

Biology Worksheet

Chapter 6: Nutrition in Humans

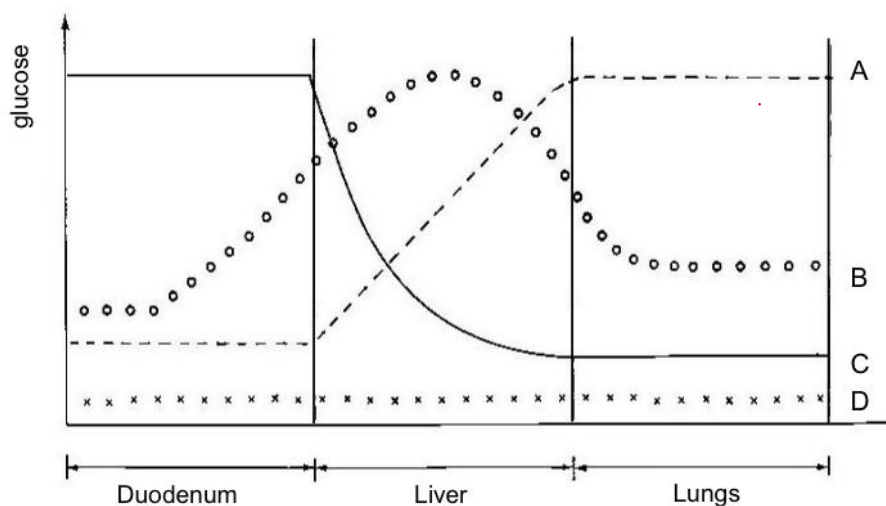
Name: _____ () Class : _____ Date : _____

Section A Multiple Choice Questions

Choose the **most appropriate** answer and write it in the corresponding box below.

Qn	1	2	3	4	5	6	7	8	9	10
Ans										
Qn	11	12	13	14	15	16				
Ans										

- 1 Which of the following curves best represents the change in the glucose level of blood flowing through the following organs of a man who has starved for eight hours?



- 2 The acidic liquid in the stomach contains _____.
A pepsin and mucus **C** maltase and pepsin
B bile and pepsinogen **D** lipase and trypsin
- 3 If the pancreatic duct of a mammal became blocked, which symptom would the animal show?
A increased bile in the blood **C** decreased blood insulin level
B increased blood sugar level **D** decreased protein digestion
- 4 Pancreatic juice contains enzymes, which digest _____.
A proteins and carbohydrates **C** fats and carbohydrates
B proteins and fats **D** proteins, fats and carbohydrates

5 The secretions listed below are all active in the mammalian alimentary canal.

- (1) Saliva
- (2) Gastric juice
- (3) Bile
- (4) Pancreatic juice
- (5) Intestinal juice

Which secretions contain the enzyme amylase?

- | | | | |
|----------|--------|----------|--------------|
| A | 1 only | C | 1 and 4 only |
| B | 2 only | D | 1 and 5 only |

6 What would happen if a person's bile duct became blocked?

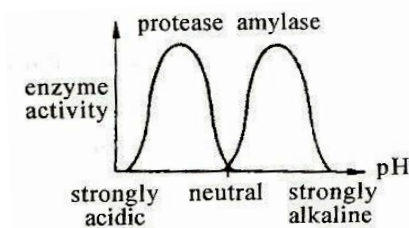
- A** Fat digestion would be reduced.
- B** Fat digestion would stop.
- C** Manufacture of bile would stop.
- D** Protein digestion would stop.

7 Which region of the alimentary canal has the greatest surface area for absorption of food molecules?

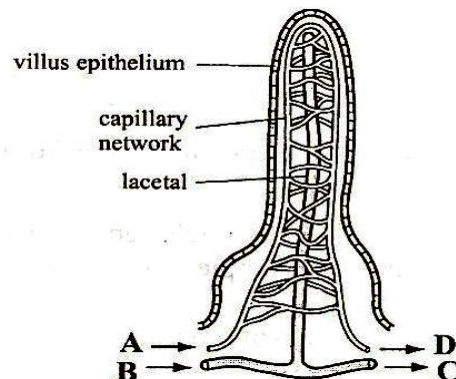
- | | | | |
|----------|----------|----------|---------|
| A | colon | C | ileum |
| B | duodenum | D | stomach |

8 The diagram shows the effect of pH on the activity of two enzymes in the human gut. In which regions of the alimentary canal would these enzymes be most active?

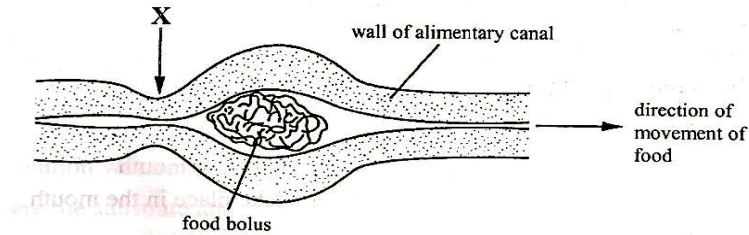
- | | Protease | Amylase |
|----------|-----------------|----------------|
| A | colon | stomach |
| B | duodenum | colon |
| C | duodenum | stomach |
| D | stomach | duodenum |



9 The diagram shows the structure of a villus in the small intestine. The arrows show the direction of flow of fluids. After a meal of fried chicken, where will fats be present in the largest amounts?



- 10 The diagram shows some food moving along the alimentary canal, by peristalsis.

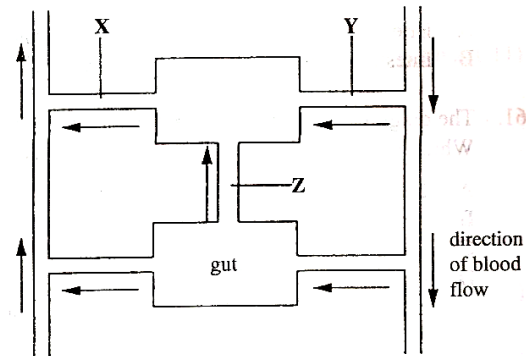


In which state are the muscles in the wall of the alimentary canal at point X?

	circular muscles	longitudinal muscles
A	contracting	contracting
B	contracting	relaxing
C	relaxing	contracting
D	relaxing	relaxing

- 11 The diagram shows the blood supply to the liver and gut. What are X, Y and Z?

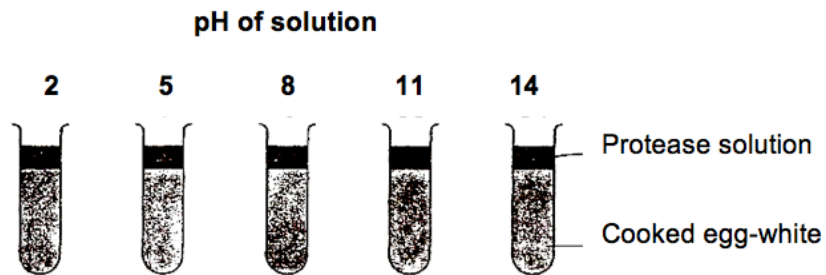
	artery	portal vein	vein
A	X	Y	Z
B	Y	Z	X
C	Z	X	Y
D	Y	X	Z



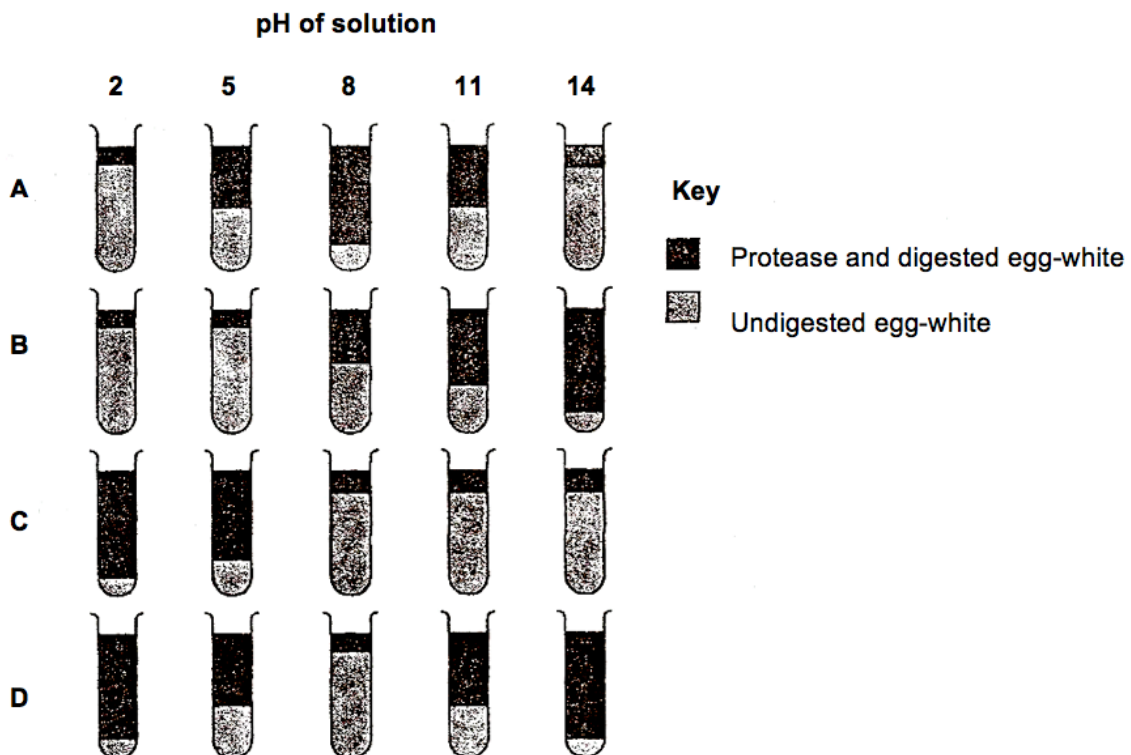
- 12 Where in the alimentary canal is most water absorbed?

- A colon
- B ileum
- C oesophagus
- D stomach

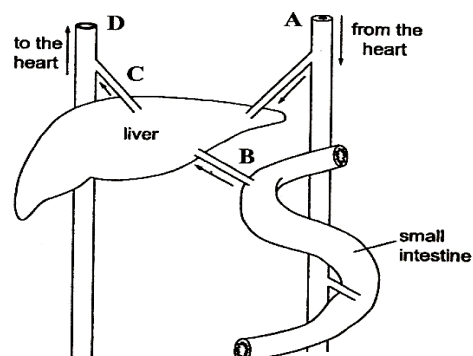
- 13 Five tubes containing cooked egg-white are set up as shown. Protease solutions of different pH are added to each tube.



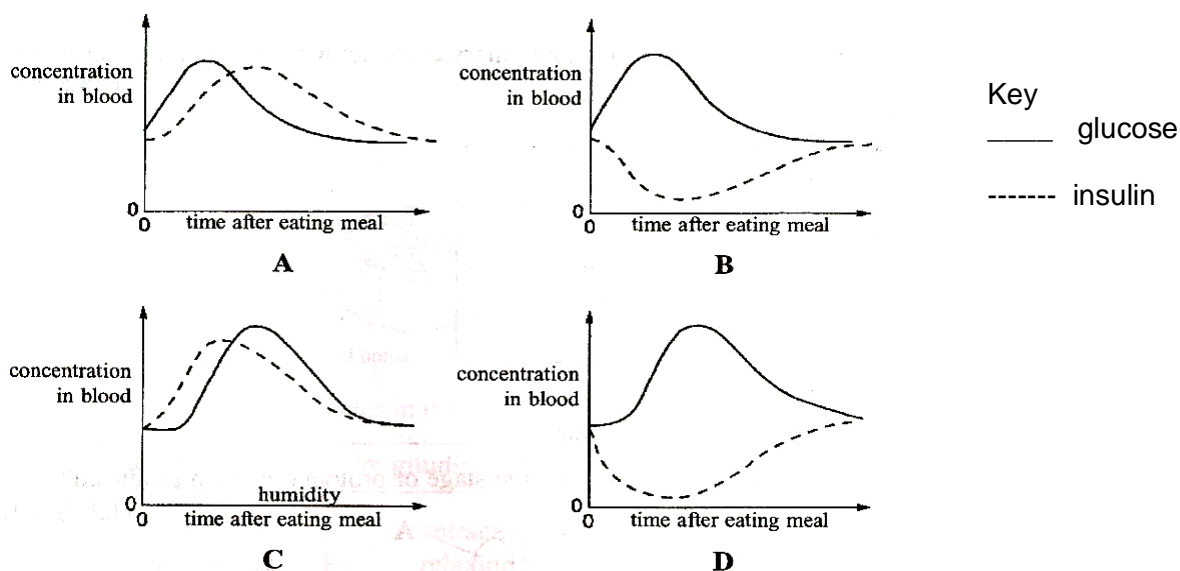
Which diagram shows the result of this experiment for a protease from the stomach?



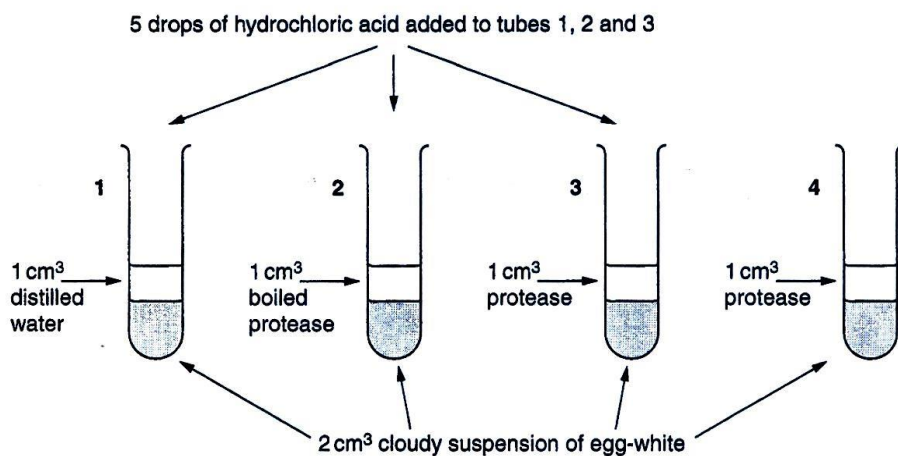
- 14 The diagram shows part of the circulatory system. After a meal, which blood vessel will contain blood with the most glucose?



- 15 The graphs show the concentrations of glucose and insulin in the blood of a healthy person. Which graph shows the changes expected after a meal containing starch?



- 16 Four test-tubes are set up as shown.

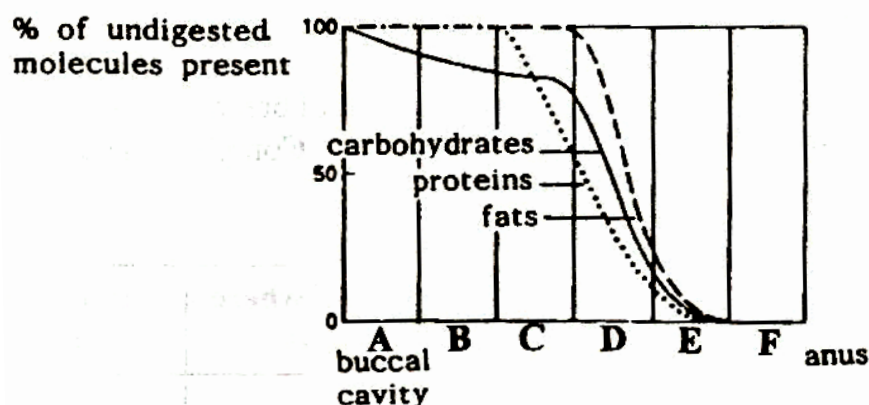


All four tubes are then placed in a water-bath at 37 °C for 20 minutes. What is the result?

tube	1	2	3	4
A	clear	clear	clear	clear
B	clear	cloudy	cloudy	clear
C	cloudy	cloudy	clear	cloudy
D	cloudy	clear	cloudy	clear

Section B Structured Questions

- 1 The figure below shows the event to which carbohydrates (—), proteins (.....) and fats (----) are digested as food passes through the alimentary canal of Man. The letters (A to F) represent successive parts of the alimentary canal.



Examine the figure and answer the following questions.

- (a) Name the parts **B** and **C**.

B _____ **C** _____

- (b) (i) What brings about the start of digestion of carbohydrate molecules in part **A** of the gut?

- (ii) Explain why the percentage of undigested protein molecules suddenly decreases in part **C** of the gut.

- (iii) In which part of the gut (**A** to **F**) does most digestion occur?

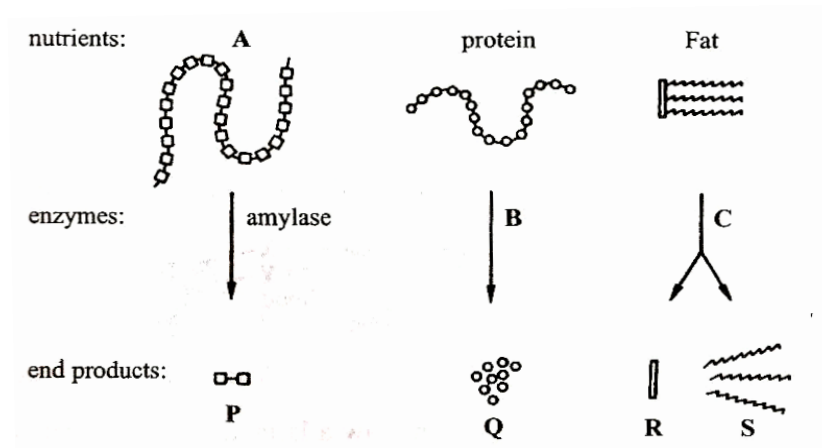
- (c) (i) In which part of the gut (**A** to **F**) would lipase be present and on which class of food would it act?

Part _____

Food _____

- (ii) In which part of the gut (**A** to **F**) is most water reabsorbed?

2 The figures represent the digestion of three nutrients.



(a) Identify each of the following:

(i) Nutrient **A** _____

(ii) Enzymes **B** _____

C _____

(iii) End products **P** _____

Q _____

R _____

S _____

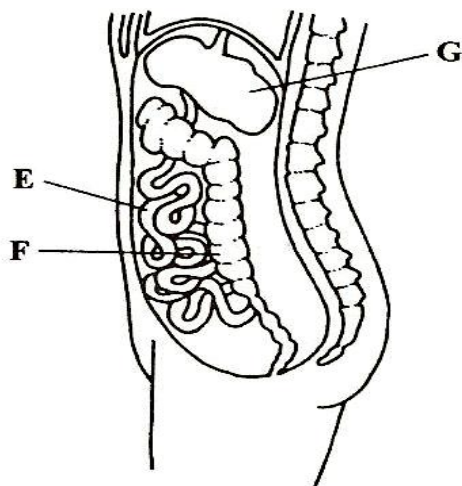
(b) Name a region of the alimentary canal where each of the enzymes **B** and **C** may be found.

Enzyme **B** _____

Enzyme **C** _____

(c) Explain why it is necessary, during digestion, to change the nutrient molecules in the way shown in the figure.

- 3 The figure shows a side view of the alimentary canal within a person's abdomen.



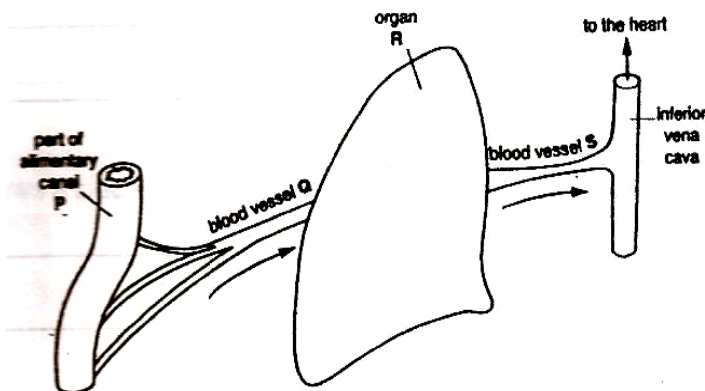
- (a) On the figure, draw in the correct position and label the liver.
- (b) Complete the table below, identifying parts **E** and **F**. For each part, state one function and one structural feature which adapts it to the function you have mentioned.

Part	Name	Function	Structural feature
E			
F			

- (c) (i) What type of food is digested in the organ labelled **G**?

- (ii) Describe the role of organ **G** in the process of digestion.

- 4 The figure shows a blood vessel (Q) linking a part of the alimentary canal (P) with an organ (R) in the abdomen.



- (a) (i) Identify **P**, **Q** and **R**.

P _____ **Q** _____ **R** _____

- (ii) What type of blood vessel is **S**? _____

- (b) State the changes in the composition of the blood in **Q** shortly after a meal has been eaten which contains protein and carbohydrate.

An athlete is about to take part in a race.

- (c) (i) How do the concentrations of materials in blood vessel **S** differ from those in blood vessel **Q**?

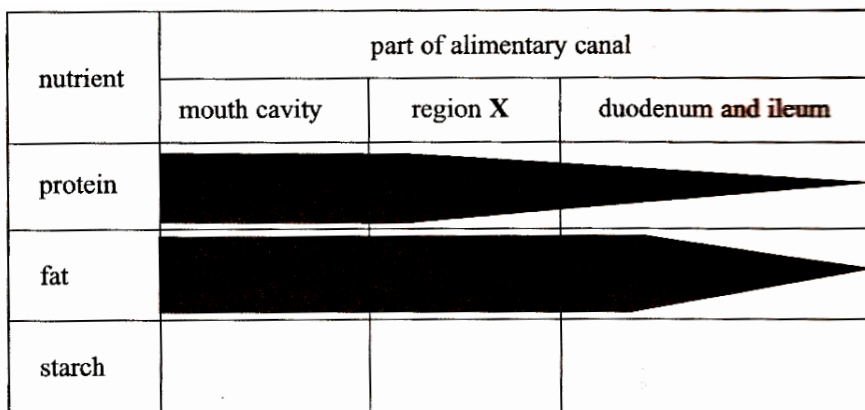
- (ii) Explain how the differences in concentration of the materials have occurred.

- 5 Cellulose is an insoluble carbohydrate. Many herbivorous mammals have a large appendix containing bacteria, which digest the cellulose cell walls of plants.

(a) Suggest the likely end-product of cellulose digestion.

(b) Explain what happens to cellulose in the human alimentary canal.

- 6 The figure shows how the amounts of different nutrients in food change as the food passes along the alimentary canal. The width of each band indicates the amount of nutrient.



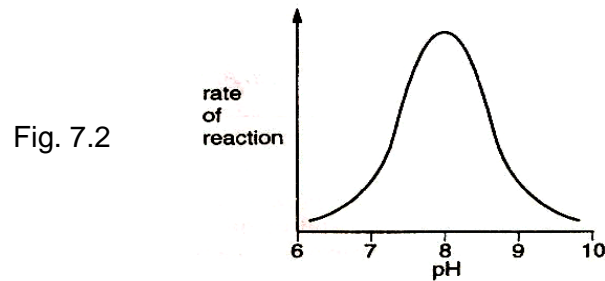
(a) Identify region X. _____

(b) Using the figure, and your own knowledge, explain what happens to protein from when it enters the mouth to when it leaves the ileum.

(c) Explain why the amounts of fat does not begin to decrease immediately after entering the duodenum.

(d) Complete the figure on pg 30 to show what happens to starch from when it enters the mouth to when it leaves the ileum.

- 7 Complex carbohydrates are digested in the duodenum. Fig. 7.2 shows the effect of pH on the enzyme that controls this reaction.

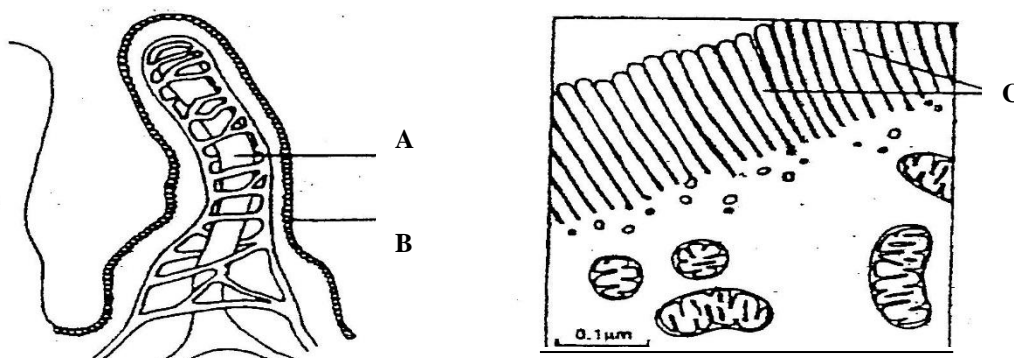


(a) Name this enzyme. _____

(b) Explain how the optimum pH for this enzyme is maintained in the duodenum.

Section C Free Response Questions

1. (a) Explain what is meant by the following terms:
- (i) ingestion;
 - (ii) digestion;
 - (iii) absorption.
- [5]
- (b) Where, in a mammal, are the following substances stored, and what part does each play in a mammal's metabolism?
- (i) carbohydrates
 - (ii) fats
- [5]
2. (a) The diagrams below show a transverse section through a mammalian ileum and the drawing of an electro-micrograph of part of structure **B**.



Drawing of electro-micrograph
of part of structure **B**

- (i) Name the parts labelled **A** to **C**.
 - (ii) Briefly describe how **three** features, shown in this diagram, enable the ileum to carry out its function of absorption.
- [5]
- (b) Explain the problems that might arise in the following scenarios and suggest possible changes that should be made to the person's diet.
- (i) A person's gall bladder was surgically removed.
 - (ii) Part of a person's colon was surgically removed due to colorectal cancer.
- [5]