

Enzymes

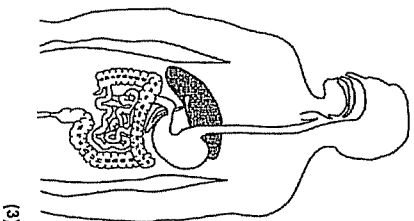
1. The diagram shows the digestive system.

(a) Complete the following sentences about digestive enzymes.

(i) Amylase works in the where it is involved in the digestion of to

(3)

(ii) Lipase works in the where it is involved in the digestion of to



(3)

(b) Which gland produces:

(i) amylase:

(1)

(ii) lipase?

(1)

(Total 8 marks)

2. Enzymes have many uses in the home and in industry.

(a) Which type of organism is used to produce these enzymes?

Tick (✓) one box.

- Mammals
- Microorganisms
- Plants

(1)

(b) Babies may have difficulty digesting proteins in their food. Baby food manufacturers use enzymes to 'pre-digest' the protein in baby food to overcome this difficulty.

Use words from the box to complete the sentences.

amino acids	amylases	proteases	sugars
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(i) Proteins are 'pre-digested' using enzymes called

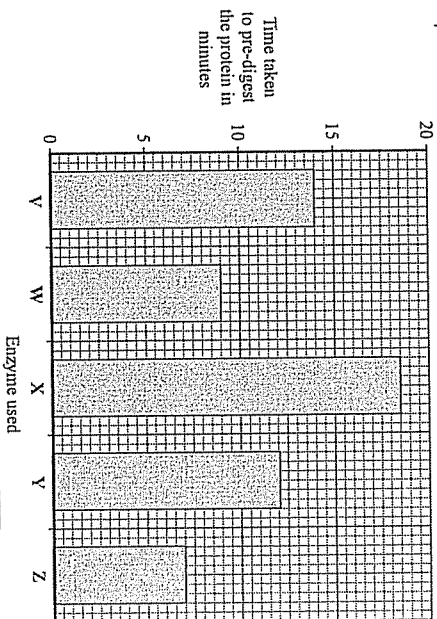
(1)

(ii) This pre-digestion produces

(1)

(c) A baby food manufacturer uses enzyme V to pre-digest protein. He tries four new enzymes, W, X, Y and Z, to see if he can reduce the time taken to pre-digest the protein.

The graph shows the time taken for the enzymes to completely pre-digest the protein. The manufacturer uses the same concentration of enzyme and the same mass of protein in each experiment.



(i) How long did it take enzyme V to pre-digest the protein? minutes

(1)

(ii) Which enzyme would you advise the baby food manufacturer to use? Draw a ring around your answer.

enzyme V enzyme W enzyme X enzyme Y enzyme Z

Give a reason for your answer.

.....
.....

(2)

(iii) Give two factors which should be controlled in the baby food manufacturer's investigations.

Tick (✓) two boxes.

Oxygen concentration

Temperature

Light intensity

pH

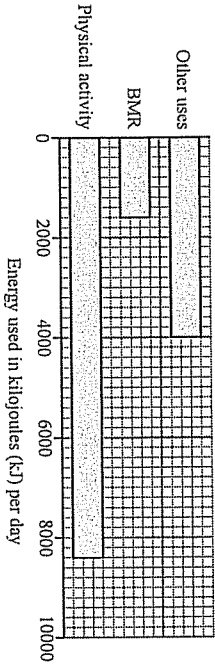
(Total 8 marks)

Diet and exercise

1. This question is about food and energy.
(a) Which person is likely to need the least amount of food?

Person	Amount of exercise	Temperature of country where person lives
1	high	warm
2	high	cold
3	low	warm
4	low	cold

The bar chart shows the amount of energy used by a teenager. BMR is the amount of energy needed to keep the teenager alive.



- (b) What is the total amount of energy used by the teenager in one day?
- 1600 kJ
 - 4000 kJ
 - 8400 kJ
 - 14 000 kJ
- (c) What is likely to happen if the same teenager takes in 17 000 kJ each day?
- The teenager would ...
- 1 gain mass.
 - 2 gain height.
 - 3 become fitter.
 - 4 be hungry all the time.

2. In each part choose only one answer.
The table is from the label on a loaf of sliced bread.

Nutrition Information		Guideline daily amounts			
Typical values	Per 100 g	Per slice	Women	Men	Children (5–10 years)
energy (kJ)	2144	658	8500	10 500	7500
protein (g)	4.0	1.2	75	95	65
carbohydrate (g)	55.1	16.9	230	300	220
fat (g)	22.6	7.0	70	70	50
salt (g)	0.9	0.3	5	6	4

Other Information
Keep an eye on your salt intake
Generally a low fat diet is good for you
If possible take 30 minutes of brisk exercise each day

- A For which food type is the guideline daily amount the same for men and women?
- 1 carbohydrate
 - 2 fat
 - 3 protein
 - 4 salt
- B A woman ate two slices of bread for breakfast.
What proportion of the daily guideline amount of fat did she eat?
- 1 $\frac{1}{14}$
 - 2 $\frac{1}{10}$
 - 3 $\frac{1}{7}$
 - 4 $\frac{1}{5}$

C Table 1 shows the amount of energy used for different levels of exercise.

Table 1

Level of exercise	Energy used in kilojoules per hour
light exercise	620
moderate exercise	1200
vigorous exercise	2760

Table 2 shows a person's weekly exercise routine.

Table 2

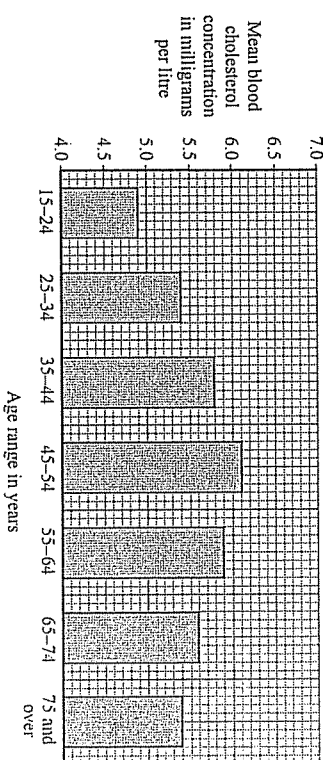
Day of week	Type of exercise in minutes		
	Light	Moderate	Vigorous
Monday	20	20	20
Tuesday	30	30	20
Wednesday	30	30	20
Thursday	30	30	20
Friday	30	30	20
Saturday	30	30	20
Sunday	30	20	20

What is the total amount of energy used by this person on Tuesday and Wednesday together?

- 1 3460 kilojoules
 - 2 3660 kilojoules
 - 3 3750 kilojoules
 - 4 4580 kilojoules
- D The link between exercise and nutrients in food is . . .
- 1 the less exercise you take, the less energy you need.
 - 2 the less exercise you take, the more carbohydrate you need.
 - 3 the less exercise you take, the more protein you need.
 - 4 the more exercise you take, the less salt you need.

3. In each part choose only one answer.

A survey was carried out to measure the blood cholesterol concentrations in the blood of women of different ages. The women had been instructed not to eat for 12 hours before having their blood sample taken. The results are shown in the bar chart.

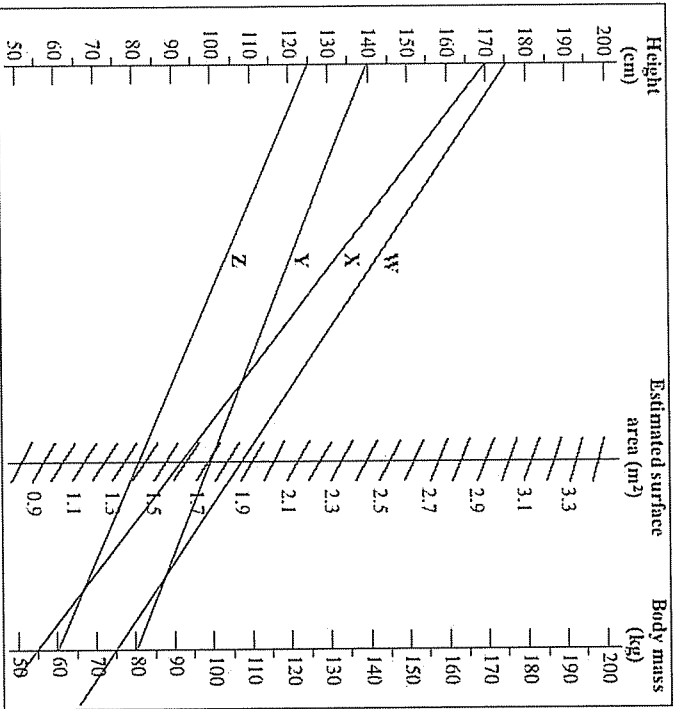


- A The concentration of cholesterol in the blood is . . .
- 1 a categoric variable.
 - 2 a continuous variable.
 - 3 a discrete variable.
 - 4 an ordered variable.
- B What is the difference in the mean concentration of cholesterol in the blood between a woman in the age range 25-34 and a woman in the age range 55-64?
- 1 0.4 milligrams per litre
 - 2 0.5 milligrams per litre
 - 3 0.6 milligrams per litre
 - 4 5.0 milligrams per litre
- C The women were instructed not to eat for 12 hours before the blood sample was taken. What is the reason for this?
- 1 It is risky taking blood samples when blood cholesterol concentrations are high.
 - 2 Blood samples can only be taken when all the cholesterol in food has been absorbed into the blood.
 - 3 All the cholesterol in the body will be excreted.
 - 4 To reduce any effects on the blood samples of food eaten recently.
- D Which one of the following would have been the best way to choose the women taking part in the trial?
- 1 ask randomly selected women whether they would like to take part in the trial
 - 2 record the data collected when women ask to have their cholesterol concentration measured
 - 3 send a questionnaire to every woman in a certain postal district
 - 4 secretly collect data from blood samples taken for other reasons

4. The surface area of an adult male can be estimated by using this nomogram.

A straight line is drawn from the man's height to his body mass. His surface area is then read off where the line crosses the surface area scale.

Data for four men, W, X, Y and Z, is plotted on the nomogram.



(a) The man with an estimated surface area of 1.71 m^2 is ...

- 1 W.
- 2 X.
- 3 Y.
- 4 Z.

(b) Why would this nomogram not give accurate results for a woman?

- 1 Women are generally shorter than men.
- 2 Women generally weigh less than men.
- 3 Women exercise more than men.
- 4 Women are generally a different shape from men.

(c) The actual surface area of a man depends mainly on ...

- 1 his body mass.
- 2 his height.
- 3 his body mass and his height.
- 4 factors other than his body mass and height.

(d) Man Z goes on a slimming programme.

Which of the following is likely to be affected by the programme?

- 1 his mass only
- 2 his height and his mass
- 3 his mass and his surface area
- 4 his height and his surface area