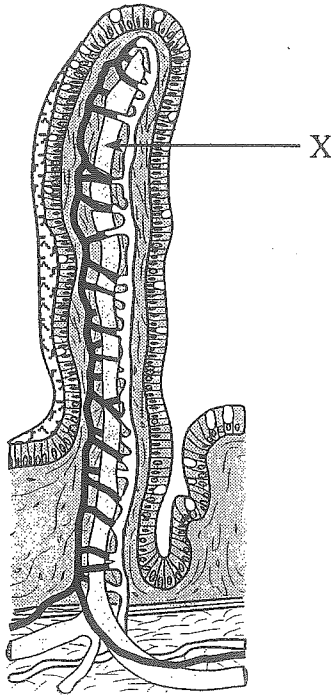
- A. lipid
 - B. starch
 - C. protein
 - D. nucleic acid
-

44. Bicarbonate ions and digestive enzymes are present in secretions from the

- A. liver.
- B. stomach.
- C. pancreas.
- D. small intestine.

45. Lipase, when added to gastric juice, is ineffective due to the presence of
- A. mucus.
 - B. trypsin.
 - C. bicarbonate ions.
 - D. hydrochloric acid.
46. Villi are found in the
- A. esophagus.
 - B. liver.
 - C. small intestine.
 - D. stomach.
47. Which of the following organs is malfunctioning when the concentration of nitrogenous wastes in the blood increases?
- A. kidney
 - B. stomach
 - C. pancreas
 - D. small intestine
48. Insulin secretion is increased when the level of
- A. sodium in the blood is low.
 - B. sodium in the blood is high.
 - C. glucose in the blood is low.
 - D. glucose in the blood is high.
49. Bile acts as an emulsifier by
- A. increasing the surface area of lipids.
 - B. removing hydrogen atoms from lipids.
 - C. breaking the bonds between fatty acids and glycerol.
 - D. converting unsaturated fatty acids to saturated fatty acids.
50. The liver makes blood plasma hypertonic to the fluid surrounding tissues by
- A. breaking down hemoglobin.
 - B. storing glucose as glycogen.
 - C. making plasma proteins from amino acids.
 - D. detoxifying and removing poisonous substances.

Use the following diagram to answer questions 51 and 52



51. The structure above is found in the

- A. liver.
- B. stomach.
- C. renal medulla.
- D. small intestine.

52. Structure X is specialized to

- A. absorb fats.
- B. repackage glucose.
- C. transport amino acids.
- D. secrete hydrochloric acid.

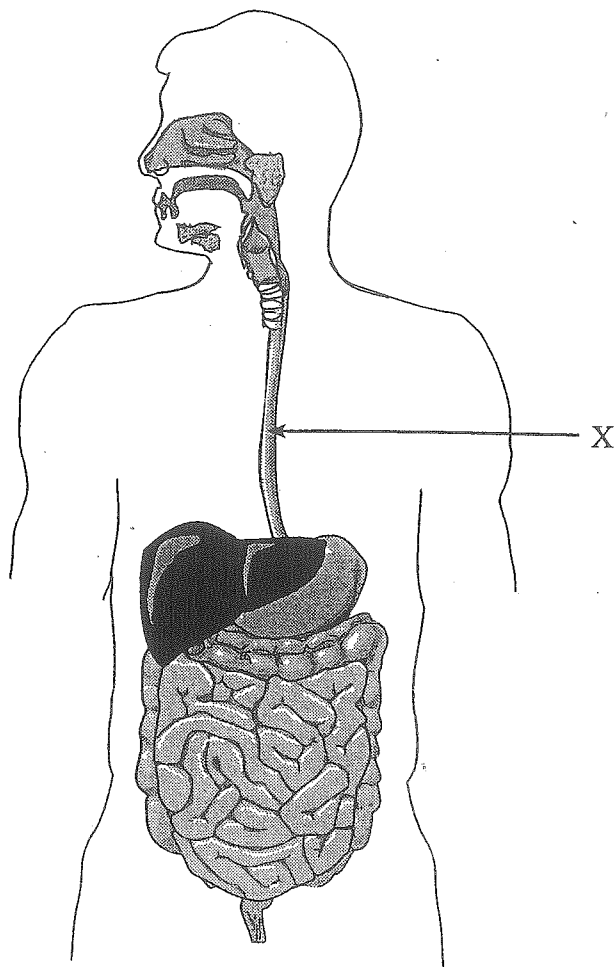
Use the following information to answer question 53

- bacteria cells are destroyed
- amylase becomes denatured
- pepsinogen becomes activated
- trypsinogen changes into trypsin

53. How many of the results above are from the action of gastric juice?

- A. one
- B. two
- C. three
- D. four

Use the following diagram to answer question 54.



54. The structure labelled X is the

- A. pharynx.
- B. epiglottis.
- C. esophagus.
- D. duodenum.

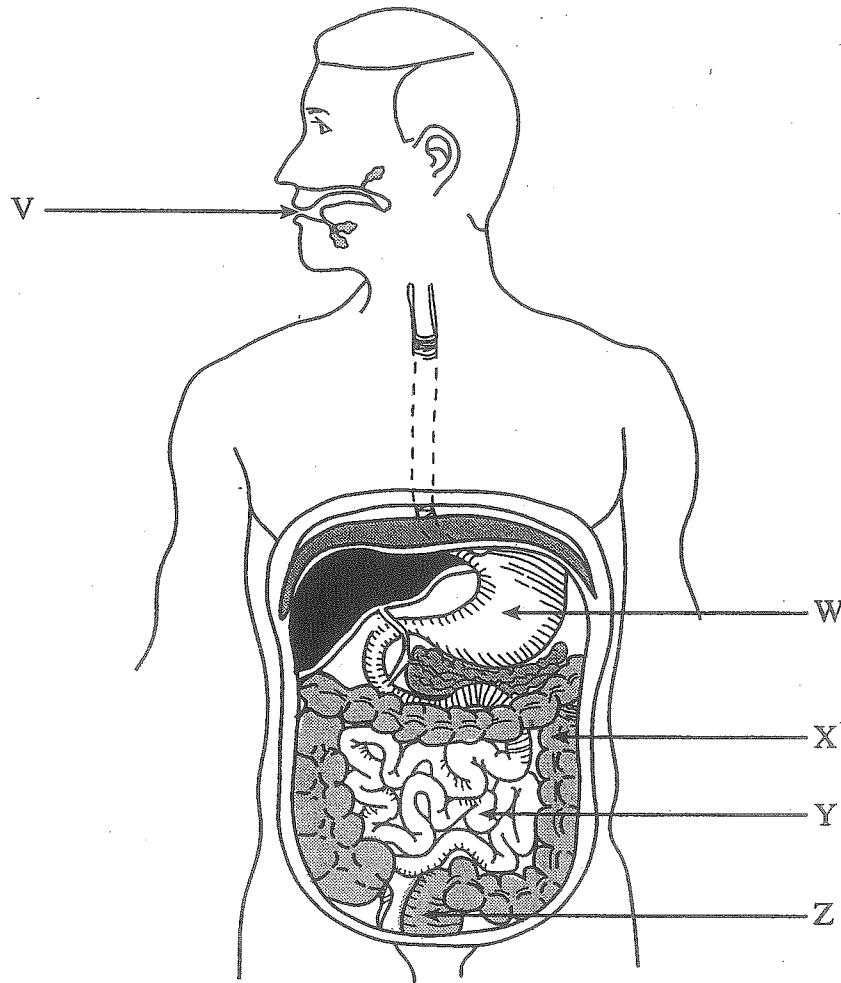
55. A bacterial infection inhibits the absorption of water in the digestive system leading to dehydration. The infection is located in the

- A. liver.
- B. stomach.
- C. duodenum.
- D. large intestine.

56. Which of the following types of molecules does not have to be digested before being absorbed?

- A. maltose
- B. peptides
- C. amino acids
- D. nucleic acid

Use the following diagram to answer question 57.



57. Hydrolysis of peptide bonds found in food occurs in

- A. V and Z.
- B. W and Y.
- C. X and V.
- D. X and Z.

Use the following information to answer question 58.

- colon
- pancreas
- gall bladder
- small intestine
- salivary glands

58. How many of the structures above produce enzymes that digest carbohydrates?

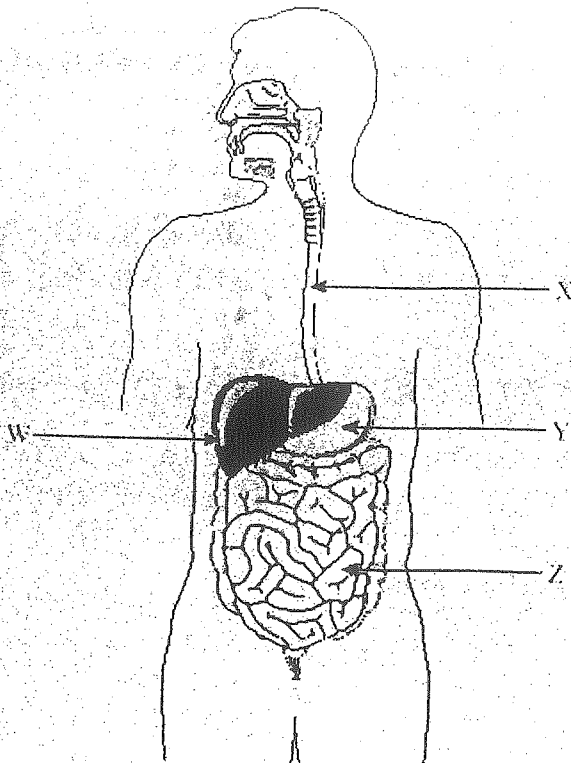
- A. two
- B. three
- C. four
- D. five

59. A function of the small intestine is to
- A. secrete bile.
 - B. filter wastes.
 - C. make vitamins.
 - D. absorb nutrients.

60. The function of the pyloric sphincter is to prevent the backflow of material from the
- A. esophagus to the mouth.
 - B. duodenum to the stomach.
 - C. stomach to the esophagus.
 - D. colon to the small intestine.

61. Blood glucose levels are lowered by insulin because it stimulates
- A. gluconeogenesis.
 - B. the uptake of glucose by cells.
 - C. the conversion of glucose to fatty acids.
 - D. the conversion of glucose to amino acids.

Use the following diagram to answer question 62

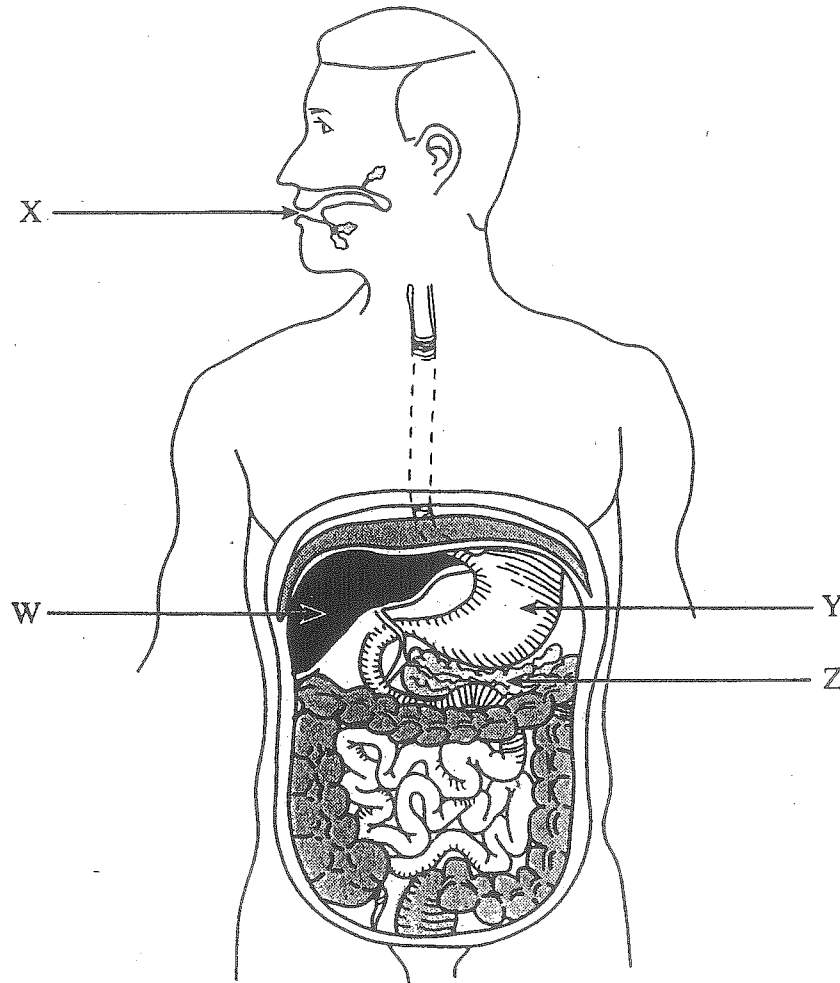


62. In which structure indicated would the following reaction occur?



- A. W
- B. X
- C. Y
- D. Z

Use the following diagram to answer questions 63 and 64



63. Which organ releases an enzyme that digests fats?

- A. W
- B. X
- C. Y
- D. Z

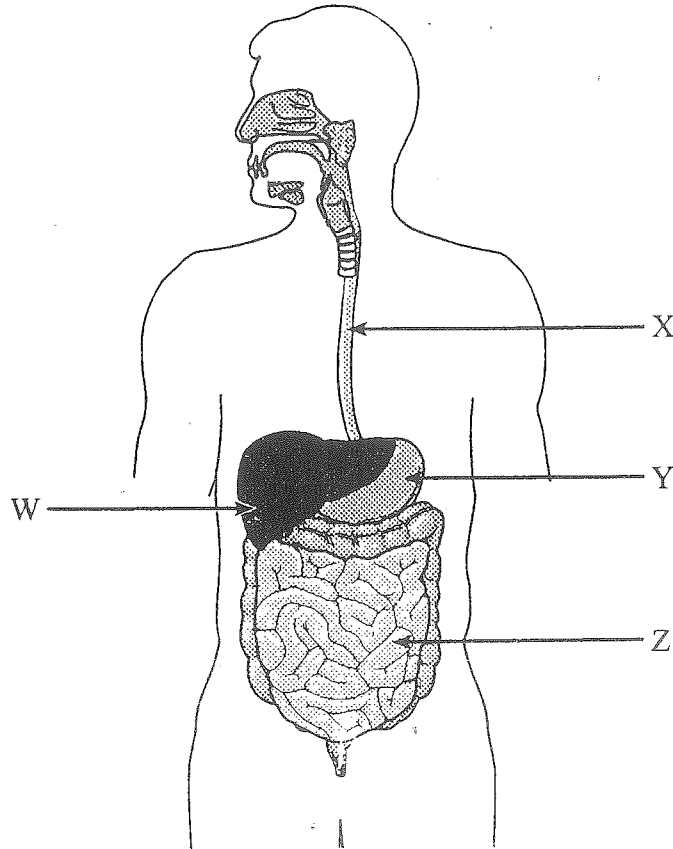
64. Which organ functions to kill bacteria, store food and digest protein?

- A. W
- B. X
- C. Y
- D. Z

65. Which organ has a large surface area and has special adaptations for the absorption of fats?

- A. mouth
- B. stomach
- C. esophagus
- D. small intestine

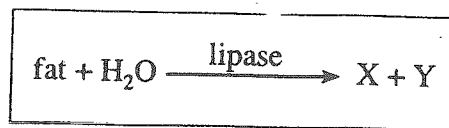
Use the following diagram to answer question 66



66 The breakdown of some poisonous substances found in the blood occurs in organ

- A. W
- B. X
- C. Y
- D. Z

67 In the following reaction, product X could be a(n)



- A. peptide.
- B. fatty acid.
- C. nucleotide.
- D. amino acid.

68. Which two enzymes break down the same substrate?

- A. trypsin and pepsin
- B. pepsin and peptidase
- C. lipase and salivary amylase
- D. pancreatic amylase and maltase

69. A piece of living small intestine was placed in a solution containing maltose, egg white, and fats. In order to ensure that the piece of intestine functioned normally, oxygen was bubbled through the solution and the pH was maintained at 8.2. After one hour the solution was analyzed.

a) Explain why glucose was found in the solution. (1 mark)

b) Products from the breakdown of fat were not found. Explain why. (1 mark)

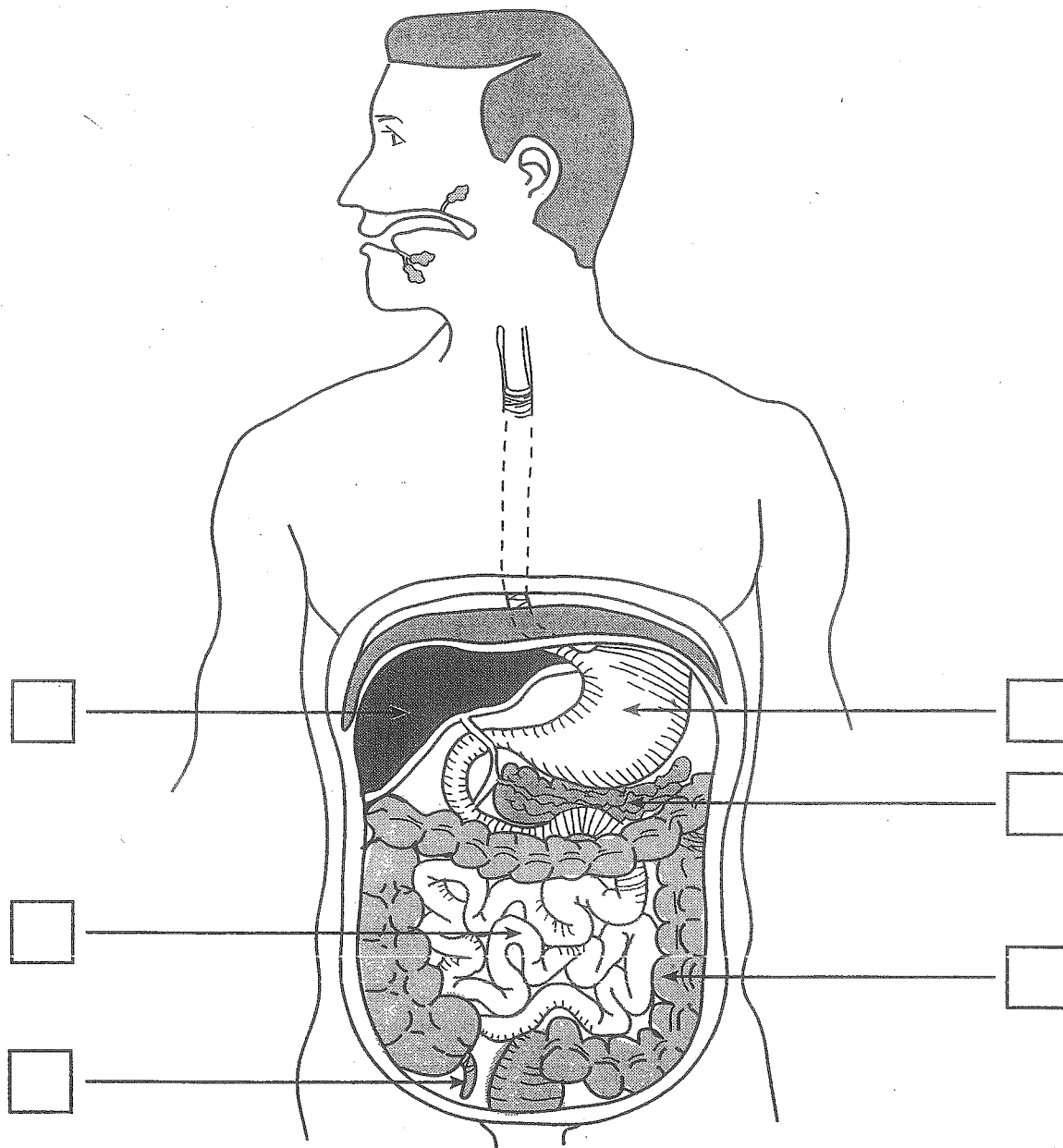
c) Why was the solution buffered to pH 8.2? (1 mark)

d) In a variation of this experiment, trypsin was also added to the solution. Describe the results of this new experiment after one hour. (3 marks)

70. State four ways in which the liver is important to the human body. (4 marks)

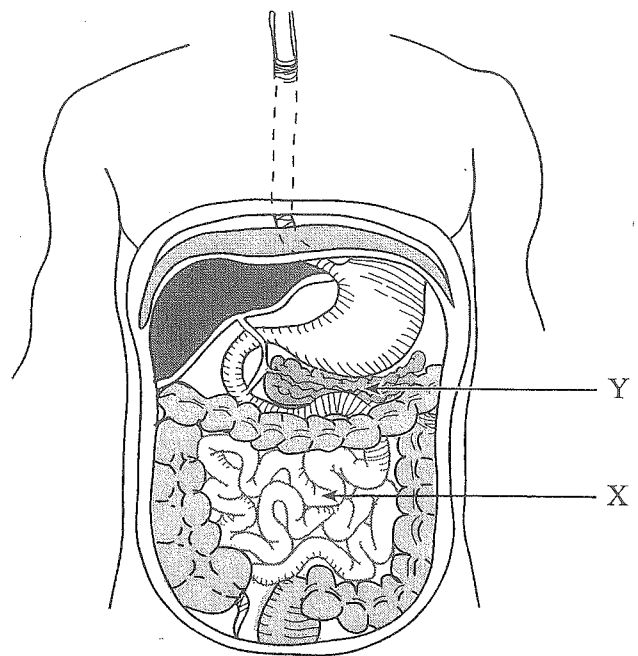
- i) _____
- ii) _____
- iii) _____
- iv) _____

Use the following diagram to answer question 73.


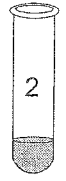
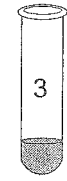


73. Place the correct number for each of the following descriptions in the appropriate box at the location in the diagram. Not all the descriptions will be used. (6 marks)

1. kills bacteria
2. lined with cilia
3. produces thyroxin
4. lipid emulsifier produced here
5. contains bacteria that produce vitamins
6. has no known digestive function in adults
7. where maltose is broken down into glucose
8. hormone that controls blood sugar produced here



74. Secretions from glands in the walls of structure X and secretions from structure Y are collected and added to test tubes containing three substrates as shown below. The test tubes are allowed to stand for one hour. Blue litmus paper, which turns red in the presence of an acid, is used as an indicator.

	 1	 2	 3
Substrate	starch	fats	protein
Secretions from	X and Y	X and Y	X and Y

a) The test tubes were sampled during a one hour period. Identify any new substances produced in the following test tubes and account for their presence.

Test tube 1: (2 marks)

Test tube 2: (2 marks)

b) Each test tube was tested with litmus paper at the beginning of the experiment and after one hour. In test tube 3, the litmus paper changed from blue at the beginning of the experiment to red after one hour. Explain what occurred in the test tube to cause the litmus paper to turn red. (2 marks)

77. In an experiment designed to test the effects of environmental conditions on the ability of enzymes to digest food, the following steps are carried out:

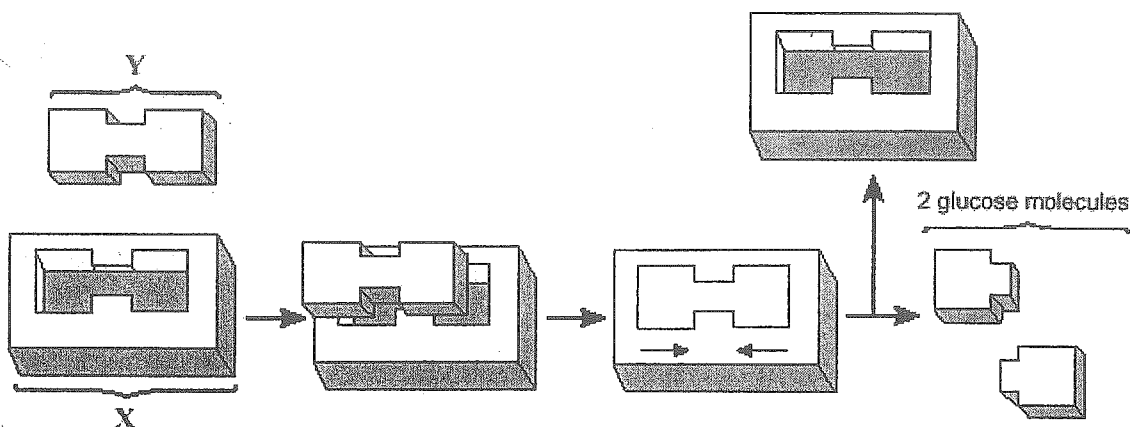
- Four test tubes are labelled A, B, C and D.
- All tubes contain distilled water and a small amount of egg white (protein).
- Individual tubes have additional contents as shown in the table below.
- All tubes are to be incubated at 37°C for one hour.

For each tube, explain what will happen and why.

(8 marks: 1 mark each for result; 1 mark each for explanation)

TUBE	INITIAL CONTENTS	ADDITIONAL CONTENTS	RESULT AND EXPLANATION
A	distilled water + egg white	none	
B	distilled water + egg white	pepsin	
C	distilled water + egg white	pepsin + hydrochloric acid (at pH 3)	
D	distilled water + egg white	hydrochloric acid (at pH 3)	

Use the following diagrams to answer question 78.



78 a) The diagrams illustrate a reaction that occurs in the small intestine. Give the specific name for each of the following.

Molecule X: (1 mark)

Molecule Y: (1 mark)

b) In a laboratory experiment, substance Y was added in increasing amounts until it eventually had no effect on the rate of the reaction. Explain why. (1 mark)

c) A solution containing lead ions was added to the reaction. How will the addition of this solution affect the reaction? Explain why. (2 marks)

79 a) State two functions of structure Z. (2 marks)

- i) _____
- ii) _____

b) For each of the following structures, list one enzyme it secretes and the substrate that the enzyme acts upon. (4 marks: 1 mark each for enzyme; 1 mark each for substrate)

Structure X: _____

Enzyme: _____

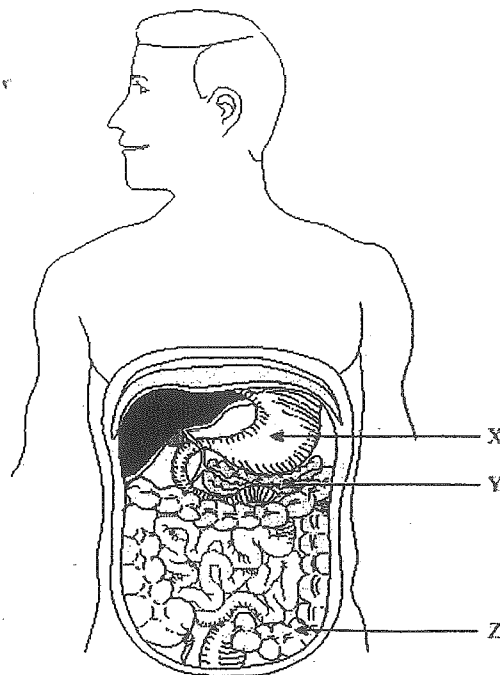
Substrate: _____

Structure Y: _____

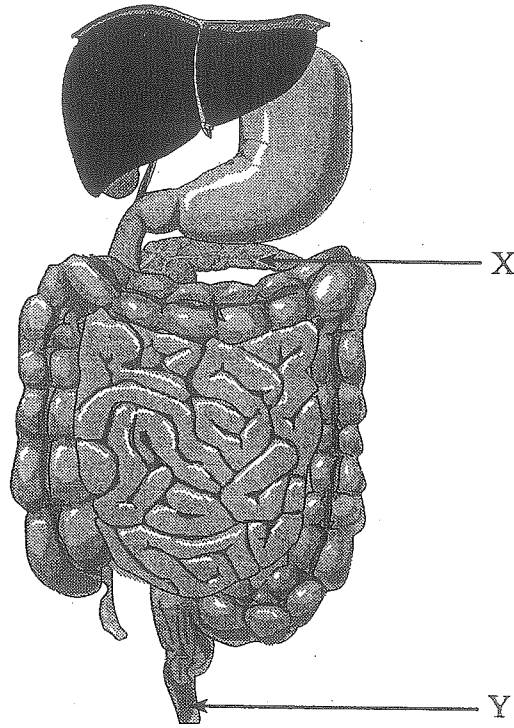
Enzyme: _____

Substrate: _____

Use the following diagram to answer question 79.



Use the following diagram to answer question 80.



80 a) Describe three different ways that X aids in digestion. (3 marks)

- i) _____

- ii) _____

- iii) _____

b) What is the role of Y in the digestive system? (1 mark)

81. Explain how the liver is involved in each of the following processes.

(2 marks)

digestion of fat:

maintenance of blood glucose levels:

(2 marks)

maintenance of healthy blood:

(2 marks)

82. Identify four substances produced by the pancreas and give one function of each.

(8 marks: 1 mark each for substance; 1 mark each for function)

Substance 1: _____

Function: _____

Substance 2: _____

Function: _____

Substance 3: _____

Function: _____

Substance 4: _____

Function: _____

83. Describe how the small intestine is specialized for digestion and absorption.

Digestion:

(2 marks)

Absorption:

(2 marks)

84. The following substances were isolated from organs found in the digestive system. Name the organ in which each substance was produced and give one function of the substance.

(4 marks)

SUBSTANCE	ORGAN WHERE PRODUCED	FUNCTION
pepsin		
nuclease		