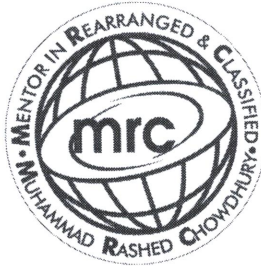


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BIOLOGY-0610/31, 32, 33
TOPIC- ANIMAL NUTRITION
(ALIMENTARY CANAL)

1 Fig. 1.1 shows part of the human digestive system.

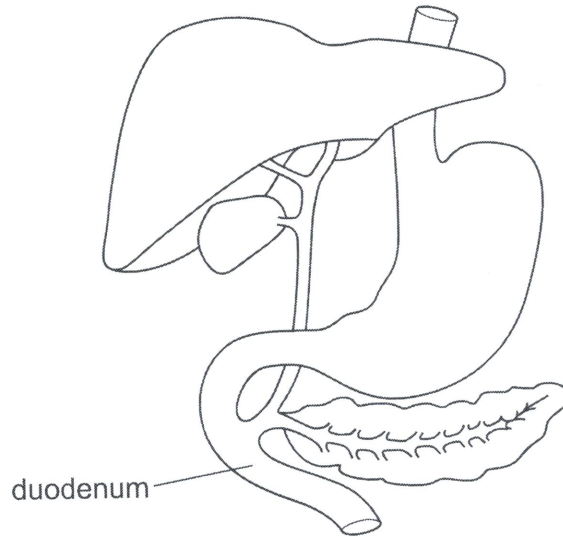


Fig. 1.1

(a) On Fig. 1.1, label the gall bladder, the oesophagus and the pancreas.

Use label lines and the words 'gall bladder', 'oesophagus' and 'pancreas' on Fig. 1.1. [3]

(b) Enzymes are needed to digest the food we eat.

(i) Define the term *enzyme*.

.....

.....

.....

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[2]

(ii) Fig. 1.2 shows the activity of three digestive enzymes in solutions of different pH.

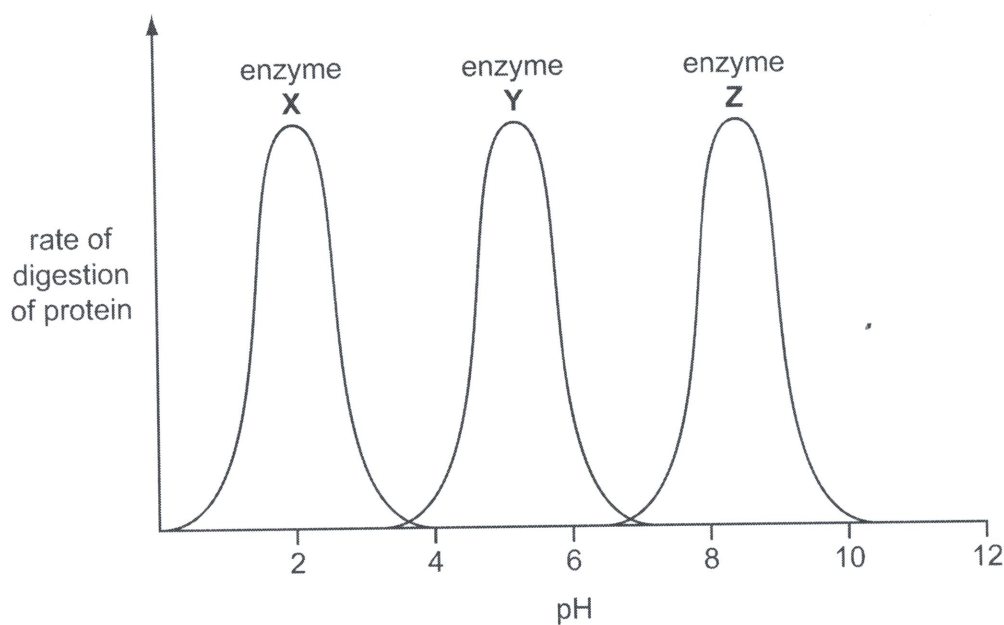


Fig. 1.2

Suggest and explain which one of the three enzymes is most likely to be active in the stomach.

.....
.....
..... [2]

(iii) Amylase is a digestive enzyme found in the duodenum.

Name the food component that amylase digests and name the end product of this digestion.

food component

end product [2]

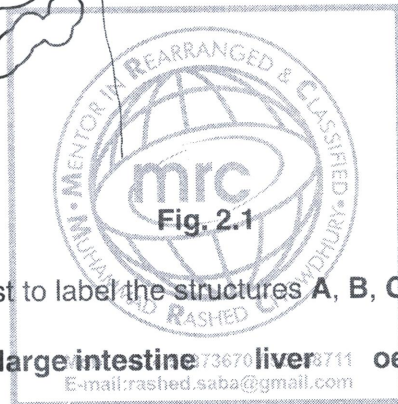
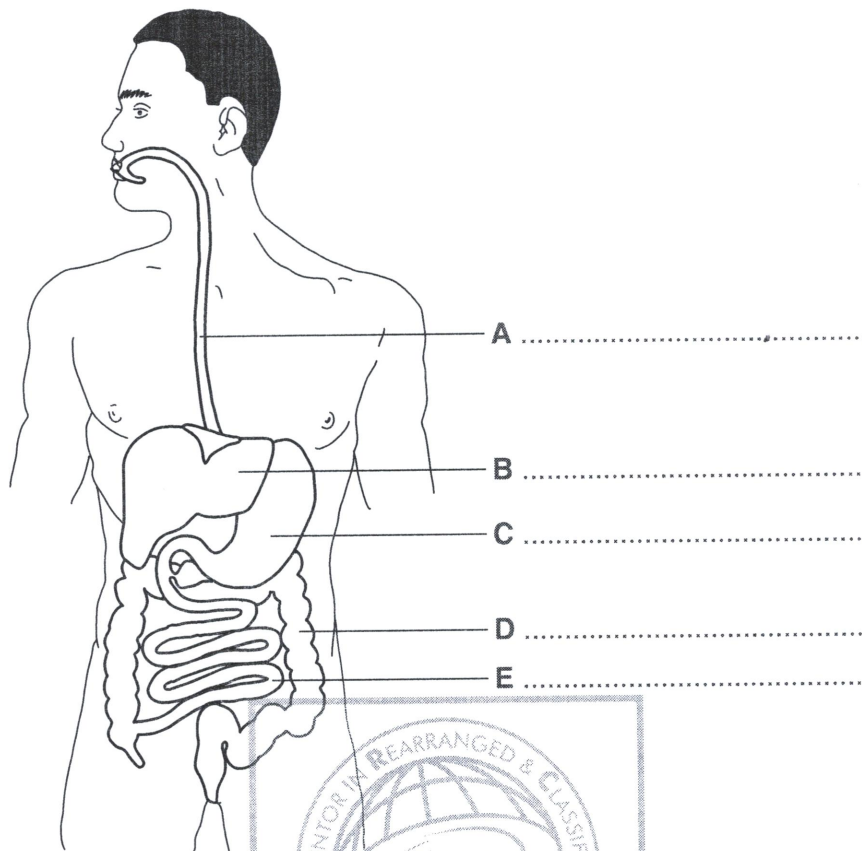
(c) A liquid, produced by the liver, does not contain any digestive enzymes. Name this liquid and explain how it helps in digestion in the duodenum.

.....
.....
.....
..... [3]

[Total: 12]

2 Fig. 2.1 shows the human alimentary canal.

J-V-3



(a) Choose words from the list to label the structures A, B, C, D and E.

- anus large intestine liver oesophagus
pancreas rectum small intestine stomach

Write your answers on Fig. 2.1.

[5]

(b) Two types of muscle move food along the alimentary canal.

(i) Name the two types of muscle.

..... and [1]

(ii) State the name of the process that moves the food.

..... [1]

(iii) Describe how the muscles in (b)(i) move food along the alimentary canal.

.....
.....
..... [2]

- (c) Scientists have invented a radio transmitter, which fits into a small tablet. When this tablet is swallowed, the pH along the alimentary canal is shown on a computer.

Fig. 2.2 shows the changes in pH as the tablet travels along the alimentary canal.

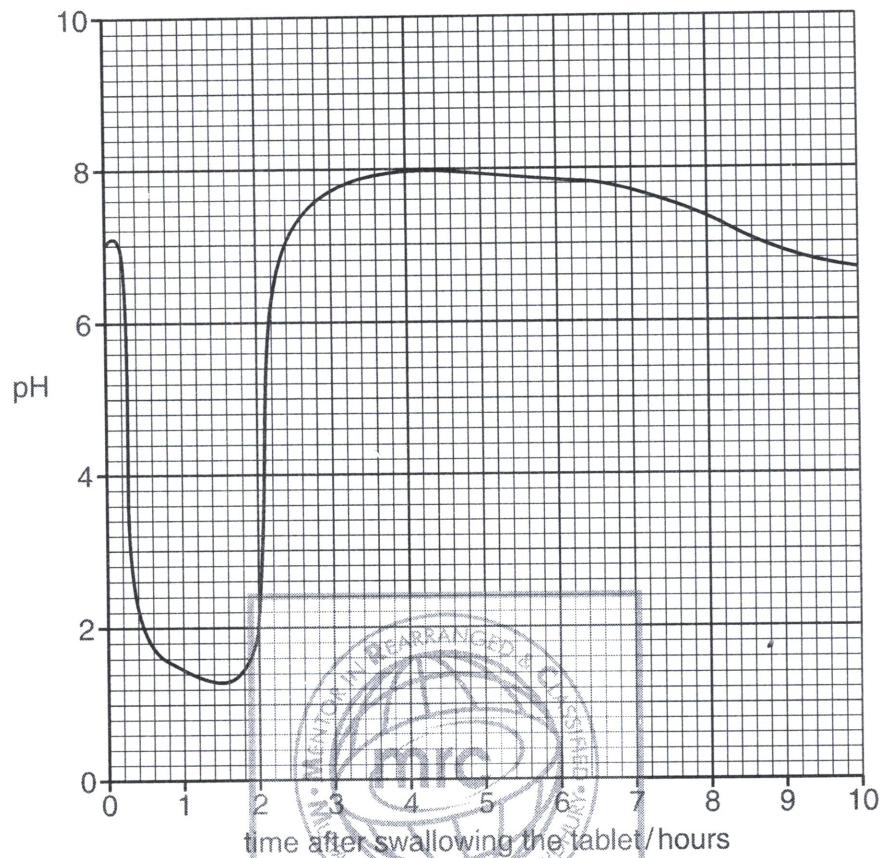


Fig. 2.2

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- (i) On Fig. 2.2 write the letter **X** to show when the tablet was inside the stomach. [1]

- (ii) Give a reason for your answer to (c)(i).

.....
.....[1]

- (iii) State the highest pH that was detected by the tablet.[1]

- (d) Name the part of the alimentary canal where most of the digested food is absorbed.

.....[1]

[Total: 13]

3 (a) Define the term *enzyme*.

.....
.....
.....
..... [2]

(b) (i) Fig. 3.1 shows a diagram of part of the human alimentary canal and associated organs.
Name the structures labelled **A**, **B**, **C** and **D**.

Write your answers on Fig. 3.1.

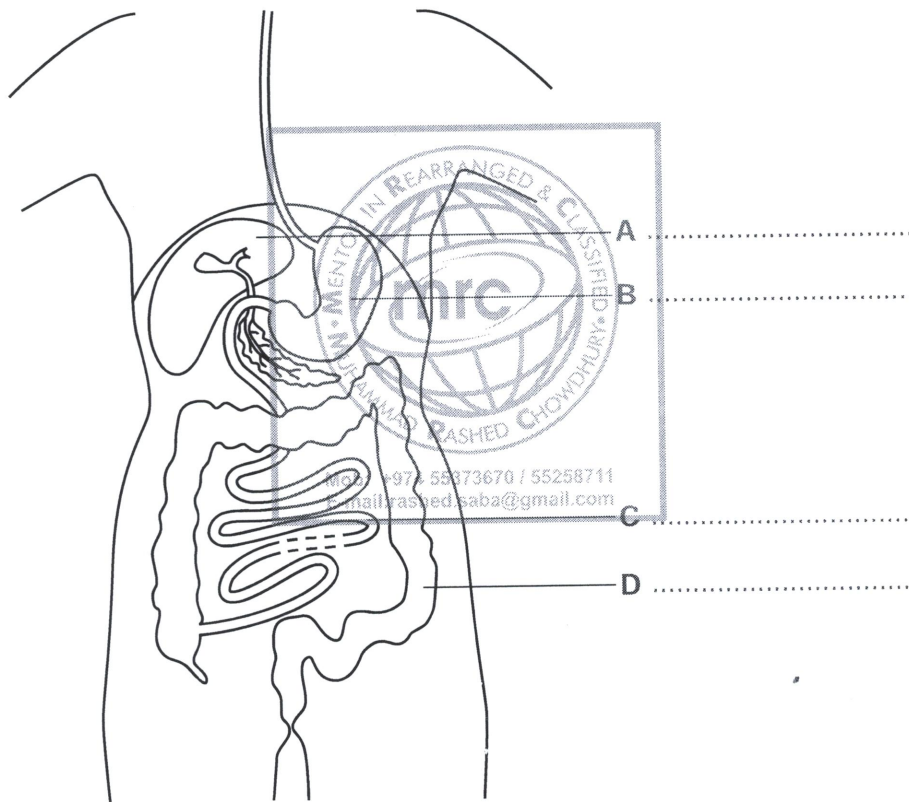


Fig. 3.1

[4]

- (ii) Fig. 3.2 also shows a diagram of part of the human alimentary canal and associated organs.

On Fig. 3.2, draw label lines with letters to show:

- E where hydrochloric acid is made
- F where bile is made
- G where amylase is made
- H where egestion occurs.

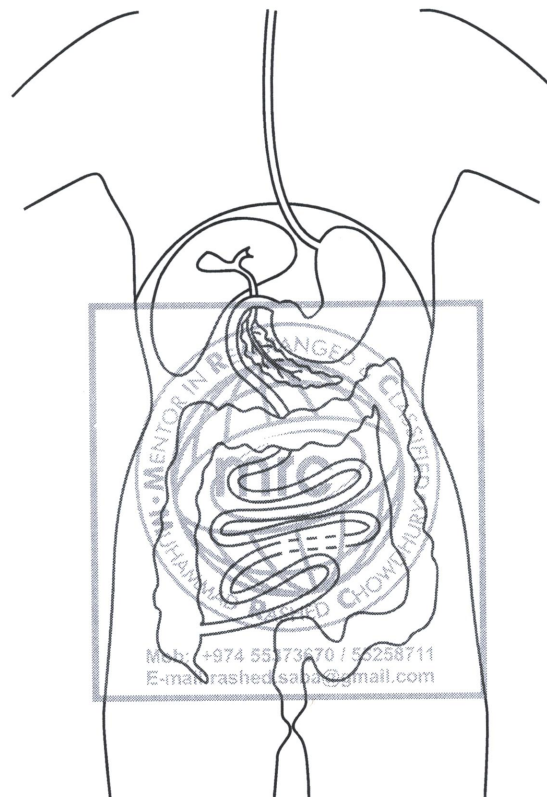


Fig. 3.2

[4]

- (c) (i) State where digested food is absorbed.

.....
..... [1]

(ii) Digestion of carbohydrate produces glucose.

Describe the absorption of glucose.

.....

.....

.....

.....

..... [2]

[Total: 13]



4 This question is about chemical digestion.

(a) Before food can be absorbed into the body it needs to be digested.

Define the term *chemical digestion*.

.....
.....
.....[2]

(b) Pasta contains starch, which is a carbohydrate.

(i) Name the enzyme that breaks down starch.

.....[1]

(ii) Name the substance formed when starch is digested.

.....[1]

(c) Fig. 4.1 is a partially labelled diagram of the human alimentary canal.

Some parts of the alimentary canal have been labelled but have not been named.

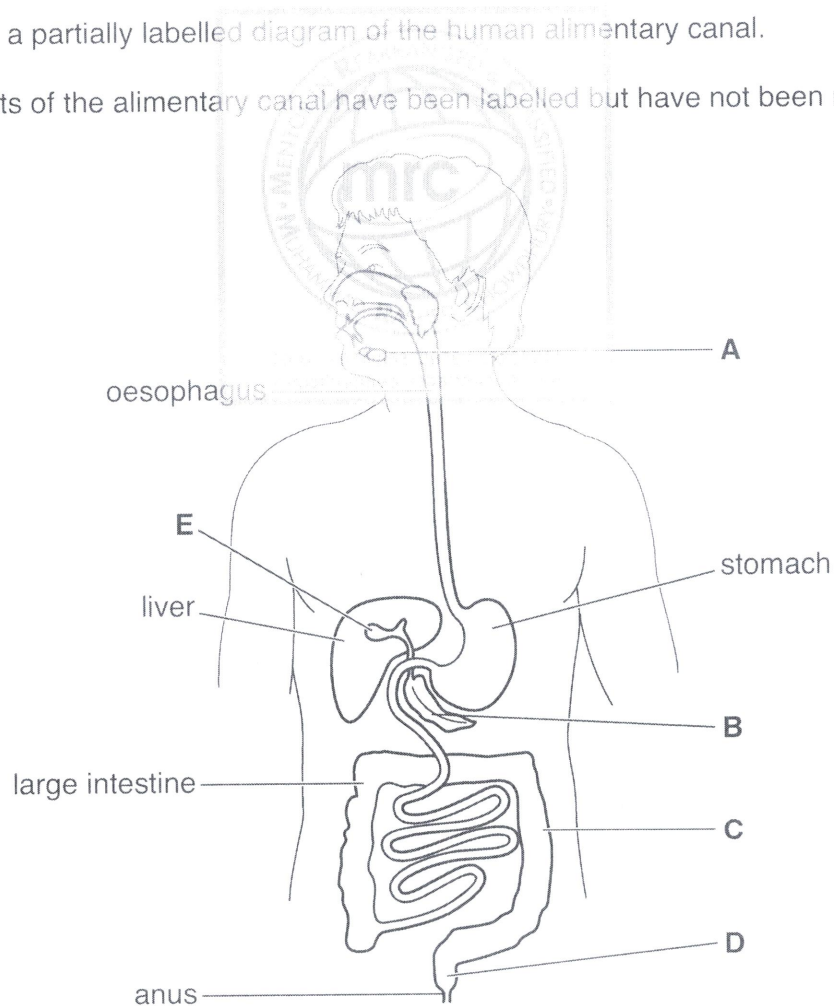


Fig. 4.1

(i) Identify the **two** letters on Fig. 4.1 that show the structures which produce enzymes that break down starch.

1

2

[2]

(ii) State the name of the part of the alimentary canal responsible for the absorption of digested food.

.....[1]

(d) State **two** functions of the stomach.

1

2

[2]

[Total: 9]



5 (a) Fig. 5.1 shows the human breathing system.

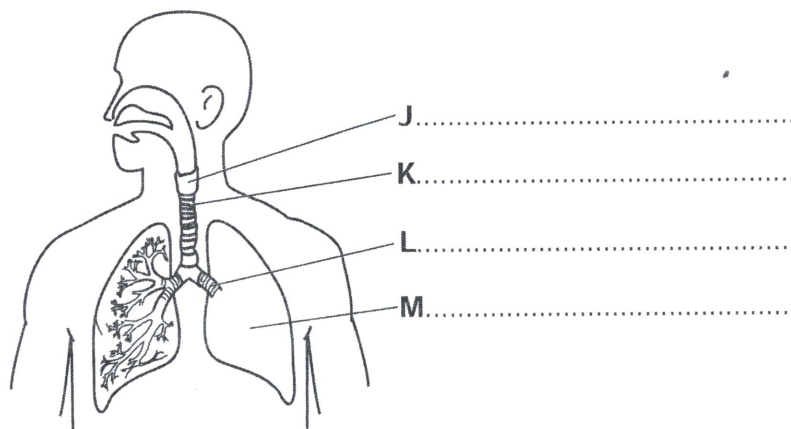


Fig. 5.1

Name the structures labelled J, K, L and M.

Write your answers on Fig. 5.1.

[4]

(b) Fig. 5.2 shows four sections through groups of alveoli and their blood capillaries.

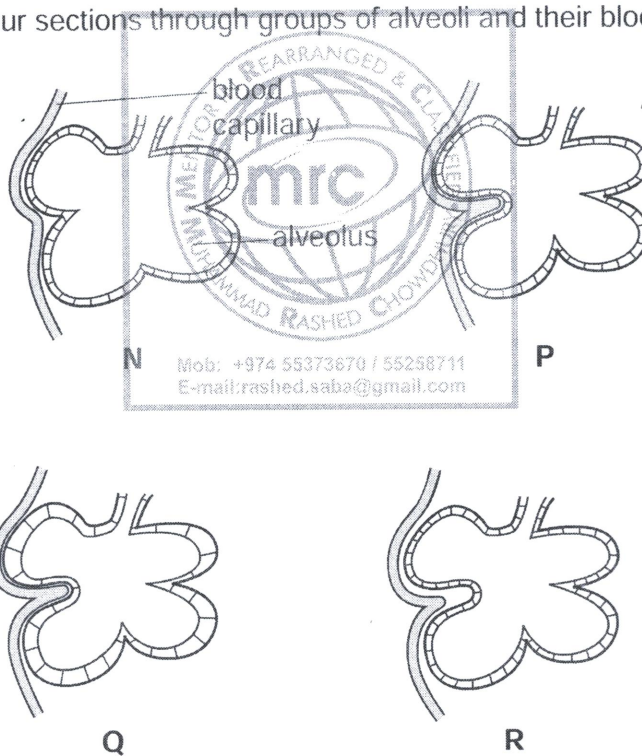


Fig. 5.2

State which diagram, N, P, Q or R, shows the most efficient gas exchange surface.

Give **one** reason for your answer.

most efficient gas exchange surface

reason

.....

[2]

(c) (i) State the word equation for aerobic respiration in cells.

..... + → + [2]

(ii) Respiration releases energy.

Outline **three** uses of this energy in the human body.

1

.....

2

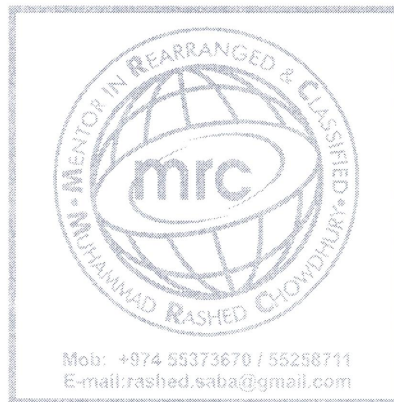
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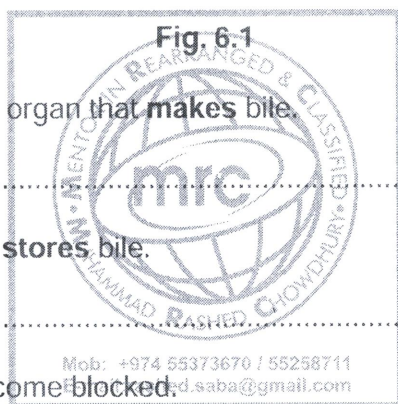
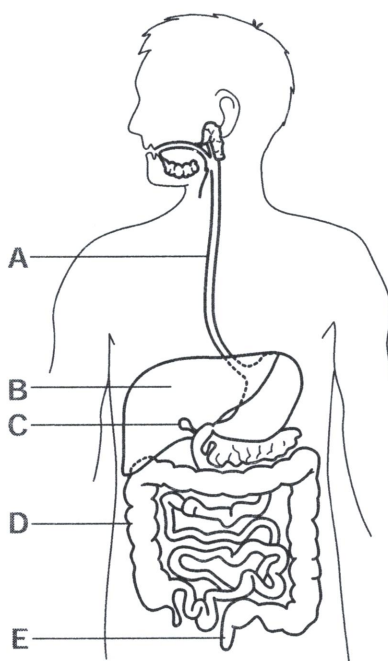
.....

[3]

[Total: 11]



6 Fig. 6.1 shows the human digestive system.



- (a) (i) State the letter of the organ that makes bile.
.....[1]
- (ii) Name the organ that stores bile.
.....[1]
- (iii) The bile duct can become blocked.

Explain why this causes problems with the digestion of fats.

.....
.....
.....
.....[2]

(b) Table 6.1 shows information about some parts of the human digestive system.

Table 6.1

organ	pH of digestive juice	enzymes present in digestive juice
salivary gland	7.5	amylase
stomach	2.0	protease
small intestine	8.5	amylase lipase protease

(i) Name **two** parts of the digestive system where amino acids could be produced by digestion.

- 1
- 2 [2]

(ii) Suggest **two** reasons why starch is not digested in the stomach.

- 1
- 2 [2]

(c) (i) The material entering the colon is liquid but the faeces are usually much more solid.

State how this happens.

-
- [1]

(ii) Name the component of a balanced diet which is necessary for the correct formation of faeces.

- [1]

(iii) Name a disorder which can result from a shortage of the component identified in (c)(ii).

- [1]

[Total: 11]

7 Fig. 7.1 shows the human alimentary canal and some of the organs associated with it.

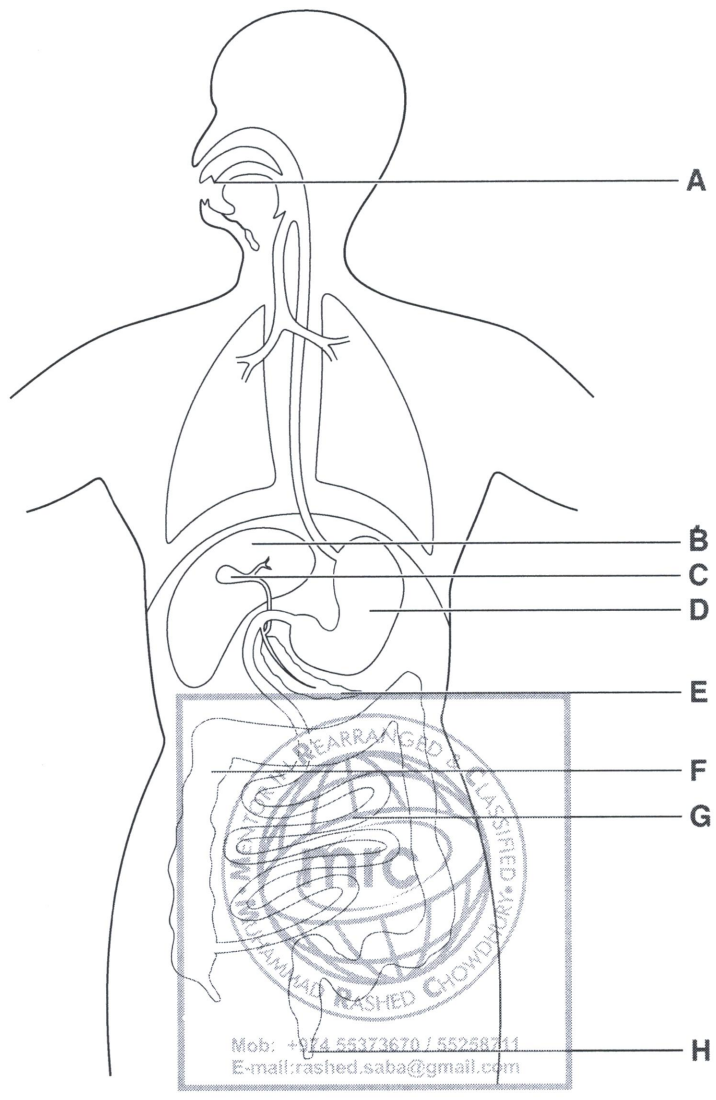


Fig. 7.1

(a) Use letters from Fig. 7.1 to identify which structure carries out a particular function. Write your answers in Table 7.1.

Table 7.1

function	letter
ingestion of food	
bile storage	
fat digestion	
egestion	

[4]

(b) Name the process which moves food from D to F.

..... [1]

(c) A student investigated the digestion of fats by the enzyme lipase.

He found that as lipase digested the fats, the pH of the solution changed from pH 8 to pH 6.

(i) Explain why the digestion of fats changed the pH of the solution.

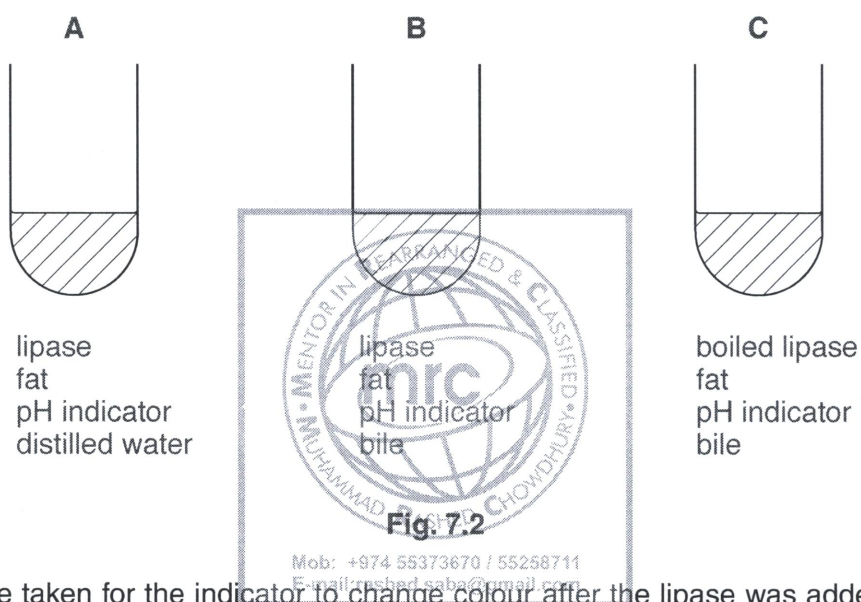
.....

.....

.....

..... [2]

(ii) Fig. 7.2 shows three test-tubes that were set up for this experiment.



The time taken for the indicator to change colour after the lipase was added was measured. The results are shown in Table 7.2.

Table 7.2

test-tube	time taken to change colour/minutes
A	6.5
B	1.0
C	no change after 25 minutes

Explain why the indicator in test-tube **B** changes colour much faster than the indicator in test-tube **A**.

.....

.....

.....

.....

.....

..... [3]

- (d) Some biological washing powders contain lipase. Instructions on the packet state that biological washing powders should be used in warm water but not in very hot water.

Explain why warm water should be used instead of very hot water. Use Fig. 7.2 and Table 7.2 to help with your answer.

.....

.....

.....

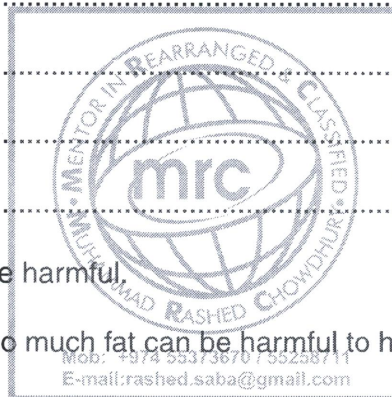
..... [2]

- (e) Eating too much fat can be harmful.

State **one** way in which too much fat can be harmful to human health.

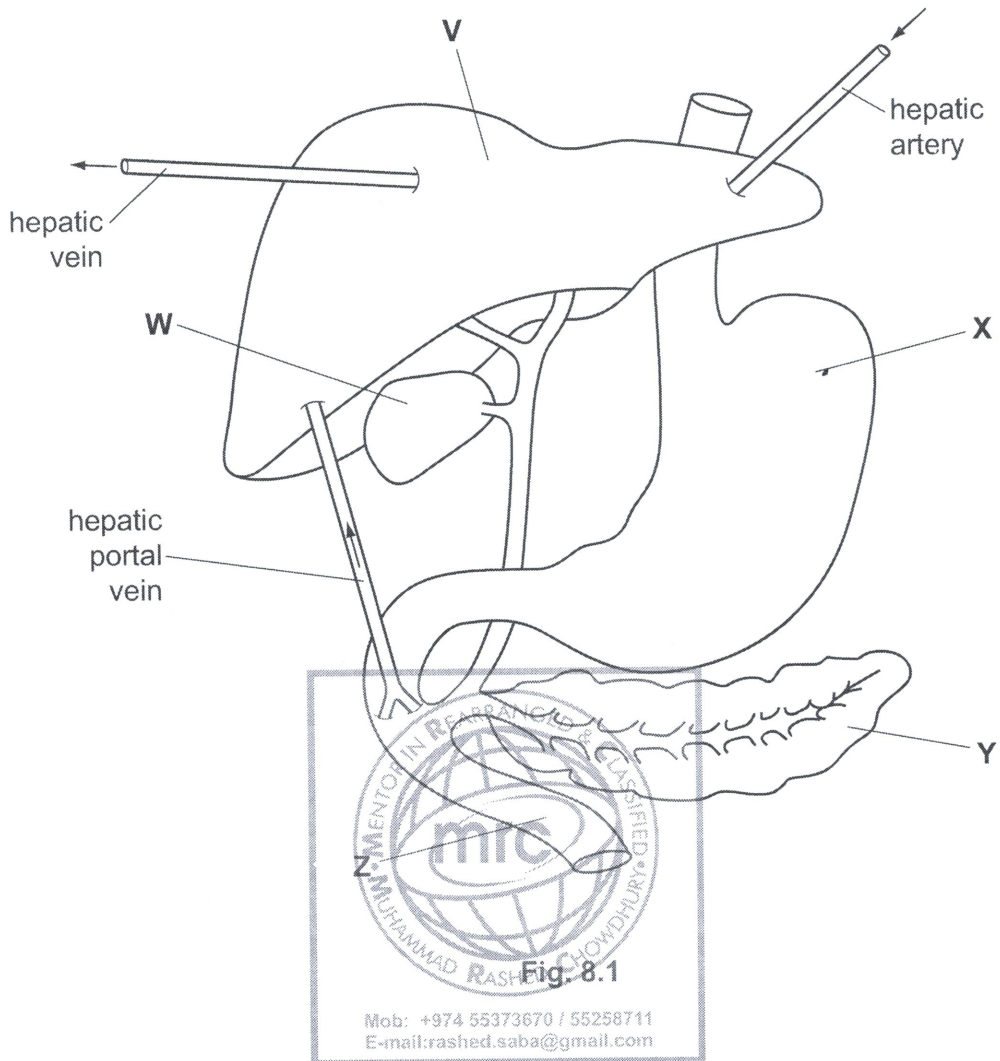
..... [1]

[Total: 13]



7

- 8 Fig. 8.1 shows a diagram of part of the digestive system, associated organs and blood vessels.



- (a) Complete Table 8.1 to identify the named structures.

Table 8.1

name of structure	letter label
duodenum	
gall bladder	
liver	
pancreas	
stomach	

[5]

(b) (i) Name the liquid that is stored in the gall bladder.

..... [1]

(ii) Name a hormone that affects the storage of glycogen in the liver.

..... [1]

(c) Fig. 8.2 shows the rate of digestion of protein by two different enzymes, **A** and **B**, over a range of pH.

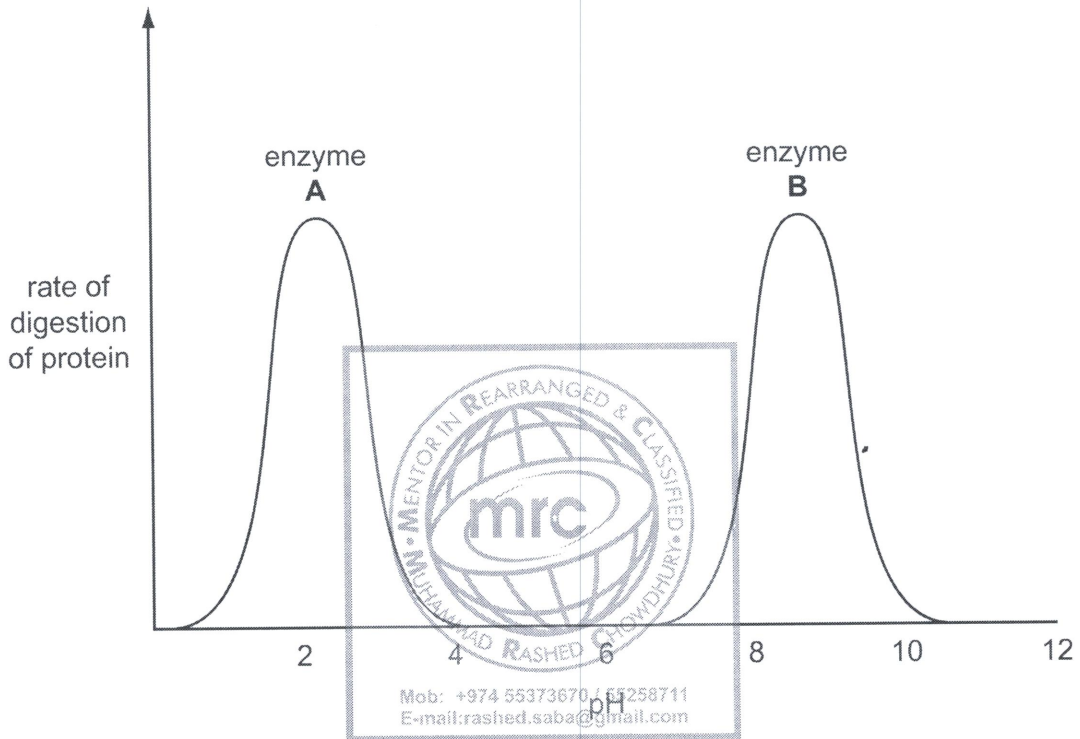


Fig. 8.2

(i) Name the structure, shown in Fig. 8.1, in which enzyme **A** will be most active.

..... [1]

(ii) Name the structure, shown in Fig. 8.1, in which enzyme **B** will be most active.

..... [1]

- (d) (i) Name the blood vessel, shown in Fig. 8.1, that would contain blood with the highest oxygen concentration.

..... [1]

- (ii) Which part of the blood carries oxygen?

..... [1]

- (iii) Name the blood vessel, shown in Fig. 8.1, that would contain blood with the highest urea concentration.

..... [1]

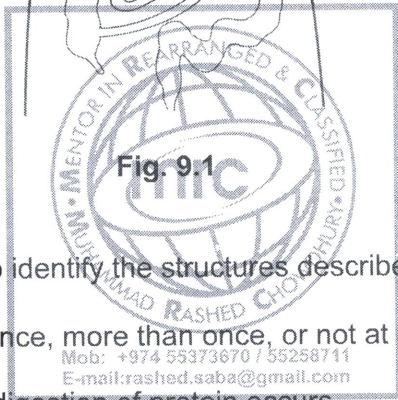
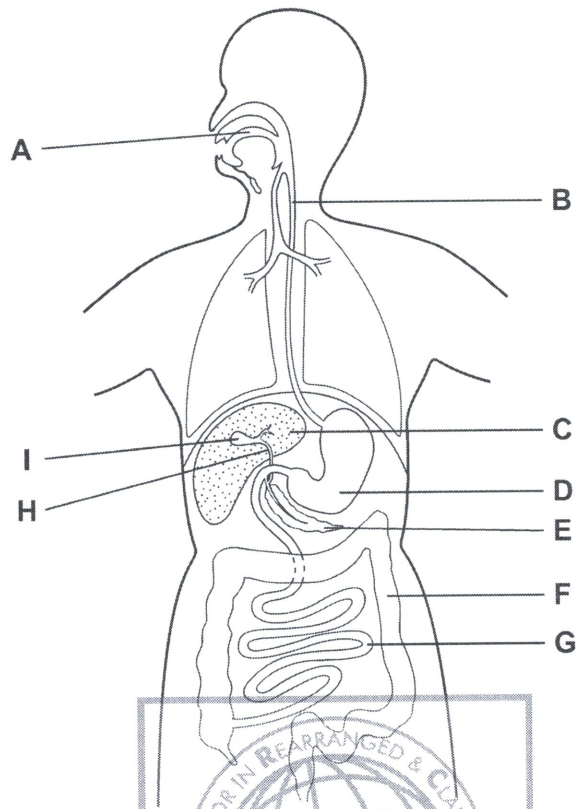
- (iv) Which part of the blood carries urea?

..... [1]

[Total: 13]



9 Fig. 9.1 shows the human digestive system and associated organs.



(a) Use letters from Fig. 9.1 to identify the structures described.

Each letter may be used once, more than once, or not at all.

(i) **One** structure where digestion of protein occurs.

.....

(ii) **One** structure where bile is stored.

.....

(iii) **One** structure where peristalsis happens.

.....

(iv) **One** structure where starch digestion occurs.

.....

(v) **One** structure where amino acids are absorbed into the blood.

.....

[5]

(b) State two functions of each of the structures labelled **C** and **E** on Fig. 9.1.

(i) structure **C**

1

2 [2]

(ii) structure **E**

1

2 [2]

[Total: 9]



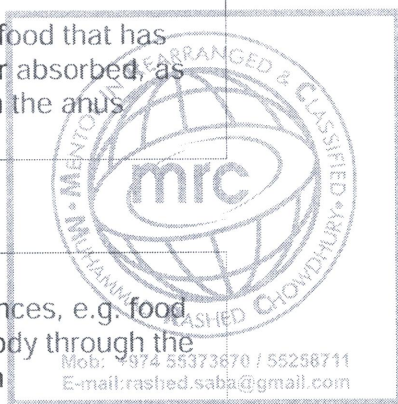
This question is about human nutrition.

The three boxes on the left contain definitions of processes involved in human nutrition.

The four boxes on the right contain the names of some of these processes.

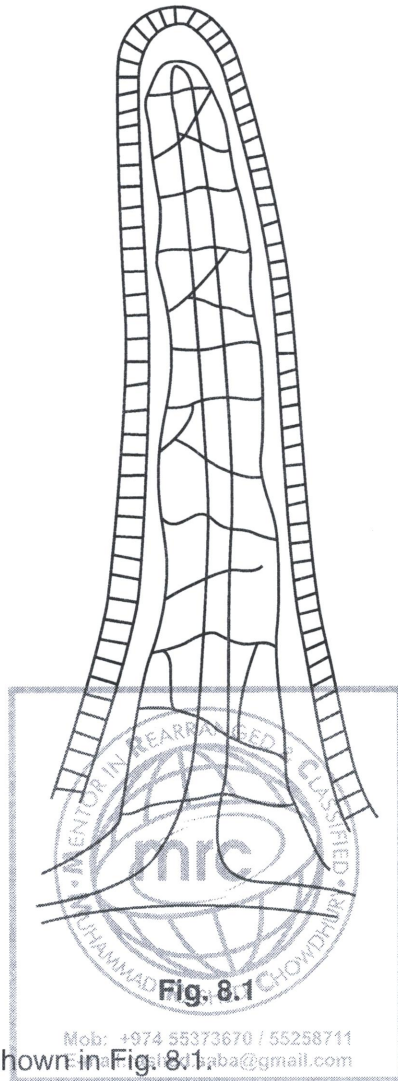
(a) Draw **one** straight line from each definition to join it to the correct process.

definition	process
<p style="text-align: center;">the movement of digested food molecules into the cells of the body where they are used, becoming part of these cells</p>	<p>absorption</p>
<p style="text-align: center;">the passing out of food that has not been digested or absorbed, as faeces, through the anus</p>	<p>assimilation</p>
<p style="text-align: center;">the taking of substances, e.g. food and drink, into the body through the mouth</p>	<p>egestion</p>
	<p>ingestion</p>



[3]

Fig. 8.1 shows a structure found in the wall of the small intestine.



(a) (i) Name the structure shown in Fig. 8.1.

.....[1]

(ii) State **one** function of this structure.

.....
.....[1]

(b) Table 8.1 contains information about the digestion of the three main types of food.

Fill in the spaces to complete Table 8.1.

Table 8.1

food type	enzyme involved in digestion	products of digestion
starch		simple sugar
fat		
protein	protease	

[4]

(c) The products of protein digestion are carried away to the liver.

State **two** ways in which the liver may deal with these products of protein digestion.

1

2



[2]

[Total: 8]

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12 Fig. 2.1 is a diagram of the alimentary canal.

J K-2

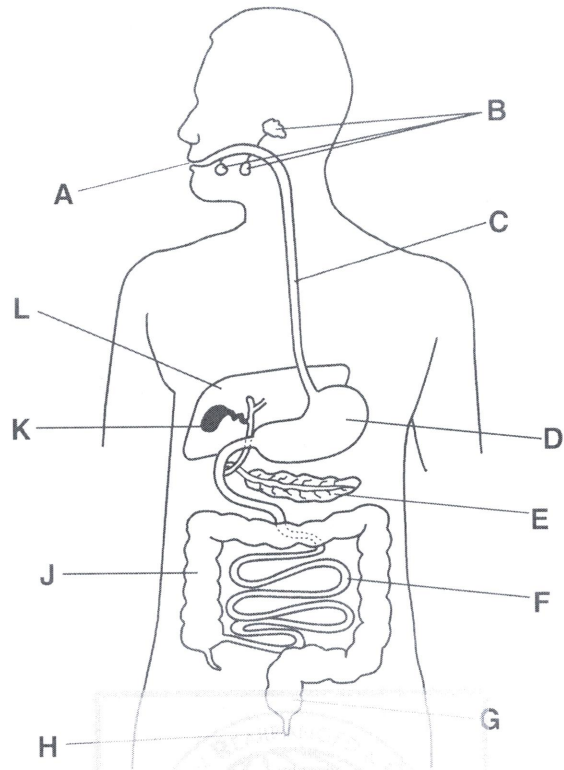


Fig. 2.1

(a) Table 2.1 shows some of the processes that occur in the alimentary canal.

Use the letters in Fig. 2.1 to identify where the processes occur.

Write your answers in Table 2.1.

Table 2.1

process	letter
ingestion	
mechanical digestion	
secretion of protease	
absorption of nutrients	
egestion	

[5]

(b) Chemical digestion is the breakdown of large, insoluble molecules into smaller, soluble molecules. Digestive enzymes such as lipase are used in this process.

(i) Define the term *enzyme*.

.....
.....
.....[2]

(ii) The enzyme lipase breaks down fats.

State the end products of fat digestion.

1
2 [2]

(iii) List the **three** chemical elements that are found in fats.

..... [1]

(iv) Fat is an important component of a balanced diet.

Draw circles around **two** foods that are a good source of fat.



beans butter pasta
oranges rice olive oil

[2]

(v) State the names of **three** components of a balanced diet, other than fat.

1
2
3 [3]

(vi) State **one** use in the body of fat.

.....
.....
..... [1]

[Total: 16]

J

13 (a) Fig. 3.1 shows the digestive system.

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Use

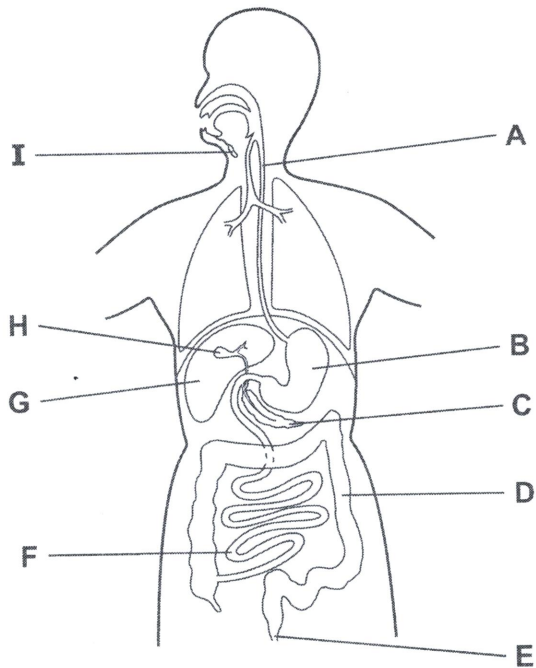


Fig. 3.1

Use the letters from Fig. 3.1 to identify **one** place where each process occurs.

(i) amylase is secreted

letter

[1]

(ii) lipase is secreted

letter

[1]

(iii) protease is secreted

letter

[1]

(iv) bile is formed

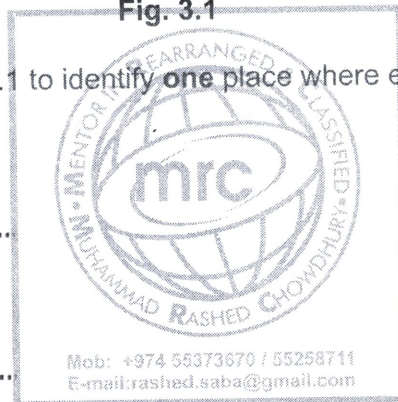
letter

[1]

(v) hydrochloric acid is released

letter

[1]



14 Fig. 6.1 shows a diagram of the alimentary canal.

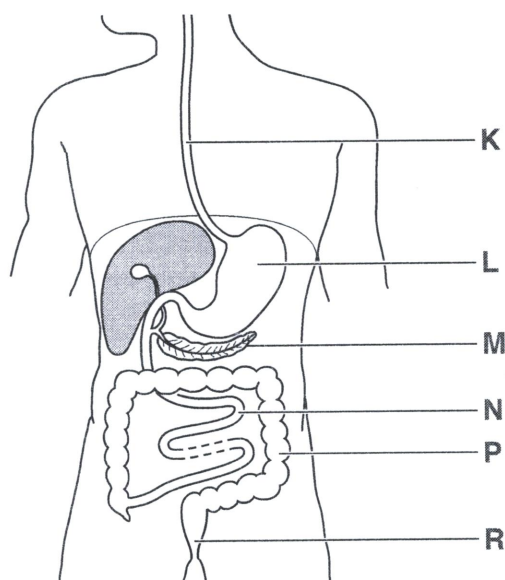


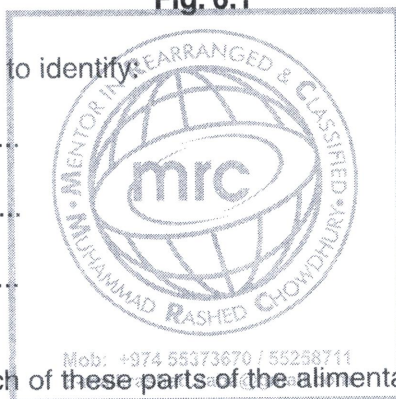
Fig. 6.1

(a) Use the letters on Fig. 6.1 to identify:

the colon,

the pancreas,

the stomach.



[3]

(b) State **one** function for each of these parts of the alimentary canal.

colon

.....

pancreas

.....

stomach

.....

[3]

(c) (i) On Fig. 6.1 draw a line to show where bile is made.
Label it **X**.

[1]

(ii) State the action that bile has on fats in the small intestine.

.....

.....

[1]

(iii) Explain how this action speeds up the digestion of fats.

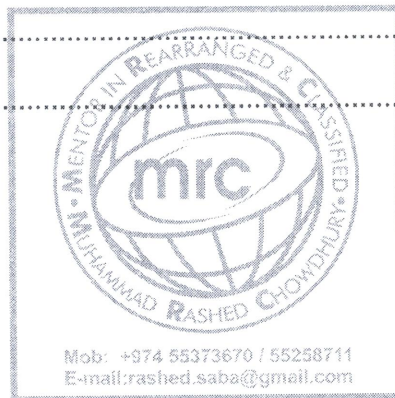
.....
.....
.....
..... [2]

(d) Digested food is absorbed as it passes along the small intestine.

Explain how this absorption takes place.

.....
.....
.....
.....
.....
..... [3]

[Total: 13]



15 The boxes on the left contain some biological terms.

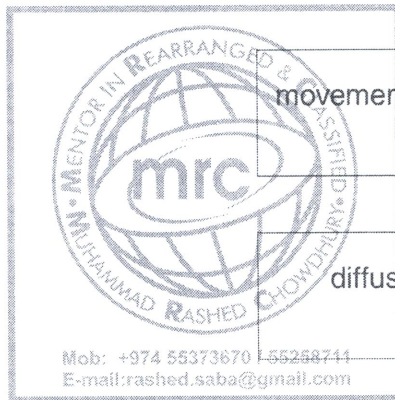
The boxes on the right contain descriptions of these biological terms.

Draw one straight line to join each term with its description.

Draw only six lines.

One has been done for you.

biological term	description
translocation	movement of sucrose and amino acids in phloem
assimilation	removal from organisms of toxic materials, waste products of metabolism and substances in excess
excretion	movement of digested food into a cell where it becomes part of the cell
nutrition	diffusion of water through a partially permeable membrane
ingestion	chemical reaction that breaks down nutrient molecules to release energy
osmosis	taking in, absorbing and using substances for growth and repair of the body
respiration	taking in food through the mouth



[5]

[Total: 5]

16 (a) Using a single line in each case, link each definition to the correct process. 23

definition	process
getting rid of fibre (roughage) from an animal	digestion
large food molecules broken down into simple substances	egestion
taking in food into an animal's alimentary canal	excretion
	ingestion

[3]

(b) Fig. 6.1 shows the alimentary canal and associated organs.

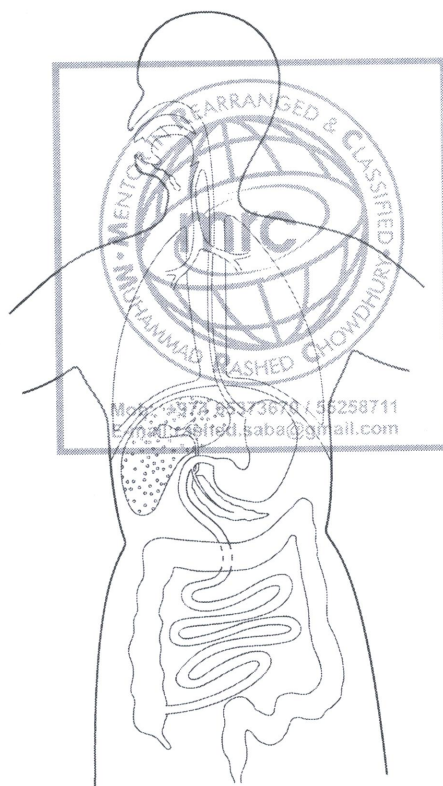


Fig. 6.1

On Fig. 6.1, label the sites of each of the following processes.

- (i) absorption of water [1]
- (ii) bile production [1]
- (iii) glycogen storage [1]
- (iv) lipase production [1]

[Total : 7]

17

The boxes on the left contain the names of biological terms.
The boxes on the right contain the definitions of these biological terms.
Draw **one** straight line from each biological term to the box containing the correct definition.

N-V-2

An example has been done for you.

biological term	definition
assimilation	transmission of genetic information from generation to generation
inheritance	groups of receptor cells responding to specific stimuli
sense organ	the movement of digested food molecules into the cells of the body where they are used, becoming part of the cell
tissue	a group of cells with similar structures working together to perform a shared function
active transport	an animal that gets its energy by eating plants
herbivore	a protein that functions as a biological catalyst
enzyme	movement of particles through a cell membrane from a region of lower concentration to a region of higher concentration using energy from respiration

[5]

[Total: 5]

N-V-I

18 (a) Explain why food has to be digested.

.....
.....
.....
.....
.....
.....
..... [3]

Fig. 8.1 shows a section through the human body.

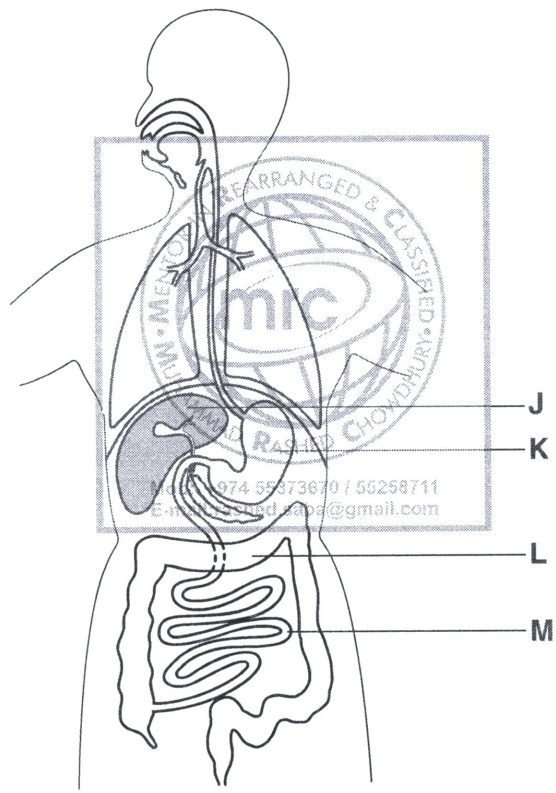


Fig. 8.1

(b) Identify the structures labelled on Fig. 8.1.

Write your answers in Table 8.1.

Table 8.1

structure	name
J	
K	
L	
M	

[4]

(c) In a medical investigation the number of villi in four people was compared. The results given in Table 8.2 show the average number of villi present in 1 cm² of ileum wall.

Table 8.2

person	average number of villi per cm ²
P	4200
Q	4500
R	3500
S	3250

(i) Calculate the difference in the number of villi between person P and person S.

difference = per cm² [1]

(ii) Further investigations showed that person Q could absorb digested food more rapidly than the other people.

Use the information in Table 8.2 to explain this result.

.....

.....

.....

.....

.....

.....

.....

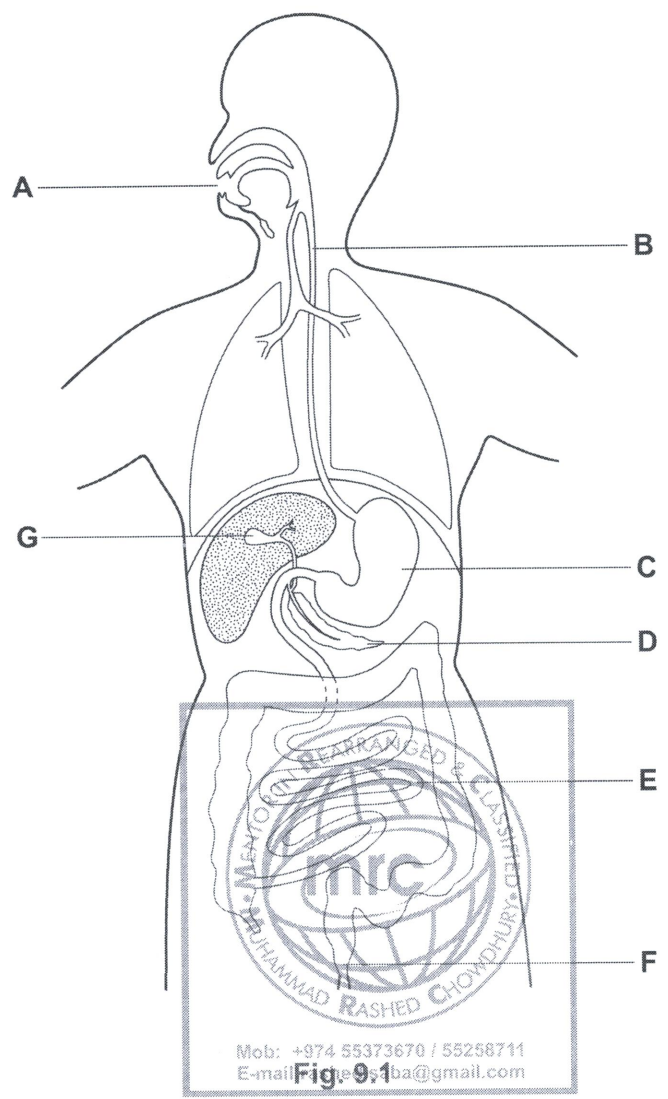
.....[3]

[Total: 11]

N-

19 Fig. 9.1 shows the digestive system.

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Use



20 (a) Complete the following statements by selecting the appropriate letter from Fig. 9.1.

For
Examiner's
Use

(i) Egestion happens at [1]

(ii) Pancreatic juice is formed at [1]

(iii) Villi are present at [1]

(iv) Bile is stored at [1]

(b) The stomach produces hydrochloric acid as well as enzymes. State two functions of this acid in the stomach.

1

.....

2

..... [2]

(c) Describe the roles of the liver in digestion and assimilation.

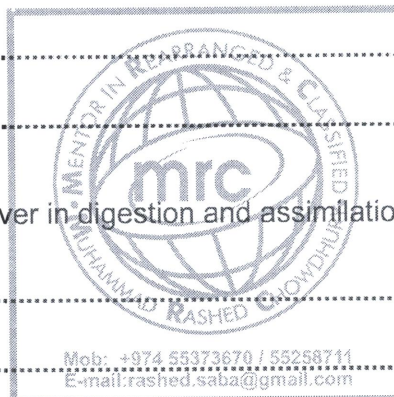
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..... [3]

[Total: 9]



2.1 (a) Define the term *chemical digestion*.

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[3]

Fig. 8.1 shows a diagram of the alimentary canal.

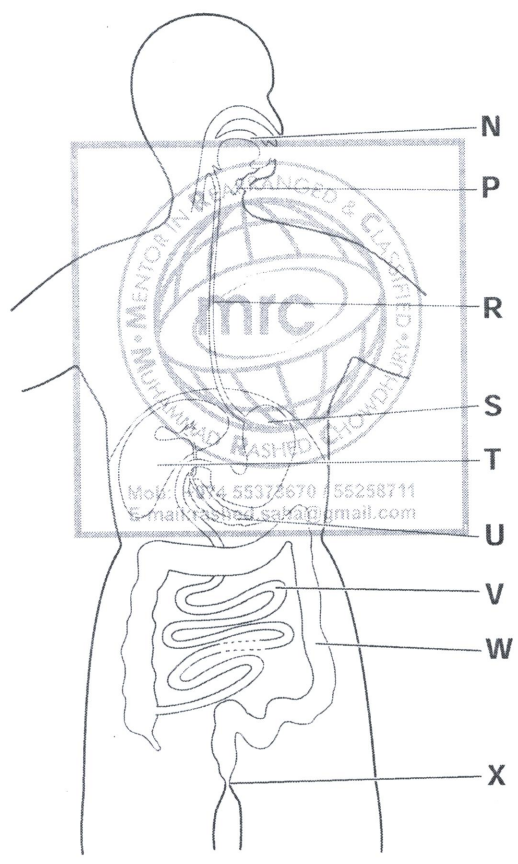


Fig. 8.1

(b) Identify the structures in Fig. 8.1 and use the letters to complete Table 8.1.

An example has been done for you.

Table 8.1

name of structure	letter from Fig. 8.1
salivary gland	P
anus	
large intestine	
mouth	
pancreas	
stomach	

[5]

(c) State **one** function of the liver and **one** function of the small intestine.

function of the liver

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function of the small intestine

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[2]



(d) Describe how the protein in food is digested in the alimentary canal.

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..... [4]

(e) The condition where watery faeces are lost from the body is called diarrhoea.

Outline **one** way in which diarrhoea can be treated.

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..... [1]

[Total: 15]

