

Nutrients & Diet

Question Paper

Level	O Level
Subject	Biology
Exam Board	Cambridge International Examinations
Topic	Animal Nutrition
Sub Topic	Nutrients & Diet
Booklet	Question Paper 1

Time Allowed: 60 minutes

Score: /50

Percentage: /100

1 Which two foods would provide the best sources of carbohydrates, calcium, fibre (roughage) and vitamin C?

- A fish and eggs
- B green beans and cereal
- C meat and milk
- D yoghurt and cheese

2 Some factors associated with coronary heart disease are listed.

- 1 high blood pressure
- 2 high intake of fruit and vegetables
- 3 high intake of saturated fats
- 4 low blood cholesterol
- 5 low intake of processed foods

Which factors **decrease** the risk of coronary heart disease?

- A 1, 2 and 3 B 1, 3 and 5 C 2, 3 and 4 D 2, 4 and 5

3 The element nitrogen is needed to form

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

4 Which row correctly shows an advantage of feeding babies breast milk and an advantage of feeding them bottle milk?

	advantage of breast feeding	advantage of bottle feeding
A	Feeding helps create a bond between mother and baby.	Bottle feeding is cheaper.
B	It is easier to control the amount of milk the baby receives.	Other people besides the mother can feed the baby.
C	The baby receives antibodies from the mother.	The baby is less likely to suffer from diarrhoea.
D	The milk contains exactly the right balance of nutrients.	HIV is less likely to be transmitted from mother to baby.

5 What are the basic units from which glycogen is synthesised?

- A** amino acids
- B** fatty acids
- C** glucose
- D** glycerol

6 A food is known to contain protein, but no reducing sugar.

When this food is tested with biuret solution and Benedict's solution which colours would a student observe?

	biuret test	Benedict's test
A	blue	blue
B	blue	brick red
C	lilac/violet	blue
D	lilac/violet	brick red

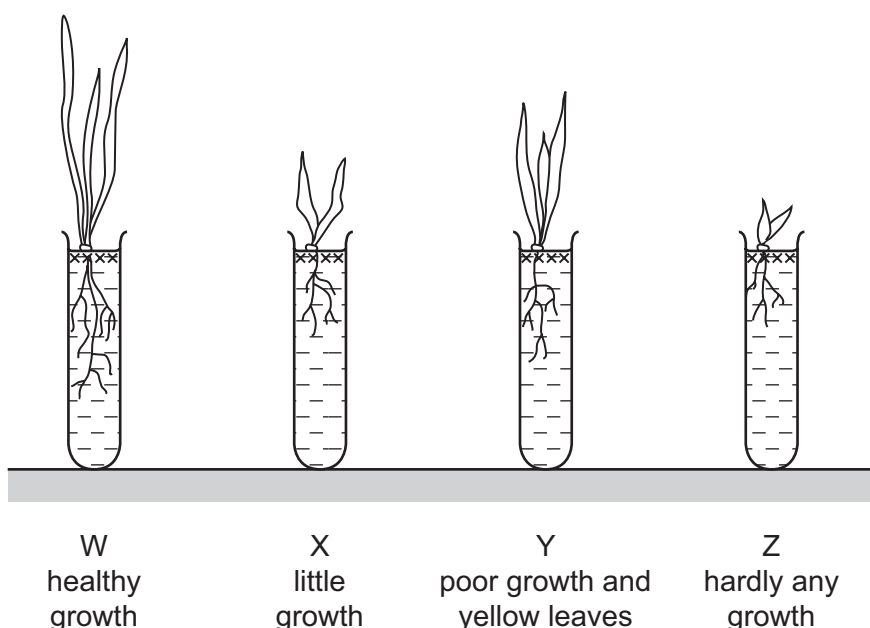
7 A student grows seedlings in four different test-tubes.

Tube W contains all the mineral ions needed for healthy plant growth.

The other three tubes contain

- water
- all minerals except magnesium ions
- all minerals except nitrates.

The diagram shows the appearance of these seedlings after two weeks.

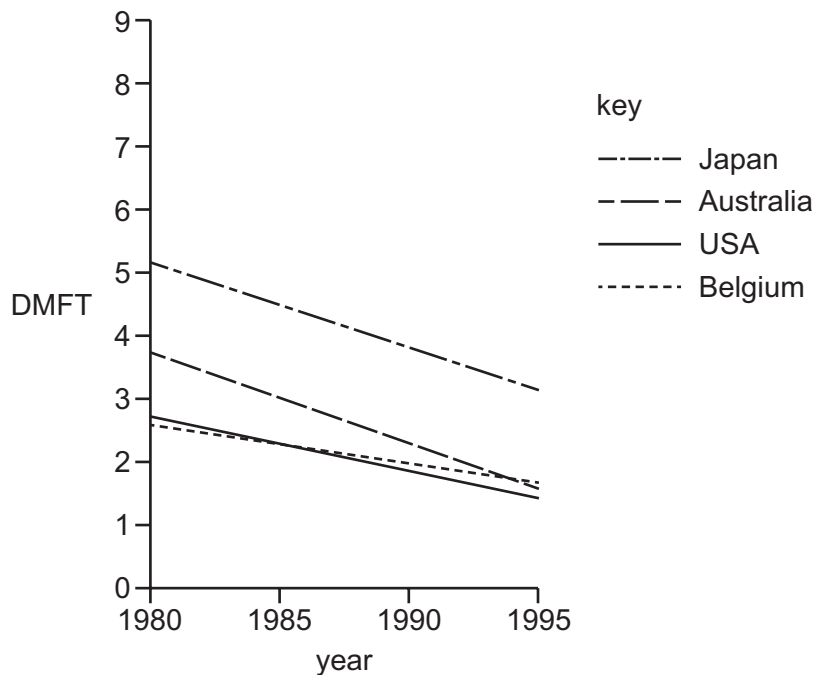


What do tubes X, Y and Z contain?

	X	Y	Z
A	all minerals except magnesium ions	all minerals except nitrates	water
B	all minerals except magnesium ions	water	all minerals except nitrates
C	all minerals except nitrates	all minerals except magnesium ions	water
D	water	all minerals except magnesium ions	all minerals except nitrates

- 8 The health of a population’s teeth can be measured by finding the average number of decayed, missing or filled teeth per person. This is called the DMFT.

The graph shows the DMFT for four countries in the years between 1980 and 1995. Australia and the USA have fluoride added to their water but Japan and Belgium do not.



The following statements were made.

- 1 The health of teeth has improved in all four countries.
- 2 Japan showed the greatest improvement.
- 3 Adding fluoride to the water causes the health of teeth to improve.

Which statements are supported by the graph?

- A** 1 and 2 **B** 1 only **C** 2 and 3 **D** 3 only

9 Which is a large molecule built up from amino acids?

- A amylase
- B glucose
- C glycogen
- D urea

10 Which symptom of malnutrition can be treated by an increased amount of protein in the diet?

- A constipation
- B heart disease
- C obesity
- D stunted growth

11 The table describes some characteristics of four people.

Which person requires the highest energy intake in their diet?

	age	sex	level of activity	body weight /kg
A	5	mal	high	18
B	20	ma	low	85
C	40	fema	high	82
D	65	fema	low	75

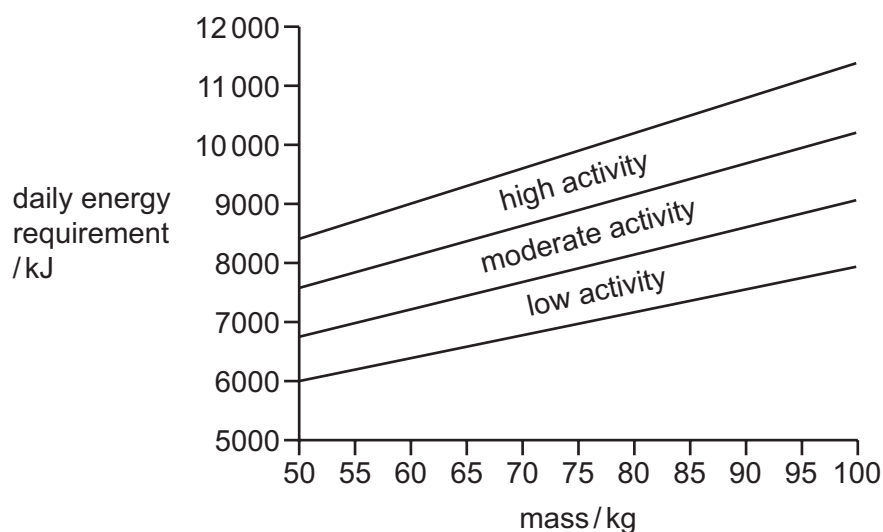
12 Which substances are present in breast milk but **not** in bottled milk made from milk powder?

- A antibodies
- B carbohydrates
- C proteins
- D vitamins

13 Which combination of mineral and vitamin is required for strong bones?

- A calcium and vitamin C
- B calcium and vitamin D
- C iron and vitamin C
- D iron and vitamin D

14 The graph can be used to estimate the daily energy requirements of women, depending on their mass and level of activity.



What is the estimated daily energy requirement of a woman of mass 75 kg who has a moderate level of activity?

- A 5000-6750 kJ
- B 7000-7750 kJ
- C 7750-8750 kJ
- D 9250-10 000 kJ

15 Which table states the tests for different food groups?

A

test	reagent	positive result
starch	iodine	blue-black
reducing sugars	Benedict's	orange
protein	biuret	purple
fats	ethanol	milky white

B

test	reagent	positive result
starch	biuret	blue-black
reducing sugars	Benedict's	orange
protein	iodine	purple
fats	ethanol	milky white

C

test	reagent	positive result
starch	iodine	blue-black
reducing sugars	Benedict's	purple
protein	biuret	milky white
fats	ethanol	orange

D

test	reagent	positive result
starch	biuret	blue-black
reducing sugars	Benedict's	purple
protein	iodine	milky white
fats	ethanol	orange

16 What are the basic units from which molecules of glycogen and of protein are synthesised?

	basic units of glycogen	basic units of protein
A	glucose	amino acids
B	glucose	fatty acids
C	glycerol	amino acids
D	glycerol	fatty acids

17 Which classes of foods contain the elements shown?

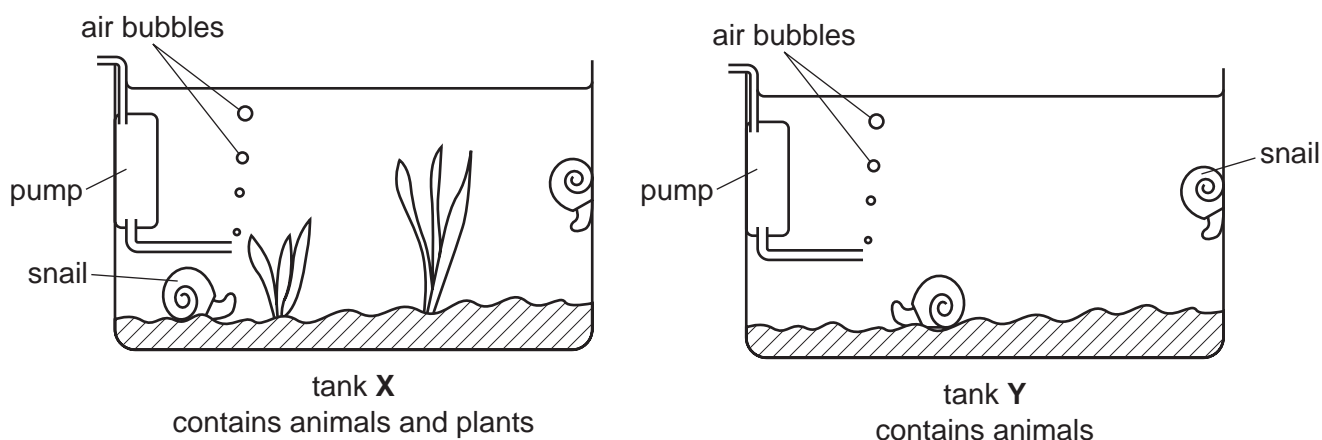
	carbohydrates	fats	proteins
A	C,H,O	C,H,O	C,H,O and N
B	C,H,O	C,H,O and N	C,H,O
C	C,H,O	C,H,O and N	C,H,O and N
D	C,H,O and N	C,H,O	C,H,O

18 A positive food test produces an orange precipitate.

Which test was performed?

- A** Amino acids were mixed with cold biuret solution.
- B** Glucose was heated with Benedict's solution.
- C** Protein was heated with Benedict's solution.
- D** Protein was mixed with biuret solution and heated.

19 Two aquarium tanks are set up as shown.



After a week, all the animals in tank Y show signs of distress.

This is because the animals have run out of

- A carbon dioxide.
- B food.
- C nitrate.
- D oxygen.

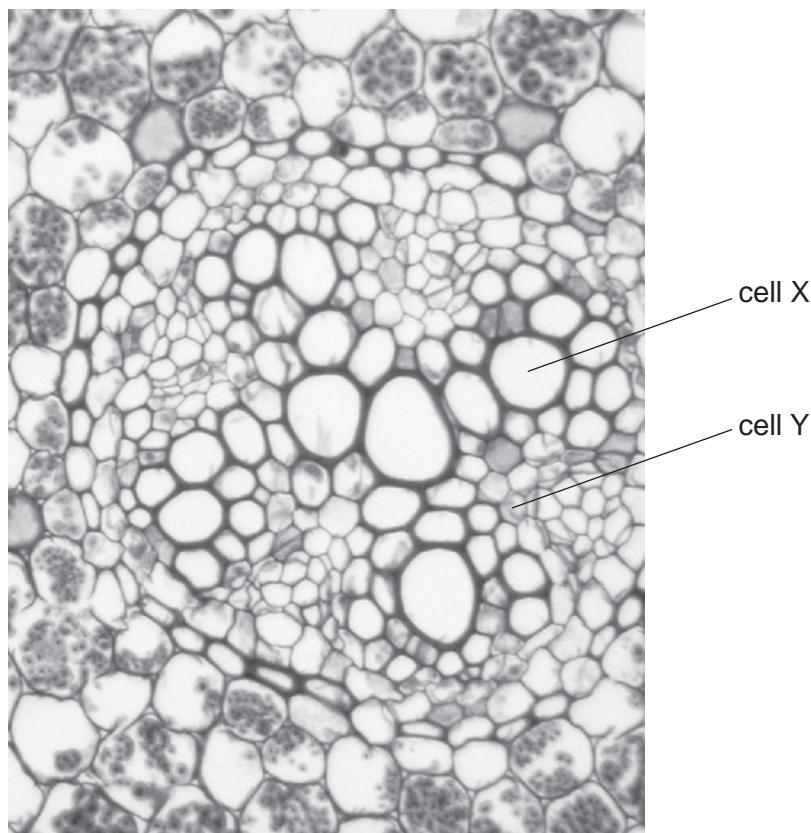
20 Which chemical elements are present in **both** fats and proteins?

- A carbon, hydrogen, oxygen and nitrogen
- B carbon, hydrogen and oxygen only
- C carbon, hydrogen and nitrogen only
- D carbon, oxygen and nitrogen only

21 Which two foods would provide the best sources of carbohydrates, calcium, fibre (roughage) and vitamin C?

- A fish and eggs
- B green beans and cereal
- C meat and milk
- D yoghurt and cheese

22 The photomicrograph shows part of a section through a stem.



The contents of cell X and the contents of cell Y are each tested with Benedict’s reagent and with iodine solution.

What results are expected?

	cell X		cell Y	
	Benedict’s reagent	iodine solution	Benedict’s reagent	iodine solution
A	+	+	–	–
B	+	–	+	+
C	–	+	–	+
D	–	–	+	–

key
 + = positive result
 – = negative result

23 Pregnant women are advised to eat a diet with enough protein, calcium and iron for the developing baby.

Which needs are supplied by these constituents of food for the baby’s bones, growing tissues and red blood cells?

	bones	growing tissues	red blood cells
A	calcium	protein	iron
B	carbohydrate	calcium	protein
C	iron	carbohydrate	calcium
D	protein	iron	carbohydrate

24 A person tries eating a diet consisting only of lettuce leaves and water.

Which condition might develop?

- A constipation
- B heart disease
- C rickets
- D scurvy

25 The table shows the compositions of four foods.

Which food provides the most energy per gram?

	carbohydrate %	fat %	protein %	water %
A	1	16	28	55
B	2	83	2	13
C	5	4	3	88
D	25	20	23	35

26 Which row correctly gives a good source of vitamin C and its deficiency symptom?

	good source	deficiency symptom
A	egg yolk	softening of bones
B	egg yolk	bleeding gums
C	fresh green vegetables	softening of bones
D	fresh green vegetables	bleeding gums

27 A protein solution is tested using three different reagents.

Which set of results is obtained?

	iodine solution	Benedict's solution	biuret solution
A	black	blue	blue
B	black	red	blue
C	brown	blue	purple
D	brown	red	purple

28 Magnesium is an essential element for

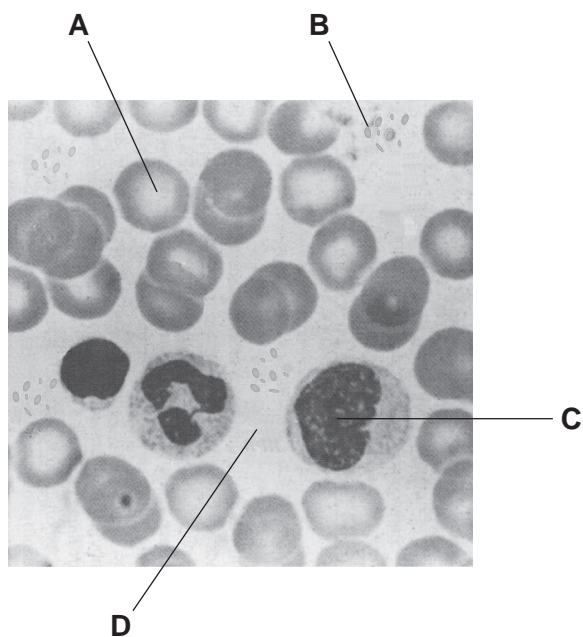
- A** the formation of cell walls.
- B** the formation of chlorophyll.
- C** the formation of proteins.
- D** the process of cell division.

29 Which chemical elements are found in carbohydrates, fats and proteins?

	carbohydrates	fats	proteins
A	carbon, hydrogen and oxygen	carbon, hydrogen and oxygen	carbon, hydrogen, oxygen and nitrogen
B	carbon, hydrogen and oxygen	carbon, hydrogen, oxygen and nitrogen	carbon, hydrogen and oxygen
C	carbon, hydrogen, oxygen and nitrogen	carbon, hydrogen and oxygen	carbon, hydrogen and oxygen
D	carbon, hydrogen, oxygen and nitrogen	carbon, hydrogen and oxygen	carbon, hydrogen, oxygen and nitrogen

30 The photomicrograph shows human blood.

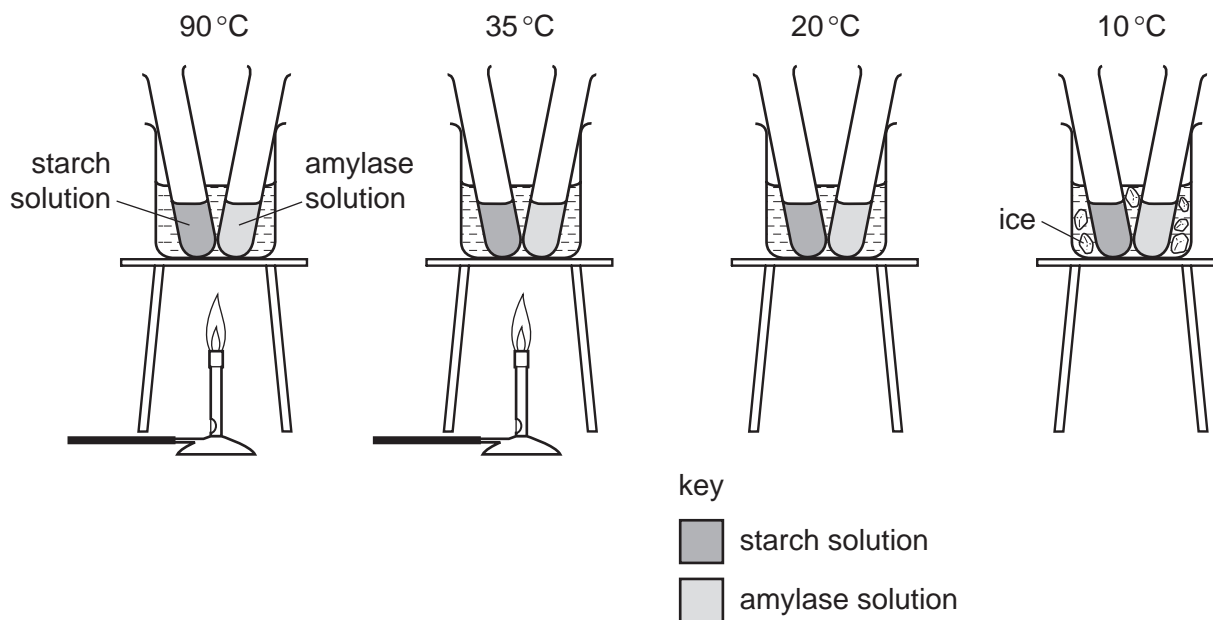
Which component cannot function effectively if a person's diet lacks iron?



magnification $\times 1000$

31 The diagram shows an experiment on amylase.

Each beaker contains water at the temperature shown.



After five minutes, each test-tube of amylase is poured into the test-tube of starch solution in the same beaker.

After leaving the tubes for 5 minutes, samples of the mixture are then tested with iodine solution and then tested again at 5 minute intervals.

Which results are expected?

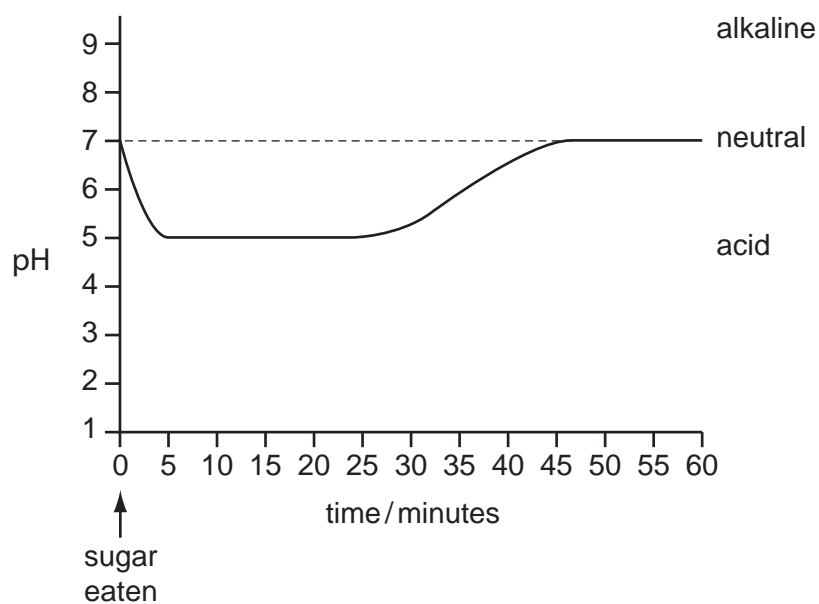
	90 °C	3 °C	2 °C	1 °C
A	blue-black after 30 minutes	goes yellow-brown immediately	goes yellow-brown after 5 minutes	blue-black after 30 minutes
B	blue-black after 30 minutes	goes yellow-brown after 5 minutes	goes yellow-brown immediately	blue-black after 30 minutes
C	goes yellow-brown immediately	goes yellow-brown after 5 minutes	goes yellow-brown after 5 minutes	blue-black after 30 minutes
D	goes yellow-brown after 5 minutes	blue-black after 30 minutes	blue-black after 30 minutes	goes yellow-brown after 5 minutes

32 The table shows the recommended daily intake of energy and of iron for females at four different ages: 6 months, 5 years, 25 years and 75 years.

Which shows the recommended daily intake for the 25 year old?

	energy / MJ	iron / mg
A	2.7	4.3
B	6.5	6.1
C	7.6	8.7
D	8.1	14.8

33 The graph shows the pH of the saliva in the mouth after eating sugar.



When are conditions in the mouth most likely to cause tooth decay?

- A** 0-5 minutes
- B** 5-25 minutes
- C** 25-45 minutes
- D** 45-60 minutes

34 Which chemical test shows the presence of an enzyme in a biological washing powder?

- A Benedict's
- B biuret
- C ethanol emulsion
- D iodine solution

35 The symptoms of a disease include weakness, fatigue, aching and swollen joints, bruise-like spots round the hair follicles and swollen and soft gums.

Which food is used to treat this disease?

- A liver as a source of iron
- B milk as a source of calcium
- C oily fish as a source of vitamin D
- D oranges as a source of vitamin C

36 Vitamin C changes cholesterol into a form which is less likely to be deposited in artery walls.

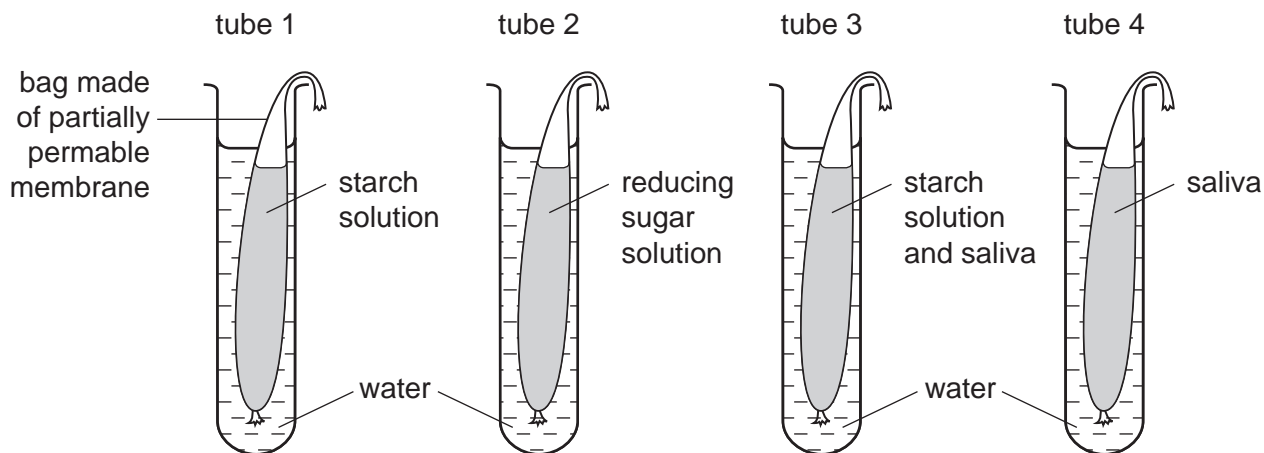
Which dietary advice would help prevent coronary heart disease?

- A Eat more bread and less meat.
- B Eat more butter and less bread.
- C Eat more meat and less oranges.
- D Eat more oranges and less butter.

37 Which row in the table correctly identifies the deficiency diseases caused by lack of vitamin C, calcium and iron?

	lack of vitamin C	lack of calcium	lack of iron
A	anaemia	rickets	scurvy
B	brittle bones	anaemia	rickets
C	rickets	scurvy	brittle bones
D	scurvy	brittle bones	anaemia

38 Four bags made of partially permeable membrane are placed in tubes of water as shown in the diagram.



After 20 minutes at 35 °C a sample of the water around the bag in each tube is boiled with Benedict's solution.

What are the expected results?

	tube 1	tube 2	tube 3	tube 4
A	blue	orange	blue	orange
B	blue	orange	orange	blue
C	orange	blue	orange	blue
D	orange	orange	blue	orange

39 Four foods were analysed for protein, fat and carbohydrate.

Which food contains the most energy in a 100g portion?

	protein %	fat %	carbohydrate %
A	20	7	1
B	10	9	20
C	4	5	6
D	0.5	0.5	5

40 For which food test must the sample be dissolved in ethanol?

- A fat
- B protein
- C reducing sugar
- D starch

41 Four tubes containing 10 cm³ of 1 % starch solution were treated in different ways and then mixed with saliva. After 30 minutes, 1 cm³ of iodine in potassium iodide solution was added to each tube.

In which tubes were the contents a yellow-brown colour?

	tube incubated at 35 °C	tube incubated at 75 °C	tube incubated at pH 2.5	tube incubated at pH 6.9
A	✓		✓	
B	✓			✓
C		✓		✓
D		✓	✓	

key

✓ = yellow-brown colour

42 It has been shown that animals restricted to a diet of milk only, eventually suffer from blood disorders involving a lack of pigment in their red blood cells.

Which is the most likely explanation of this?

- A Milk is deficient in iron.
- B Milk contains more calcium than is required by most animals.
- C Milk is deficient in vitamin A.
- D Milk contains no roughage.

43 The table shows the nutrients in different parts of a meal.

Which food would be most useful in preventing constipation?

	food	energy kJ	protein g	fat g	carbohydrate g	fibre g
A	apple juice	163	0.1	0	9.4	0
B	ripe banana	466	1.5	0.4	27	4.9
C	salad sandwich	1054	19	7.3	27	6.1
D	toffee bar	458	2.1	3.3	19	1.1

44 Tennis players often eat bananas during long matches.

Which nutrient in a banana is important during the match?

- A carbohydrate
- B fibre
- C iron
- D vitamin C

45 Which substances are needed in the diet to prevent rickets?

- A calcium and vitamin C
- B calcium and vitamin D
- C iron and vitamin C
- D iron and vitamin D

46 A lack of which nutrient causes gums to bleed?

- A calcium
- B iron
- C vitamin C
- D vitamin D

47 The table shows some of the nutrients present in four foods.

food	iron / mg per 100g of food	calcium / mg per 100g of food	vitamin C / mg per 100g of food	vitamin D / μ g per 100g of food
1 bananas	0.4	7	10	0
2 fish	0.4	35	0	6.38
3 lentils	7.6	30	0	0
4 milk	0.1	120	0.5	0.002

Which two foods are best to help the healthy growth of bones and teeth of a child?

- A** 1 and 2 **B** 1 and 3 **C** 2 and 3 **D** 2 and 4

48 Four different foods were tested as shown below and the test results were recorded as positive (+) or negative (-).

Which food contained both glucose and oil?

food	Benedict's test	biuret test	ethanol emulsion test	iodine test
A	+	+	-	-
B	+	-	+	-
C	-	+	-	+
D	-	-	+	+

49 Which symptom is caused by a deficiency of vitamin D?

- A** anaemia
B bones breaking easily
C constipation
D gums bleeding

50 Two samples of food are tested. The results are shown in the table.

	test used		
	iodine solution	Benedict's test	biuret test
sample 1	brown	orange	blue
sample 2	blue / black	blue	violet

What do these results show?

- A Sample 1 contains starch and sugars.
- B Sample 1 contains starch only.
- C Sample 2 contains starch and protein.
- D Sample 2 contains protein only.