

Specimen Module Tests and Mark Schemes

Edexcel GCSE

Science: Single Award B (1535)

Science: Double Award B (1536)

Biology B (1529)

Chemistry B (1539)

Physics B (1549)

For First Examination

Summer 2003

Edexcel is one of the leading examining and awarding bodies in the UK and throughout the world. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Through a network of UK and overseas offices, Edexcel's centres receive the support they need to help them deliver their education and training programmes to learners.

For further information please call our Customer Response Centre on 0870 240 9800, or visit our website at www.edexcel.org.uk

Autumn 2000

Publications Code UG 009366

All the material in this publication is copyright

© Autumn 2000 Edexcel

Edexcel Foundation is a registered charity and a company limited by guarantee.

Registered in England No. 1686164

Contents

Specimen Module Test Paper 1.....	p 2
Specimen Module Test Paper 2.....	p 8
Specimen Module Test Paper 3.....	p 14
Specimen Module Test Paper 4.....	p 22
Specimen Module Test Paper 5.....	p 28
Specimen Module Test Paper 6.....	p 34
Specimen Module Test Paper 7.....	p 40
Specimen Module Test Paper 8.....	p 48
Specimen Module Test Paper 9.....	p 54
Specimen Module Test Paper 10.....	p 60
Specimen Module Test Paper 11.....	p 66
Specimen Module Test Paper 12.....	p 73
Specimen Module Test Paper 13.....	p 81
Specimen Module Test Paper 14.....	p 87
Specimen Module Test Paper 15.....	p 94
Specimen Module Test Paper 16.....	p 100
Specimen Module Test Paper 17.....	p 105
Specimen Module Test Paper 18.....	p 112
Specification Grids Module Test Papers 1 - 18.....	p 119

Subject Title

Science

Test No.

XXX

Time Allowed

20 minutes

Centre No.

Candidate No.

Surname

Edexcel

GCSE

Science (Modular)

Module 1 (2003 Series)

Specimen paper

The human body – action and control

Use an **HB pencil**. Do not open this booklet until you are told to do so.

Before the test begins:

- 1 Check that your answer grid is headed 'Science Test XXX'.
- 2 Write your own centre number and candidate number on the **answer grid** in the boxes at the top right hand corner. Join the correct dots below the boxes to match the numbers you have written.

Example: Jim Doe is at centre 02120 and his candidate number is 1012. He will do this:

CENTRE NUMBER					CANDIDATE NUMBER			
0	2	1	2	0	1	0	1	2
0	0	0	0	0	0	0	0	0
↔	↔	↔	↔	↔	↔	↔	↔	↔
1	1	1	1	1	1	1	1	1
↔	↔	↔	↔	↔	↔	↔	↔	↔
2	2	2	2	2	2	2	2	2
↔	↔	↔	↔	↔	↔	↔	↔	↔

How to answer the test:

- 3 For each question, choose the right answer, A, B, C or D and mark it on the answer grid - join the dots below the right letter.

For example, the answer C would be marked as shown.

A	B	C	D
↔	↔	↔	↔

- 4 Mark only **one** answer for each question. If you change your mind about an answer, rub out the first mark **carefully**, then mark your new answer.
- 5 Answer **all** the questions.
- 6 Do any necessary calculations and rough work in this booklet. You may use a calculator if you wish.
You must not take this booklet or the answer grid out of the examination room.

Turn over

Answer all the questions, using the Answer grid.

1. The digestive system
 - A absorbs sugar into the blood
 - B controls body temperature
 - C fights infection
 - D gets rid of sweat

2. The kidneys produce
 - A sweat
 - B blood
 - C digestive juices
 - D urine

3. Sweating cools the body when the sweat
 - A boils
 - B condenses
 - C evaporates
 - D freezes

4. Which of these is part of the blood?
 - A saliva
 - B plasma
 - C faeces
 - D retina

5. Urine contains a poisonous waste. The body must get rid of it. This waste is
 - A acid
 - B water
 - C sugar
 - D urea

6. Which of these is a pain killer?
 - A barbiturate
 - B caffeine
 - C paracetamol
 - D tobacco

7 Nerve impulses are carried by

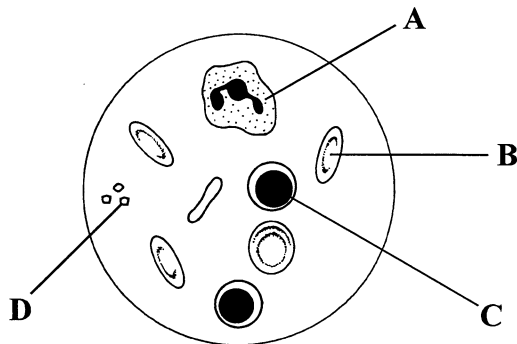
- A plasma
- B neurones
- C nephrons
- D hairs

8. Some young men are playing a video game.
What happens to the speed of their reactions after two alcoholic drinks?

- A Their reactions slow down
- B Their reactions are much faster
- C Their reactions are slightly faster
- D There is no change in the speed of their reactions

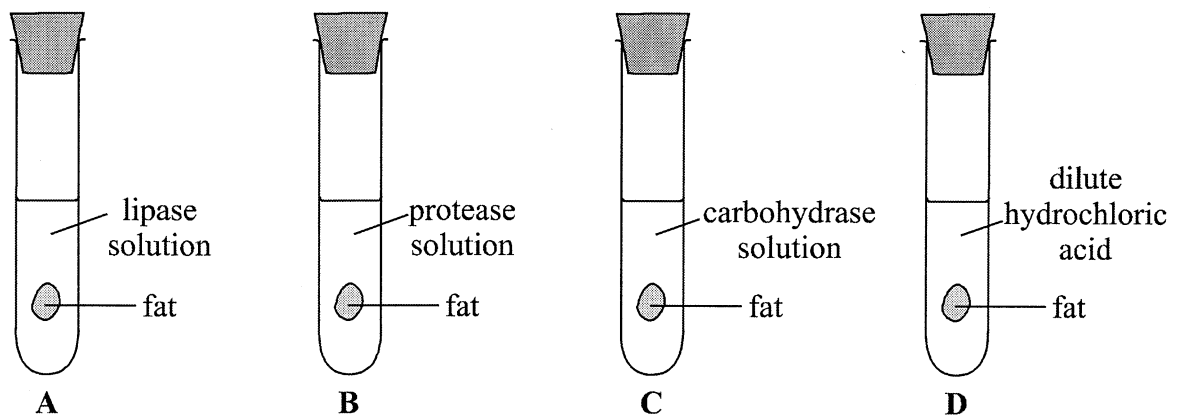
STANDARD DEMAND

9. The diagram shows parts of the blood.



Which part of the blood takes in bacteria?

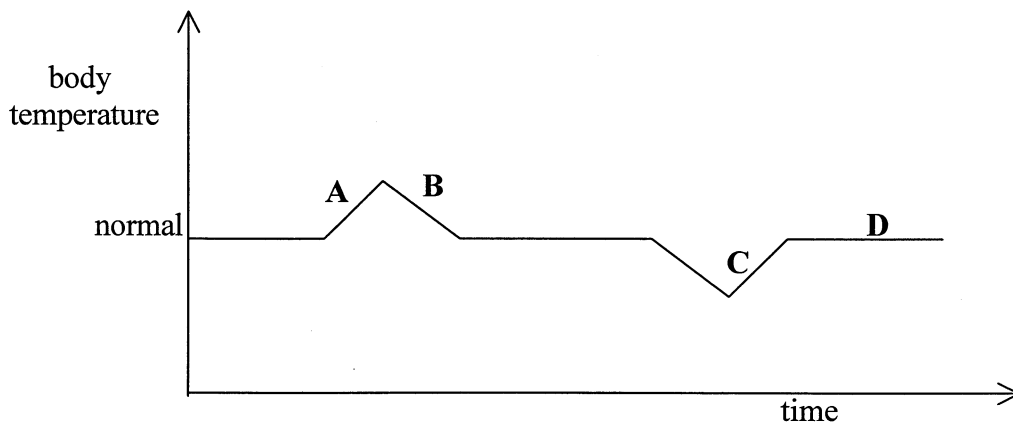
10. The diagrams show apparatus used to investigate enzyme action.



The tubes were kept at 37 °C. Which tube contained the least fat after 2 hours?

11. The haemoglobin in a red blood cell helps it to
- A clot blood
 - B digest food
 - C carry oxygen
 - D fight infection
12. Which part of the eye changes the amount of light entering the eye?
- A retina
 - B optic nerve
 - C lens
 - D iris
13. Which organ stores bile?
- A gall bladder
 - B pancreas
 - C small intestine
 - D stomach
14. Which of these forms the network of a scab?
- A antibodies
 - B fibrin
 - C haemoglobin
 - D platelets
15. Which part of the digestive system contains villi?
- A the liver
 - B the pancreas
 - C the large intestine
 - D the small intestine

16. The graph shows temperature changes in a healthy person's body



At which time (A, B, C or D) would the person shiver?

HIGH DEMAND

17. The ciliary body changes the shape of the lens in the eye.
Which row of the table is correct when the eye is focused on a distant object?

	shape of the lens	ciliary body
A	very curved	contracted
B	slightly curved	contracted
C	slightly curved	relaxed
D	very curved	relaxed

18. The diagram shows the pathway of a nerve impulse.

receptor \longrightarrow X \longrightarrow central nervous system

X is

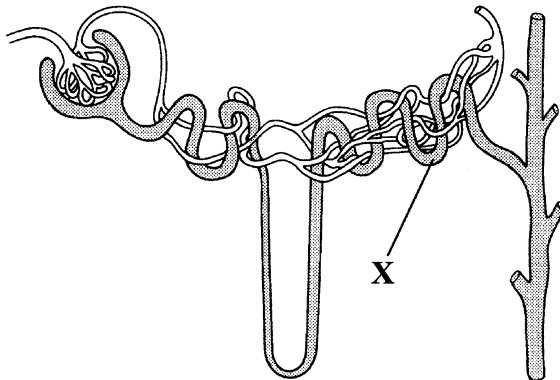
- A** a sensory neurone
 - B** an effector
 - C** a motor neurone
 - D** a stimulus
19. Which of these is **not** an example of homeostasis?

The control of

- A** blood sugar level
- B** water content of body
- C** height of body
- D** body temperature

20. The hormone ADH regulates the water content of the blood by controlling the
- A action of the sweat glands
 - B feeling of thirst
 - C rate of breathing
 - D reabsorption in the kidney

21. The diagram shows a nephron.



X is the

- A first coiled tube
 - B collecting duct
 - C second coiled tube
 - D Bowman's capsule
22. The table shows an analysis of samples of blood plasma, glomerular filtrate and urine.

	blood plasma %	glomerular filtrate %	urine %
glucose	0.1	0.1	0
protein	8	0	0
salt	0.35	0.35	0.42
urea	0.03	0.03	2

Which component is completely reabsorbed?

- A urea
- B protein
- C salt
- D glucose

23. Here are two statements about nerve impulses.

- 1 An electrical charge carries a nerve impulse across a synapse
- 2 Chemical transmitters carry a nerve impulse along a neurone

Which statements are correct?

- A** 1 only
- B** 2 only
- C** both 1 and 2
- D** neither

24. Here are two statements about bile.

- 1 Bile neutralises acid from the stomach
- 2 Bile contains lipase

Which statements are correct?

- A** 1 only
- B** 2 only
- C** both 1 and 2
- D** neither

END

Answer all the questions, using the Answer grid.

1. Which of these is an air pollutant?
A sulfur dioxide
B oxygen
C nitrogen
D water vapour

2. Which of these is likely to increase pollution?
A less use of aircraft
B planting more trees
C lower speed limit for cars
D bigger population

3. A unit of inherited information is a
A chromosome
B sperm cell
C gene
D nucleus

4. A male baby inherits his characteristics
A mainly from his mother
B about equally from both parents
C mainly from his father
D completely from his father

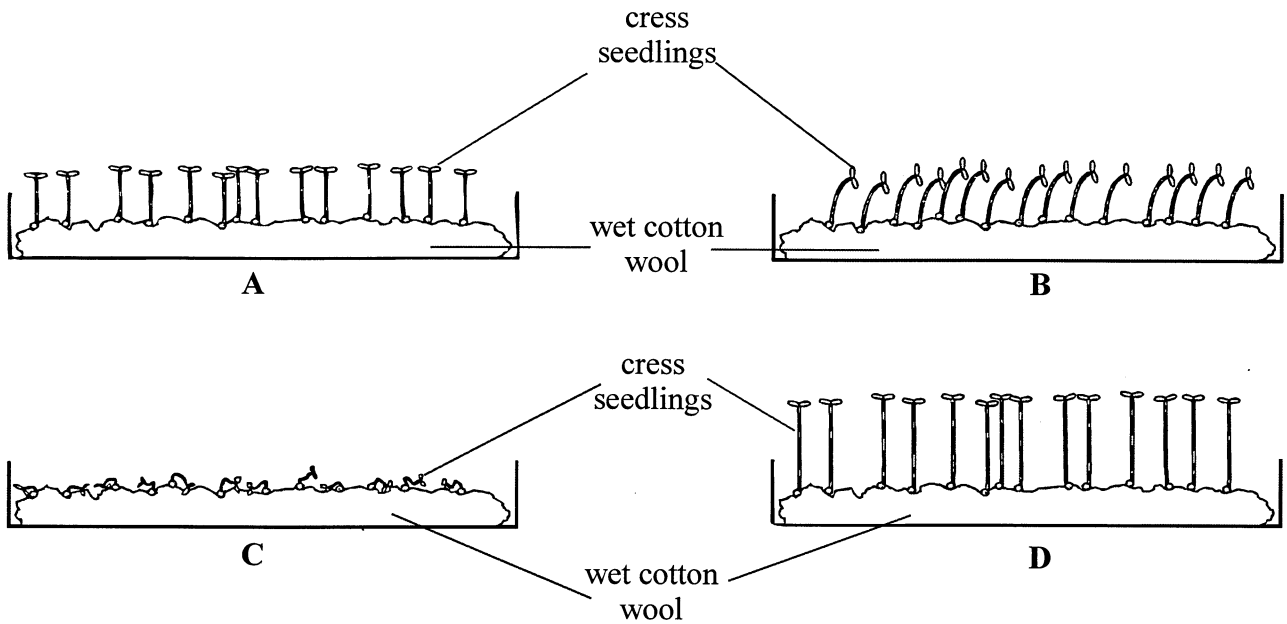
5. Liz has blue eyes and Sunil has brown eyes.
This is because
A one is a girl and one is a boy
B they ate different food when they were babies
C Liz's mother smoked when she was pregnant
D they have different genes for eye colour

6. In a cell, the genes are part of the
A cell membrane
B nucleus
C cell wall
D cytoplasm

7. The development of breasts in girls is caused by
- A a fatty diet
 - B testosterone
 - C oestrogen
 - D arm exercises
8. A farmer always breeds from cows which produce a lot of milk. This is an example of
- A artificial selection
 - B evolution
 - C variation
 - D mutation

STANDARD DEMAND

9. Which diagram shows cress seedlings that have been kept in air containing sulfur dioxide?



10. A mutation is
- A a change in a gene
 - B a change in appearance
 - C an allele
 - D a pollutant

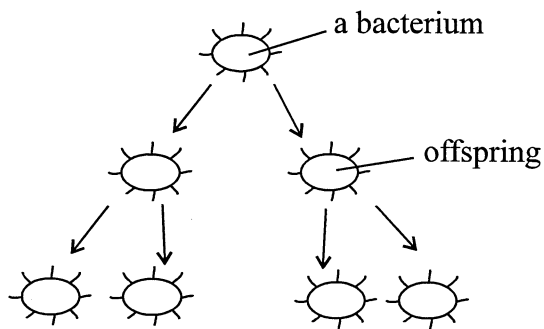
11. Which of these may cause mutations?

- A too much fat in the diet
- B exposure to sunlight
- C too little sleep
- D too much exercise

12. The number of chromosomes in the nucleus of a muscle cell is the

- A diploid number
- B haploid number
- C heterozygous number
- D homozygous number

13. The diagram shows bacteria multiplying.



Which of these is **not** a correct description of this multiplication?

- A reproduction
- B fertilisation
- C cloning
- D asexual

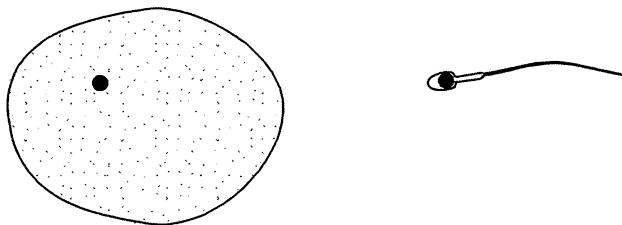
14. Differences in the height of adult humans are caused by

- A the environment but not genes
- B genes but not the environment
- C neither genes nor the environment
- D both genes and the environment

15. Lynx are predators of snowshoe hares.
Which of these changes will cause a rise in the population of snowshoe hares?

- A a disease affecting the lynx but not the hares
- B a rise in the lynx population
- C a reduction in the food supply of the snowshoe hare
- D a decrease in the predators of the lynx

16. The diagram shows a sperm cell about to fertilise an egg cell.



The fertilised egg cell grows into a girl.

Which row of the table shows the sex chromosomes in the egg and sperm cells?

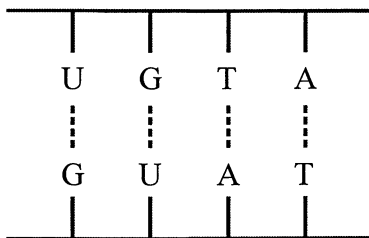
	sex chromosome from egg cell	sex chromosome from sperm cell
A	X	Y
B	X	X
C	Y	Y
D	Y	X

HIGHER DEMAND

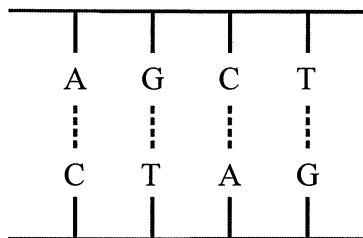
17. The alleles for fur colour in mice are black (**B**) and brown (**b**).
When a black mouse (**BB**) is crossed with a brown mouse (**bb**) all the offspring are black.
If the offspring from this cross are bred together, the expected ratio of fur colour will be

- A 4 black to 0 brown
- B 3 black to 1 brown
- C 2 black to 2 brown
- D 1 black to 3 brown

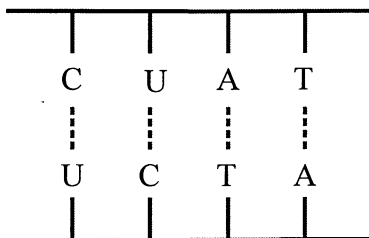
18. The diagrams show the base pairs for parts of a DNA molecule.



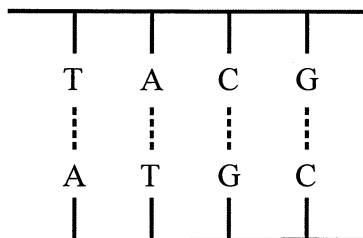
A



B



C



D

Which diagram shows the correct pairing of the bases in DNA?

19. Which of these causes a breakdown in the lining of the uterus?

- A** a rise in the level of progesterone
- B** a fall in the level of testosterone
- C** a rise in the level of oestrogen
- D** a fall in the level of progesterone

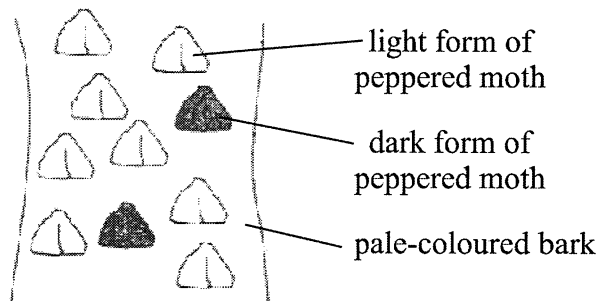
20. A recessive allele is one which

- A** is only present in a gamete
- B** is always shown in the phenotype
- C** can be present in homozygotes
- D** is never present in heterozygotes

21. A gene can be transferred from a donor to a recipient.
The gene is cut from the donor's chromosome using

- A** plasmids
- B** bacteria
- C** an enzyme
- D** a hormone

22. Which of these is true of cell division by meiosis?
- A The cells produced have the same number of chromosomes as the parent cell
 - B The cells produced are not identical to one another
 - C It takes place in all organs of the body
 - D The parent cell divides into two
23. Peppered moths are eaten by spiders and birds.
The diagram shows light and dark forms of the peppered moth resting on a tree trunk.



The list describes two possible environmental changes.

- 1 an increase in the number of moth-eating birds
- 2 an increase in the smoke emitted from nearby factories

Which of these would increase the **proportion** of dark moths in the population?

- A 1 only
 - B 2 only
 - C both 1 and 2
 - D neither
24. The list gives statements about clones produced from a red-flowered rose bush.
- 1 Their flowers will be in the ratio of 3 red to 1 white
 - 2 They will inherit resistance to the same diseases
 - 3 They will all grow to exactly the same height

Which statements are correct?

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

END

Answer all the questions, using the Answer grid.

1. Iron reacts with chlorine to form

- A iron carbonate
- B iron chromate
- C iron chloride
- D iron cuprate

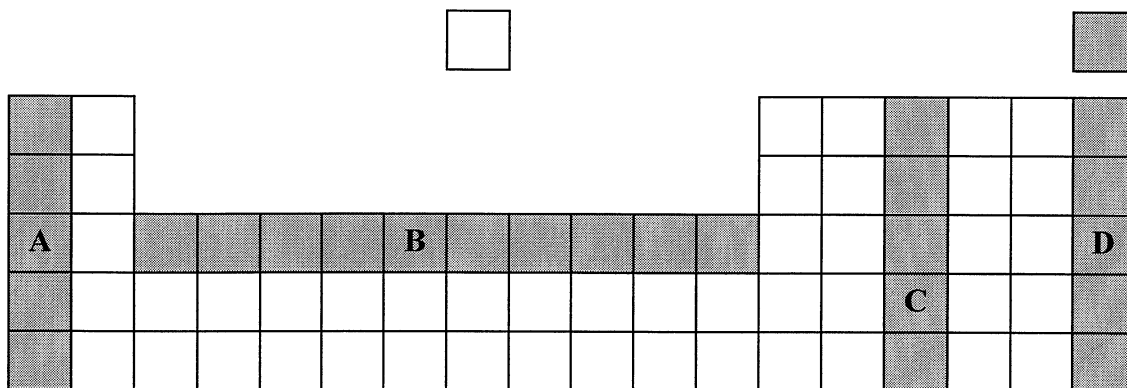
2. The centre of an atom is called the

- A nucleus
- B shell
- C electron
- D ion

3. Chlorine is added to drinking water to

- A soften the water
- B act as a bleach
- C reduce tooth decay
- D kill bacteria

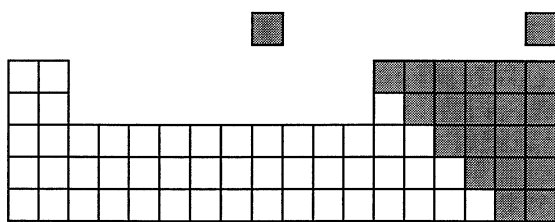
4. Which letter shows the position of group 1 in the periodic table?



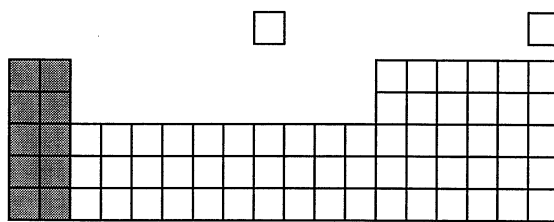
5. All substances are made of particles.
Reactions are **most** likely to occur when particles

- A slow down
- B collide
- C condense
- D expand

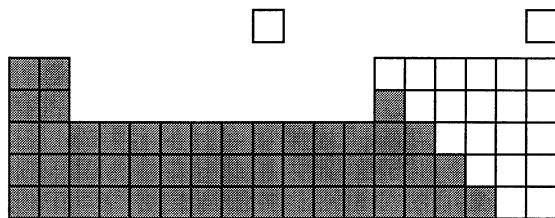
6. The diagrams below show periodic tables with different parts shaded. Which shading shows where the non-metals are found?



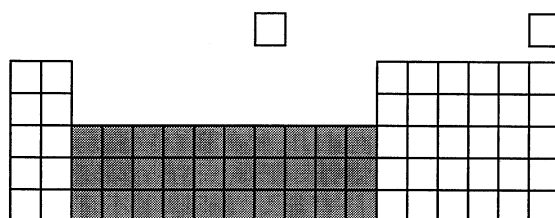
A



B

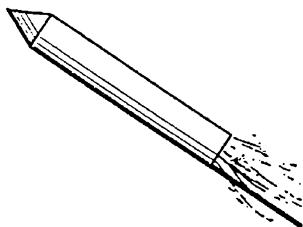


C



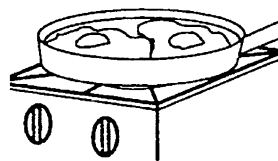
D

7. Which is the slowest chemical reaction?



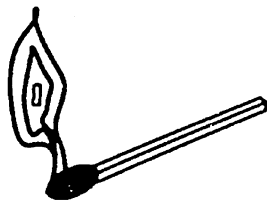
a firework exploding

A



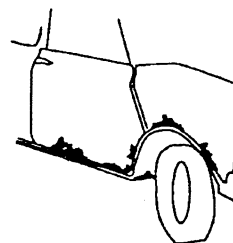
an egg frying

B



a match burning

C



a car rusting

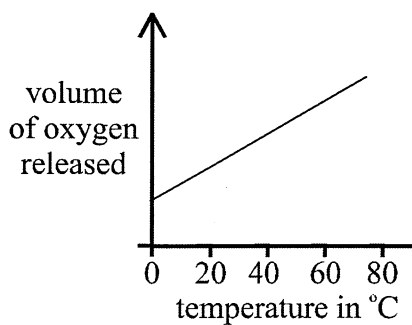
D

8. Elements in the periodic table are arranged in order of

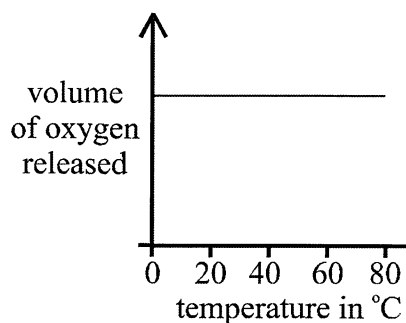
- A chemical reactivity
- B date of discovery
- C atomic number
- D percentage in the Earth's crust

STANDARD DEMAND

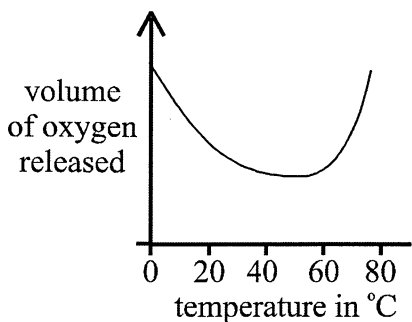
9. Potatoes contain an enzyme. This enzyme can be used to break down hydrogen peroxide. The reaction releases oxygen. Which graph shows how this reaction is affected by temperature?



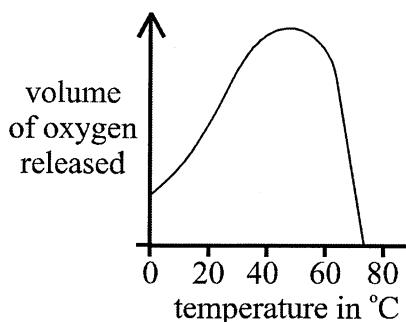
A



B



C



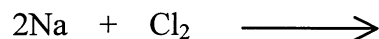
D

10. Fluorine, bromine and iodine are

- A halogens
- B transition metals
- C alkali metals
- D noble gases

11. The rate of a chemical reaction is speeded up by
- A using lumps of reactant instead of powder
 - B raising the temperature
 - C diluting the reactants
 - D removing a catalyst

12. Sodium reacts with chlorine to form sodium chloride.



Which of these correctly completes the equation?

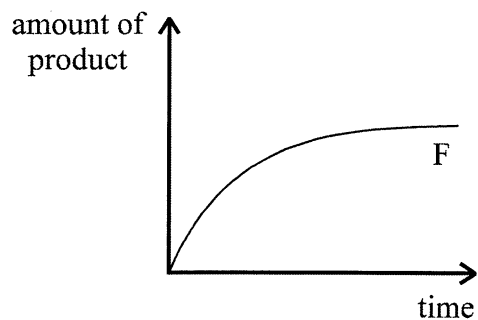
- A 2NaCl_2
 - B Na_2Cl_2
 - C 2NaCl
 - D $(\text{NaCl})_2$
13. Sodium chloride is a compound of sodium and chlorine.
The properties of sodium chloride are
- A the same as sodium
 - B the same as chlorine
 - C the same as both sodium and chlorine
 - D different from both sodium and chlorine
14. X and Y show the position of two elements in the periodic table.

1	2							3	4	5	6	7	0
													Y
X													

To which groups do X and Y belong?

- | | X | Y |
|---|---------------|---------------|
| A | alkali metals | halogens |
| B | halogens | alkali metals |
| C | alkali metals | noble gases |
| D | noble gases | halogens |

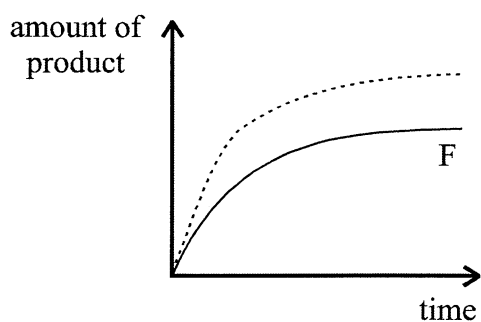
15. The line marked F on the graph shows the rate of a chemical reaction.



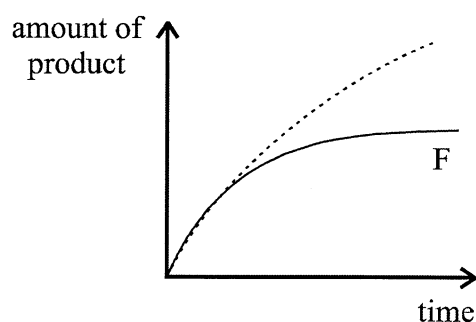
In a second experiment, a catalyst is added to the reaction.

All other conditions are kept the same.

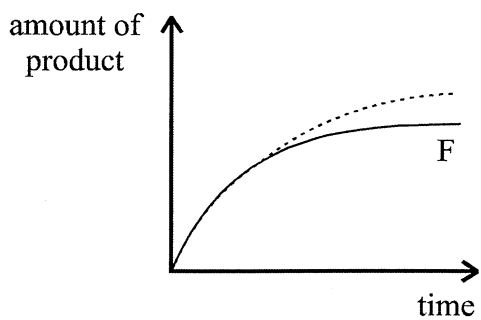
Which graph (A, B, C or D) shows the dotted line obtained using the catalyst?



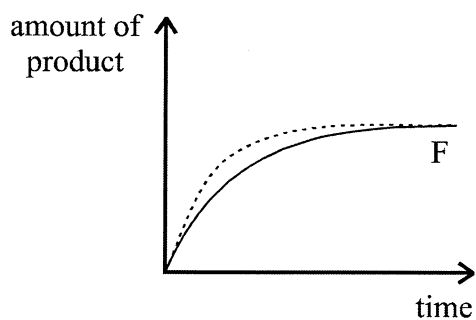
A



B



C

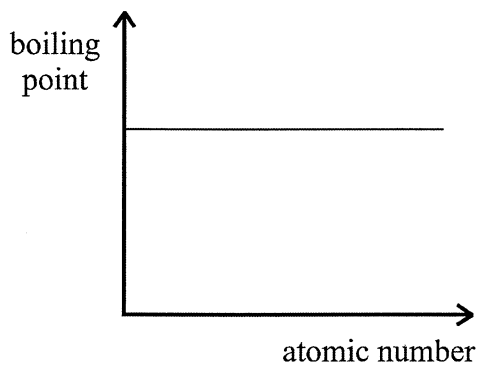


D

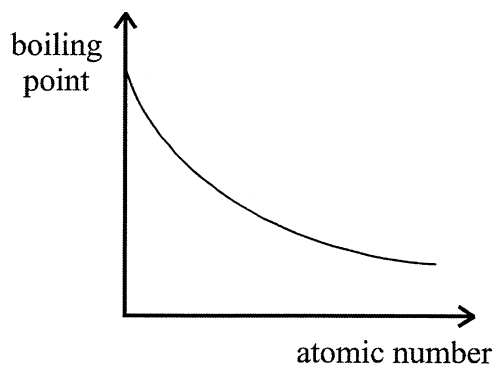
16. Two elements are placed in the same group of the periodic table. Both elements must

- A** be extracted from their ore using electrolysis
- B** have the same number of electrons in their outer shell
- C** have the same colour
- D** react with water to produce hydrogen

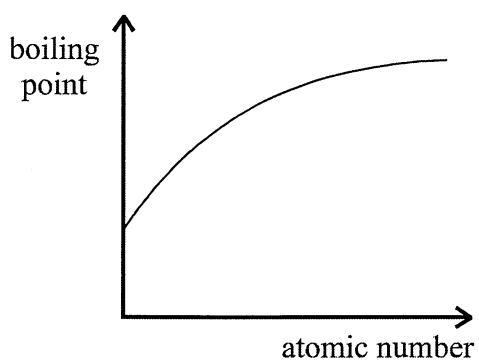
17. Which graph shows the trend in the boiling points of the halogens?



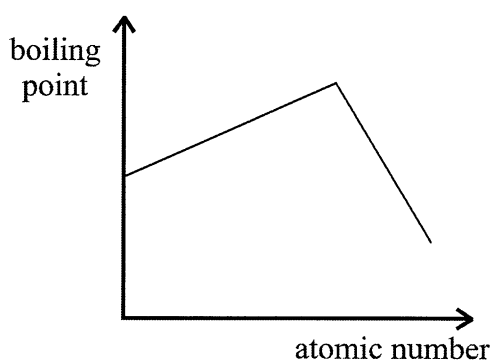
A



B



C



D

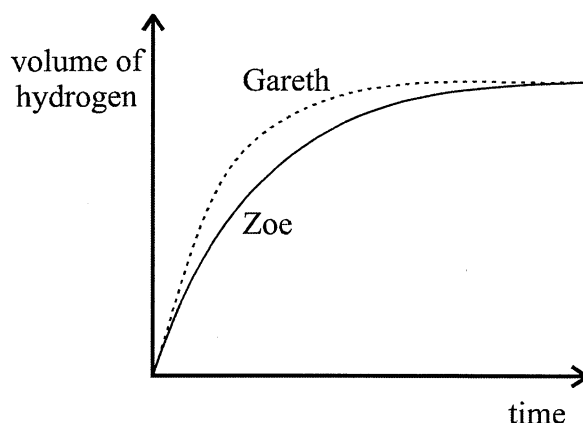
18. Part of the periodic table is shown.

1	2	3	4	5	6	7	0
			H				He
Li	Be	B	C	N	O	F	Ne
Na	Mg	Al	Si	P	S	Cl	Ar

Which element has the electronic structure 2 : 8 : 1?

- A He
- B O
- C Ne
- D Na

19. Gareth and Zoe separately investigated the rate of reaction of powdered magnesium with excess dilute sulfuric acid. They measured how quickly hydrogen was given off. The graph shows the results of both Gareth's and Zoe's work. The same mass of magnesium was used in both experiments.



Which conditions were used in Zoe's experiment?

	temperature of acid	concentration of acid
A	lower than Gareth's experiment	same as Gareth's experiment
B	higher than Gareth's experiment	higher than Gareth's experiment
C	same as Gareth's experiment	same as Gareth's experiment
D	same as Gareth's experiment	higher than Gareth's experiment

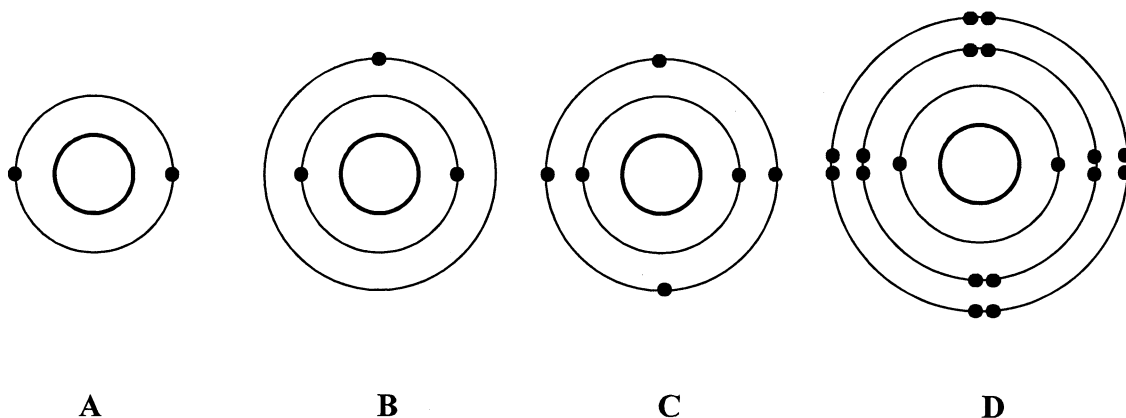
20. Which compound reacts with a solution of bromine?

- A** sodium bromide
- B** sodium chloride
- C** sodium fluoride
- D** sodium iodide

21. Fluorine reacts with sodium iodide.
Which equation correctly shows this reaction?

- A** $F_2 + 2NaI \longrightarrow 2NaF + I_2$
- B** $F_2 + NaI \longrightarrow NaIF_2$
- C** $2F + 2NaI \longrightarrow 2NaF + I_2$
- D** $F + NaI \longrightarrow NaF + I$

22. The electronic structures of four elements are shown.
Which element is the most reactive?



23. X, Y and Z represent three halogens.
X displaces halide ion Z^- .
Y does not displace halide ion X^- or halide ion Z^- .
What is the order of their reactivity?

	most reactive	→	least reactive
A	X	Y	Z
B	X	Z	Y
C	Y	Z	X
D	Z	X	Y

24. Here are two statements about the halogens.

- 1 The halogens have similar chemical properties because they all have seven outer electrons
- 2 The halogens have similar physical properties and they are in the same group of the periodic table

Which statements are correct?

- A** 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

END

Answer all the questions, using the Answer grid.

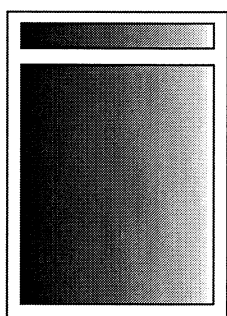
1. Milk is converted to yoghurt by

- A microorganisms
- B chromatography
- C evaporation
- D alkali

2. Salts which are to be used as fertilisers can be made by

- A combustion
- B cracking
- C neutralisation
- D thermal decomposition

3. Poly(chloroethene) is also known as PVC.
It is used to make a



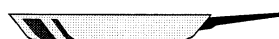
window frame

A



thermometer

B



cooking pan

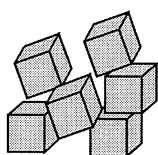
C



coins

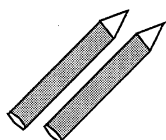
D

4. Limestone is used to make



sugar

A



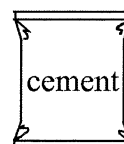
pencils

B



cans

C



cement

D

5. The chemical formula of potassium nitrate is
- A KNO
 - B KNO_3
 - C PNK
 - D PNO_3
6. Which compound has the molecular formula C_3H_8 ?
- A butane
 - B ethane
 - C methane
 - D propane
7. Poly(ethene), poly(propene) and poly(styrene) are all examples of
- A acids
 - B fuels
 - C metals
 - D plastics
8. Incomplete combustion can happen when there is a shortage of
- A carbon dioxide
 - B fuel
 - C carbon monoxide
 - D oxygen

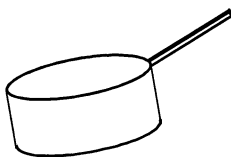
STANDARD DEMAND

9. Glass, cement and iron are all produced using
- A carbon dioxide
 - B calcium carbonate
 - C calcium hydroxide
 - D calcium oxide
10. Biodegradable plastics are useful because they
- A are the strongest type of plastic
 - B produce no fumes when they burn
 - C rot safely in the ground
 - D last for ever

11. Polystyrene is used to make



climbing ropes
A



cooking pans
B



fishing weights
C



hot food containers
D

12. Which word equation represents thermal decomposition?

- A** carbon + oxygen \longrightarrow carbon dioxide
B calcium carbonate \longrightarrow calcium oxide + carbon dioxide
C calcium oxide + water \longrightarrow calcium hydroxide
D calcium hydroxide + hydrochloric acid \longrightarrow calcium chloride + water

13. Crude oil is formed from long term effects of temperature and pressure on

- A** trees
B natural gas
C coal
D marine deposits

14. Crude oil is a mixture of substances. Most of these are

- A** carbohydrates
B hydric carbonates
C hydrocarbons
D hydrogen carbides

15. The table names four products of fractional distillation of crude oil. Which row of the table correctly links a fraction with one of its uses?

	fraction	use of fraction
A	bitumen	motorcycle tyres
B	diesel	road surfacing
C	gasoline	cooking gas
D	kerosene	aircraft fuel

16. The complete combustion (burning) of a hydrocarbon releases
- A carbon dioxide only
 - B carbon dioxide and water only
 - C carbon dioxide and thermal energy only
 - D carbon dioxide, water and thermal energy

HIGH DEMAND

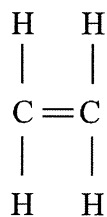
17. What are the correct descriptions of the structures present in alkanes and alkenes?

	alkanes	alkenes
A	saturated	saturated
B	saturated	unsaturated
C	unsaturated	saturated
D	unsaturated	unsaturated

18. Which of the following is a hydrocarbon?

- A CH_3COOH
- B CH_4
- C $\text{C}_2\text{H}_5\text{OH}$
- D CO_2

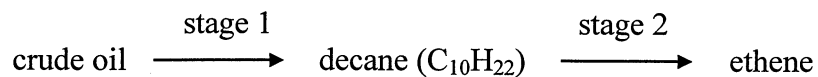
19. The structure of an alkene is shown.



What is its name?

- A butane
- B ethene
- C methane
- D propene

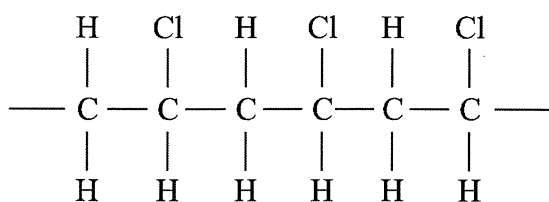
20. Ethene is an important chemical. It is obtained in two stages from crude oil.



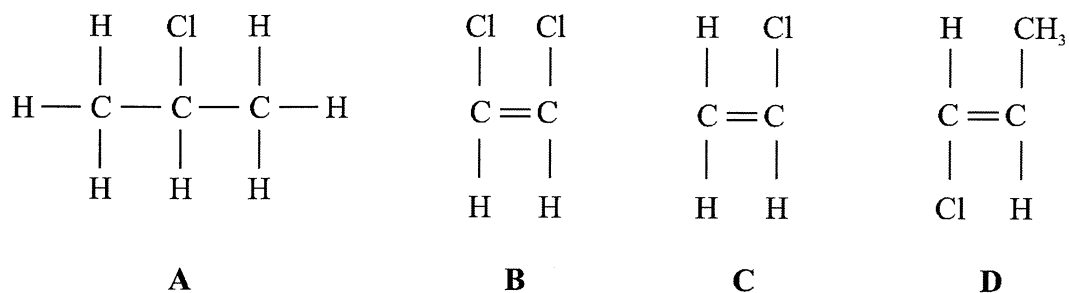
What occurs in stages 1 and 2?

	stage 1	stage 2
A	cracking	Fractional distillation
B	fractional distillation	polymerisation
C	fractional distillation	cracking
D	polymerisation	cracking

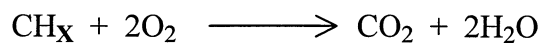
21. The diagram shows part of the structure of an addition polymer.



What is the structure of the monomer?



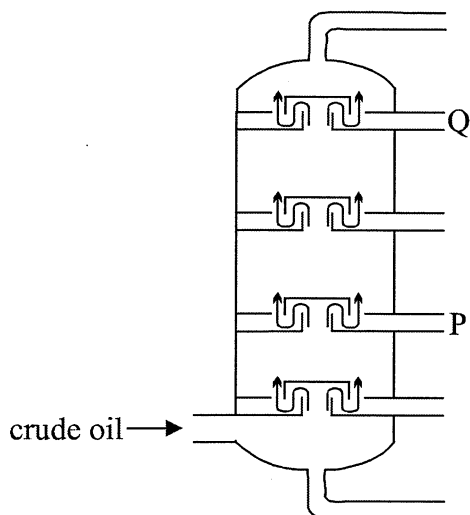
22. A hydrocarbon burns in air according to this equation:



What number should replace X in this equation?

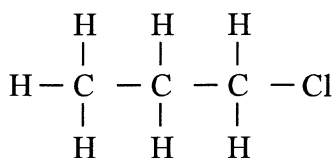
- A** 1
B 2
C 4
D 6

23. The diagram shows how crude oil is separated into fractions.

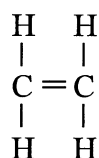


Compared to the fraction given off at P, the fraction given off at Q is

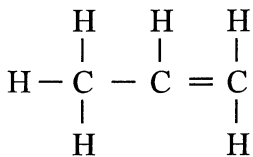
- A cooler and has a longer chain
 - B cooler and has a shorter chain
 - C hotter and has a longer chain
 - D hotter and has a shorter chain
24. Which compound could **not** be used as a monomer to make an addition polymer?



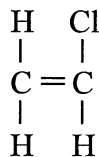
A



B



C



D

END

Answer all the questions, using the Answer grid.

1. Which of these supplies direct current?
A an ammeter
B a battery
C a resistor
D a motor

2. The material which melts in a fuse is made from
A glass
B metal
C plastic
D wood

3. A fuse
A protects the appliance
B is placed in the earth wire
C takes away waste electricity
D changes alternating current to direct current

4. Which of these uses the heating effect of an electric current?
A extractor fan
B vacuum cleaner
C electric motor
D hair dryer

5. Which wire is connected to the fuse in a mains plug?
A live
B earth
C neutral
D cable

6. Some mains appliances use only two wires.
One wire is blue. The other is
A green
B brown
C yellow
D purple

7. The current in an electric fire is 9 A. The correct fuse is
- A 1 A
 - B 3 A
 - C 5 A
 - D 13 A

8. Double insulation means that the appliance has
- A metal wires that are twice as thick as normal
 - B twice as many wires
 - C no metal parts which can be touched
 - D two earth wires

STANDARD DEMAND

9. Which row of the table describes the electricity mains supply?

	type of supply	size of voltage
A	direct current	high
B	direct current	low
C	alternating current	high
D	alternating current	low

- 10.

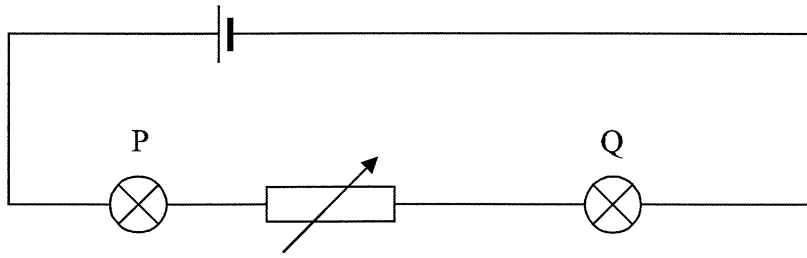
$\text{cost} = \text{power (kW)} \times \text{time (h)} \times \text{cost of 1 kWh}$
--

One kWh of electricity costs 8 p.

How much does it cost, in pence, to keep a 3 kW water heater on for 1.5 hours?

- A 12.5
 - B 24
 - C 36
 - D 2 160
11. A current of 0.5 A passes in a 15 ohm resistor. The voltage across the resistor is
- A 0.5
 - B 7.5
 - C 15
 - D 30

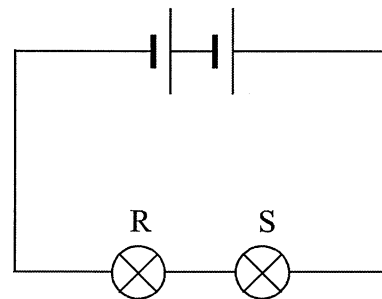
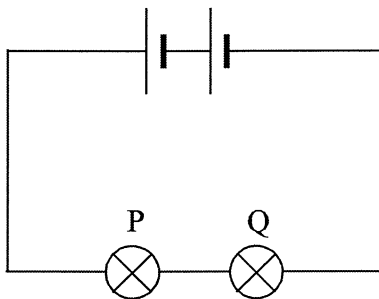
12. Here is a circuit diagram.



The variable resistor is adjusted to give a bigger resistance.
Which row of the table shows the effect on the brightness of P and of Q?

	brightness of P	brightness of Q
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

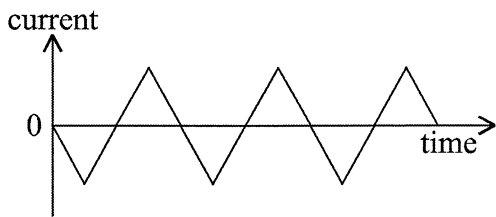
13. Compare these two circuits which contain identical lamps and identical batteries.



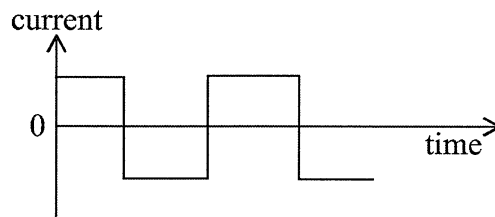
Which of these is true?

- A** Q is as bright as R
- B** P is less bright than R
- C** Q is brighter than S
- D** P is brighter than S

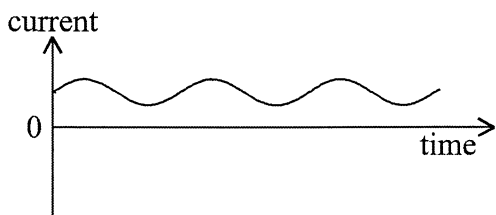
14. Which of these shows a direct current?



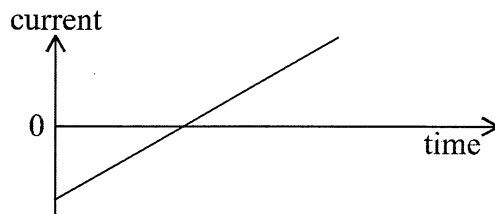
A



B



C



D

15. The resistance of a thermistor

- A** increases when the temperature increases
- B** decreases when the temperature increases
- C** increases when the light intensity increases
- D** decreases when the light intensity increases

16. Electricity can be generated by a wind turbine.
An advantage of a wind turbine is that

- A** no energy is needed to power it
- B** it produces electricity all the time
- C** it does not produce atmospheric pollution
- D** it takes up very little space

HIGH DEMAND

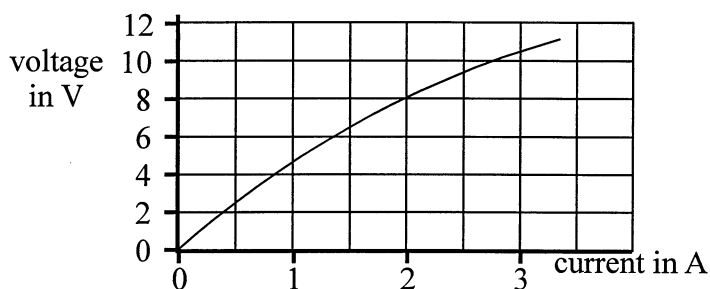
17. A residual current circuit breaker will only cut off the electricity supply if

- A** there is a large current in the live wire
- B** there is a small current in the live wire
- C** the current in the live wire is different from the current in the neutral wire
- D** the current in the live wire is the same as the current in the neutral wire

18. In a power station generator
- A a magnet rotates inside coils of wire
 - B a magnet vibrates inside coils of wire
 - C a coil of wire rotates inside a magnet
 - D a coil of wire vibrates inside a magnet

19. An LDR has its highest resistance when it is
- A cold
 - B in complete darkness
 - C hot
 - D in bright light

20. The graph shows the current in and voltage across a component.



When the current is 2 A, the resistance, in ohms, is

- A 0.25
 - B 4
 - C 8
 - D 16
21. The metal casing of a washing machine must be earthed. This protects anyone using the machine because
- A if the live wire touches the metal case the fuse will melt
 - B the earth wire will melt if a fault develops
 - C the washing machine will not work if the earth wire breaks
 - D if the neutral wire breaks, current will flow through the earth wire instead
22. When a new house is built, insulating foam is placed between the inner and outer walls. This reduces energy transfer because the insulating foam
- A reflects infra-red radiation
 - B reflects heat particles
 - C deflects heat
 - D contains trapped pockets of air

23. An advantage of using an RCCB instead of a fuse is
- A an RCCB costs less than a fuse
 - B an RCCB is only connected to the earth wire
 - C an RCCB operates at a higher current than a fuse
 - D an RCCB takes less time to break the circuit

24. Here are two statements about electrical safety.

- 1 The choice of a fuse depends only on the voltage rating of an appliance
- 2 A fuse relies upon the magnetic effect of an electric current

The correct statements are

- A 1 only
- B 2 only
- C both 1 and 2
- D neither

END

Answer all the questions, using the Answer grid.

1. Our Solar system

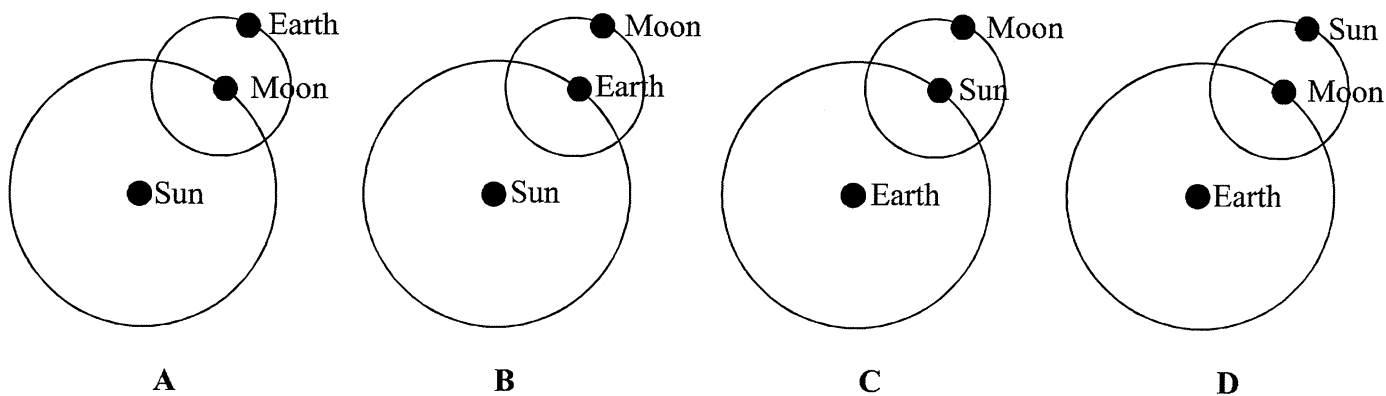
- A is called the Milky Way
- B contains several Universes
- C is part of the Milky Way
- D is a galaxy

2. Radioactivity is the breakdown of an unstable

- A nucleus
- B compound
- C alpha particle
- D beta particle

3. The Earth has a Moon.

Which diagram shows how the Sun, the Earth and the Moon move in their orbits?



4. Radon gas contributes to the background radiation in some areas.
The main source of radon is

- A air
- B trees
- C rocks
- D space

5. What type of wave is used for satellite transmissions?

- A gamma rays
- B radio waves
- C ultraviolet
- D X-rays

6. Light changes speed when it goes from air into glass.
This is called
- A reflection
 - B refraction
 - C deflection
 - D diffraction
7. Sound travels as
- A particles
 - B matter
 - C waves
 - D air
8. A galaxy is made up of
- A millions of stars
 - B a star and its planets
 - C everything we can see from Earth
 - D very large amounts of hydrogen gas

STANDARD DEMAND

9. Which type of radiation comes from a radioactive substance?
- A X-rays
 - B alpha particles
 - C radio waves
 - D ultraviolet rays
10. An alpha particle is a helium nucleus, ${}^4_2\text{He}$.
How many protons and neutrons does it contain?

	protons	Neutrons
A	2	2
B	2	4
C	4	2
D	4	6

11. Ultrasound
- A is a transverse wave
 - B can pass through a vacuum
 - C has a frequency greater than 20 000 Hz
 - D is an electromagnetic wave of high frequency

12. Ultrasound is now used to check the health of unborn babies.
This is because ultrasound
- A vibrates at the same frequency the heart beats
 - B pictures are clearer than X-ray pictures
 - C is less dangerous than X-rays
 - D passes through the skin better than X-rays

13. Comets

- A have elliptical orbits
- B have circular orbits
- C go round the Sun in the same direction as the planets
- D go round the Sun in the opposite direction to the planets

14. A wave moves from left to right like this \longrightarrow .
Which row of the table shows how the particles vibrate?

	longitudinal wave	transverse wave
A	\longleftrightarrow	\longleftrightarrow
B	\longleftrightarrow	\updownarrow
C	\updownarrow	\longleftrightarrow
D	\updownarrow	\updownarrow

15. Some infra-red and ultraviolet waves travel from the Sun to Earth.
In space, they have the same
- A speed
 - B frequency
 - C wavelength
 - D colour

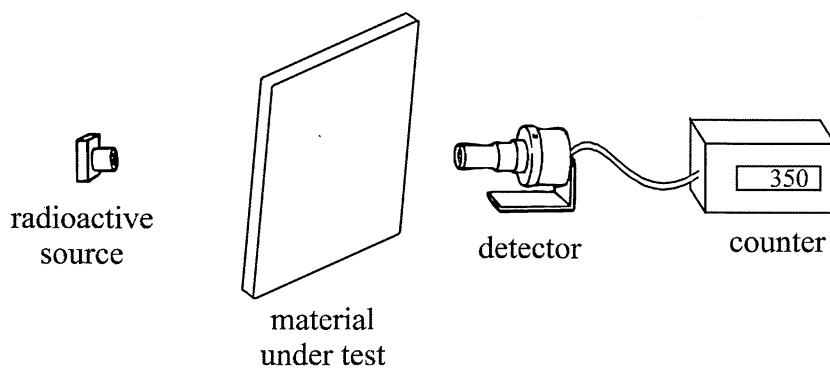
16. Which of these correctly links the electromagnetic wave with its use?

	Wave	use
A	Ultraviolet	cellular telephones
B	infra-red	security detecting systems
C	Radio	night vision camera systems
D	Visible	TV remote control systems

17. Evidence in support of the “Big Bang” theory comes from
- A red shift
 - B blue shift
 - C green shift
 - D yellow shift

Use this information to answer questions 18 and 19.

Selina used this apparatus to investigate the radiation from a radioactive source.



The table shows Selina’s results.

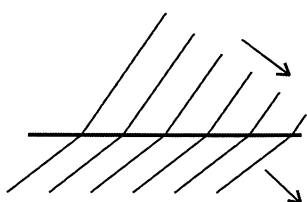
material under test	intensity of radiation (counts/minute)
air	350
thin paper	350
a few mm of aluminium	348
a few cm of lead	60

18. The radiation emitted by the source was
- A beta particles
 - B alpha particles
 - C X-rays
 - D gamma rays
19. When the source was completely removed, Selina noticed that the meter showed a reading of 25 counts/minute. This was due to
- A ultraviolet radiation from the Sun
 - B the bench becoming radioactive
 - C background radiation
 - D thermal radiation from fluorescent lights

20. The speed of a comet in its orbit
- A remains the same
 - B is greatest when the comet is furthest from the Sun
 - C increases as the comet approaches the Sun
 - D decreases as the comet approaches the Sun

21. Compared to X-rays, radio waves have
- A a longer wavelength and a higher speed
 - B the same speed and a lower frequency
 - C the same wavelength and a higher speed
 - D the same speed and a higher frequency

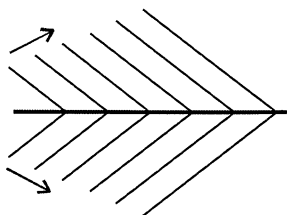
22. Which of these diagrams shows a wave being refracted?



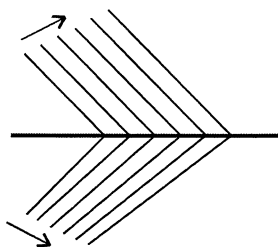
A



B



C



D

23. Which of the following **always** changes when light is refracted?

- A the direction
- B the speed
- C the frequency
- D the colour

24. Here are two statements about the problems of disposing of nuclear waste.

- 1 Some radioactive materials are gases and could pollute the atmosphere
- 2 Some radioactive materials are soluble in water and could pollute the ground

The correct statements are

- A** 1 only
- B** 2 only
- C** both 1 and 2
- D** neither

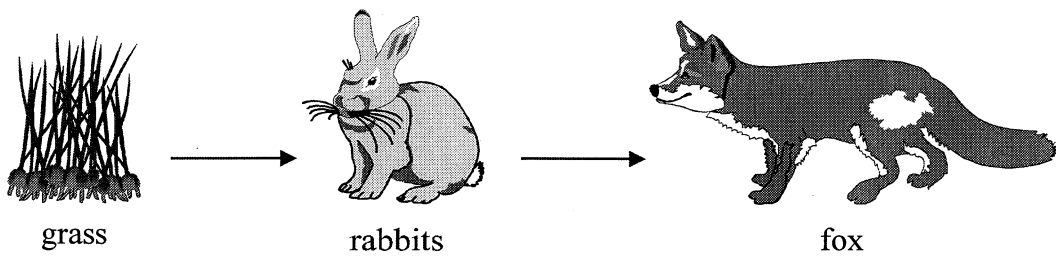
END

Answer all the questions, using the Answer grid.

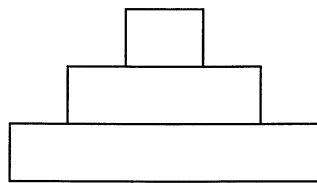
1. The function of a root hair is to

- A absorb light
- B attract insects
- C take in water
- D trap bacteria

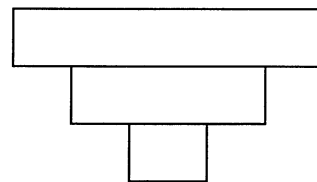
2. A food chain in a field is shown below.



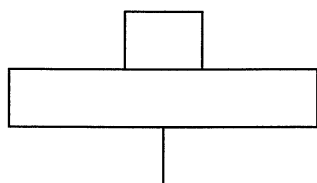
Which diagram shows the pyramid of biomass for this food chain?



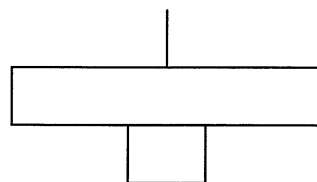
A



B

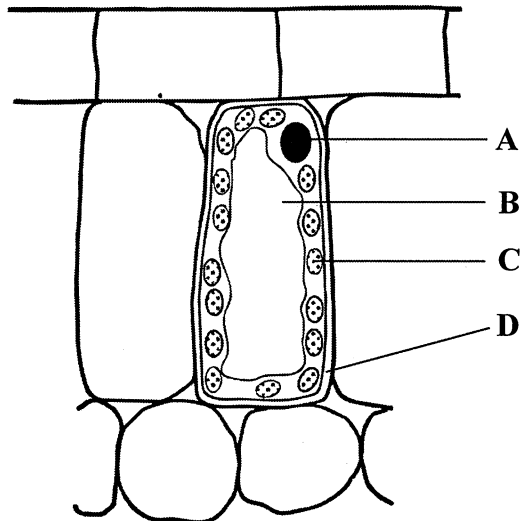


C



D

3. The diagram shows parts of one cell in a leaf.



Which part is also found in an animal cell?

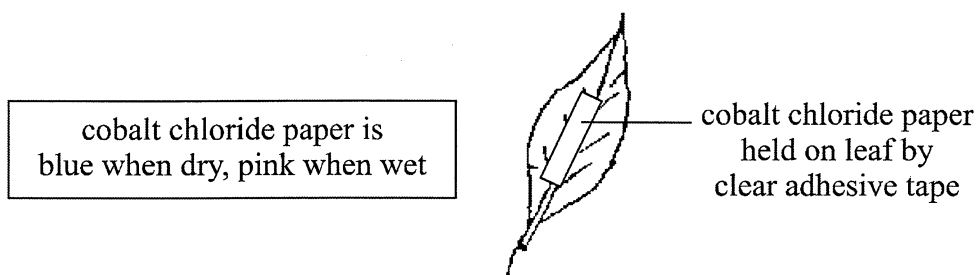
4. Microorganisms cause
- A transpiration
 - B photosynthesis
 - C fertilisation
 - D decay
5. Which of these chemicals is used to kill weeds?
- A herbicide
 - B insecticide
 - C bactericide
 - D fungicide
6. Leaves which fall from trees decay because
- A birds feed on them
 - B squirrels make nests from them
 - C microorganisms feed on them
 - D spiders make webs over them
7. Potato peel will decay in a compost heap.
This will happen most quickly if the heap is
- A warm and moist
 - B warm and dry
 - C cold and dry
 - D cold and moist

8. Which two parts of a plant cell are also found in animal cells?

- A cytoplasm and nucleus
- B cytoplasm and cell wall
- C vacuole and nucleus
- D vacuole and cell wall

STANDARD DEMAND

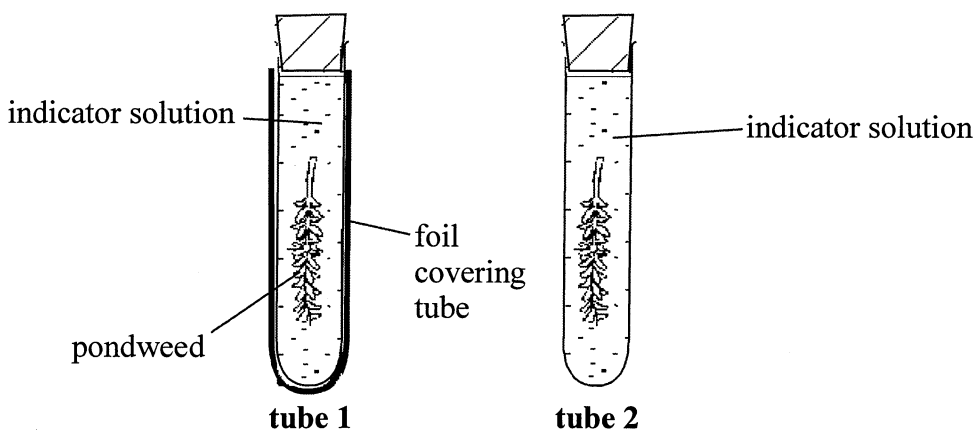
9. Pieces of cobalt chloride paper were placed on the upper and lower surfaces of a leaf as shown in the diagram.



The leaf was observed for 30 minutes.
What happened to the colour of the cobalt chloride paper?

- A It went pink on the upper surface first
- B It went pink on the lower surface first
- C It went pink on both surfaces at the same time
- D It did not go pink on either surface

10. Some pupils set up the apparatus shown below. They put both tubes in the light.



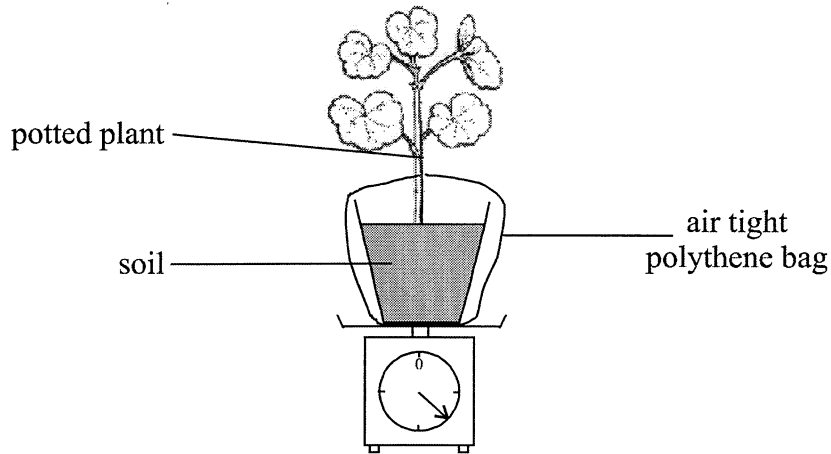
Which row of the table shows the processes taking place in each tube?

	tube 1		tube 2	
	photosynthesis	Respiration	photosynthesis	respiration
A	X	X	✓	X
B	✓	✓	X	X
C	X	✓	✓	✓
D	✓	X	✓	✓

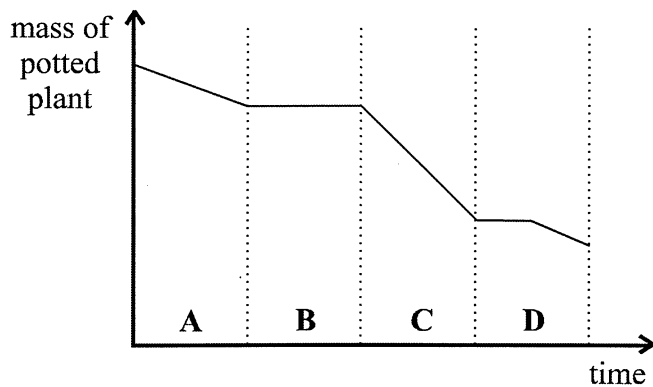
11. Which of these takes water to a leaf?

- A phloem
- B root hairs
- C stomata
- D xylem

12. The diagram shows a potted plant on a balance. The mass of the potted plant was recorded every 10 minutes.



The graph shows the change in mass over a number of hours.



During which period of time was transpiration fastest?

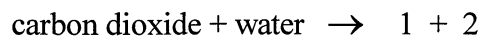
13. Plant hormones have many commercial uses. Which of these is **not** a commercial use of plant hormones?

- A developing fruits
- B killing weeds
- C rooting cuttings
- D pollinating flowers

14. Which of these is **not** a cause of deforestation?

- A development of more towns
- B increased use of pesticides
- C greater use of wood as a fuel
- D the use of more land for farming

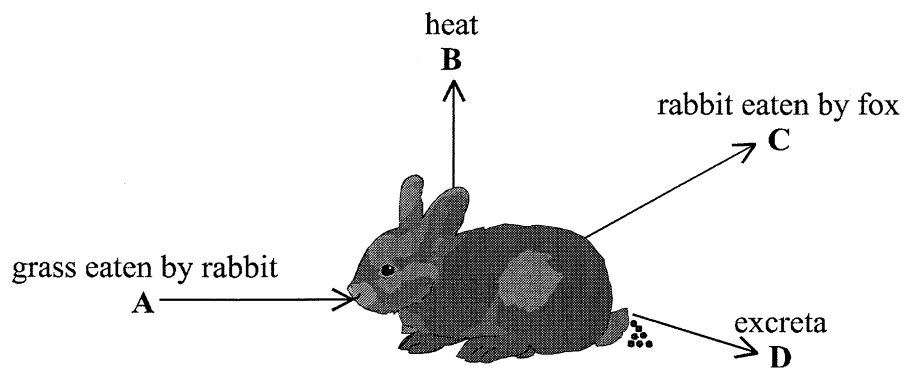
15. The equation below represents photosynthesis.



What are substances 1 and 2?

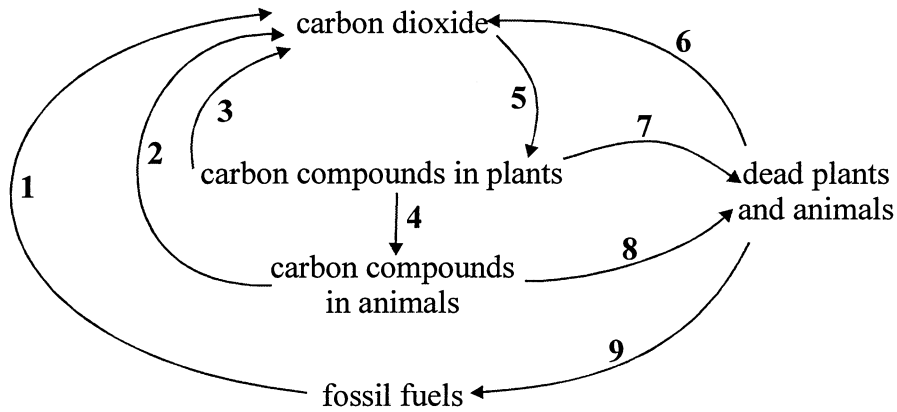
- A glucose and oxygen
- B glucose and water
- C chlorophyll and glucose
- D sunlight and oxygen

16. The diagram shows part of a food chain.



Which of the arrows represents the largest transfer of energy?

Use information in the diagram of the carbon cycle to answer questions 17 and 18.



17. Which row in the table names processes 1 and 3?

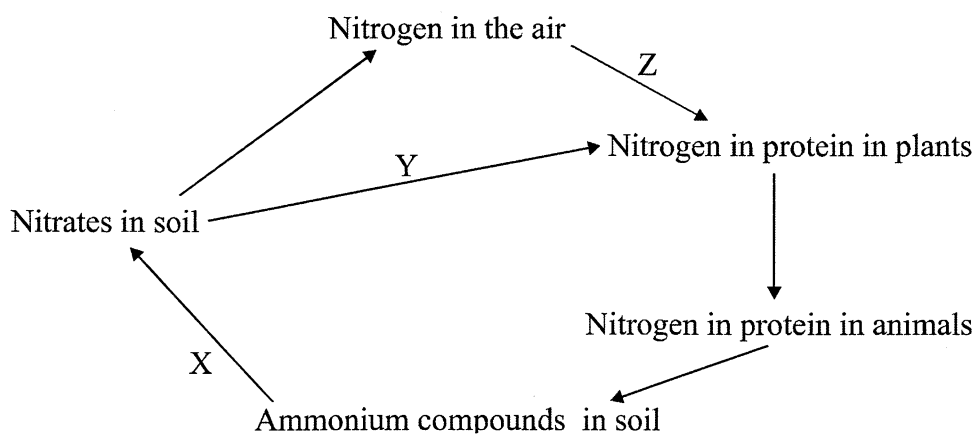
	process 1	process 3
A	combustion	photosynthesis
B	combustion	respiration
C	respiration	combustion
D	respiration	photosynthesis

18. Which forms extra biomass?

- A** 4
- B** 5
- C** 7
- D** 9

HIGH DEMAND

19. The diagram shows some stages in the nitrogen cycle.



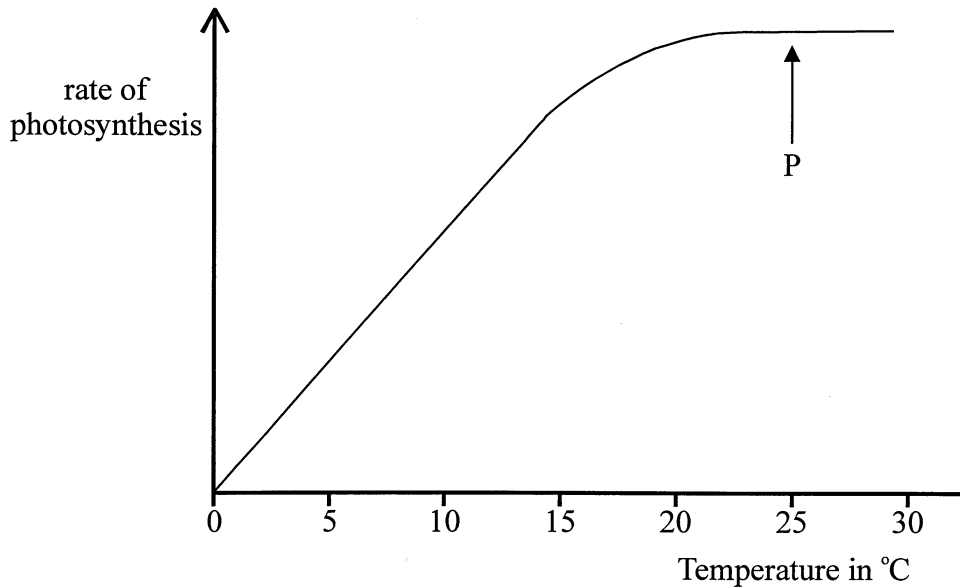
Which stages involve bacteria?

- A** Z only
- B** X and Y only
- C** X and Z only
- D** X, Y and Z

20. The rate of transpiration is affected by the weather.
Which row of the table shows the effect of it starting to rain and becoming windy?

	effect on rate of transpiration	
	starting to rain	becoming windy
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

21. A group of pupils investigated the rate of photosynthesis in a water plant at different temperatures. The results are shown on the graph.



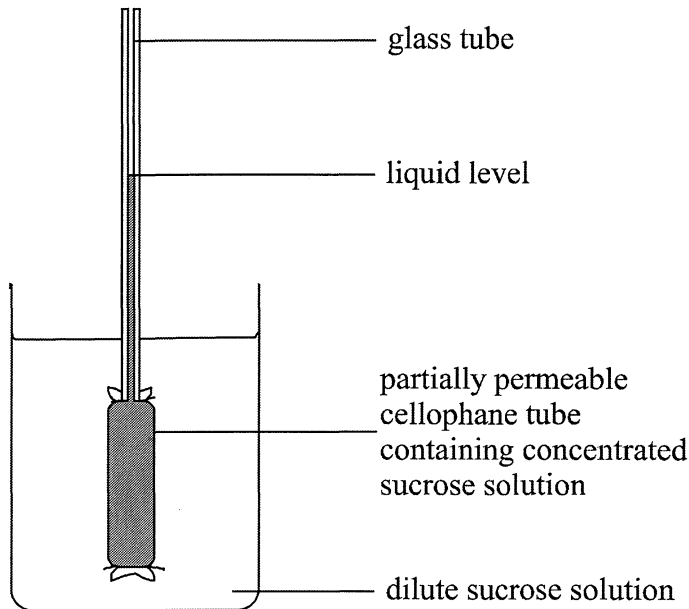
What limits the rate of photosynthesis at P?

- A carbon dioxide concentration
 - B temperature
 - C oxygen concentration
 - D availability of water
22. Which of these causes of deforestation will cause **least** change to the carbon dioxide content of the air?
- A growing crops on the land
 - B using the timber for fuel
 - C building roads on the land
 - D using the timber for furniture

23. Which process needs energy from respiration?

- A absorption of mineral salts by roots
- B loss of water vapour by leaves
- C movement of water up the stem
- D uptake of carbon dioxide by leaves

24. The diagram shows apparatus set up to demonstrate osmosis.



Which row of the table gives the results expected after 24 hours, and the correct explanation?

	change in water level in glass tube	explanation
A	fall	concentrated sucrose solution moves out of the cellophane tube
B	rise	dilute sucrose solution moves into cellophane tube
C	fall	water molecules from cellophane tube move into beaker
D	rise	water molecules from beaker move into cellophane tube

END

Answer all the questions, using the Answer grid.

1. Which of these causes muscle cramp?

- A alcohol
- B carbon dioxide
- C lactic acid
- D oxygen

2. When a cell respire it needs

- A carbon dioxide
- B oxygen
- C heat
- D smoke

3. Which row of the table shows what happens to a runner during a race?

	pulse rate	breathing rate
A	increases	increases
B	increases	decreases
C	decreases	increases
D	decreases	decreases

4. Which of these is likely to improve fitness?

- A drinking alcohol
- B eating fatty foods
- C regular exercise
- D smoking cigarettes

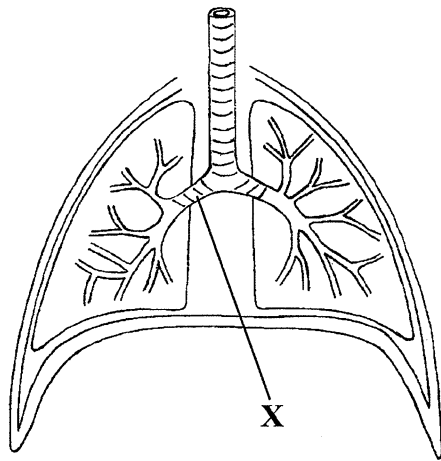
5. Which process releases energy from food?

- A ventilation
- B respiration
- C inhalation
- D diffusion

6. Your pulse is caused by

- A air being pumped down the bronchi
- B air being pumped up the windpipe
- C blood being pumped along an artery
- D blood being pumped along a vein

7. The diagram shows a section through the chest.



X is

- A a bronchus
 - B the diaphragm
 - C the rib-cage
 - D the windpipe
8. Capillaries allow substances to pass between blood and body cells.
Capillaries
- A have elastic walls
 - B have very thin walls
 - C have valves in their walls
 - D are wide for good blood flow

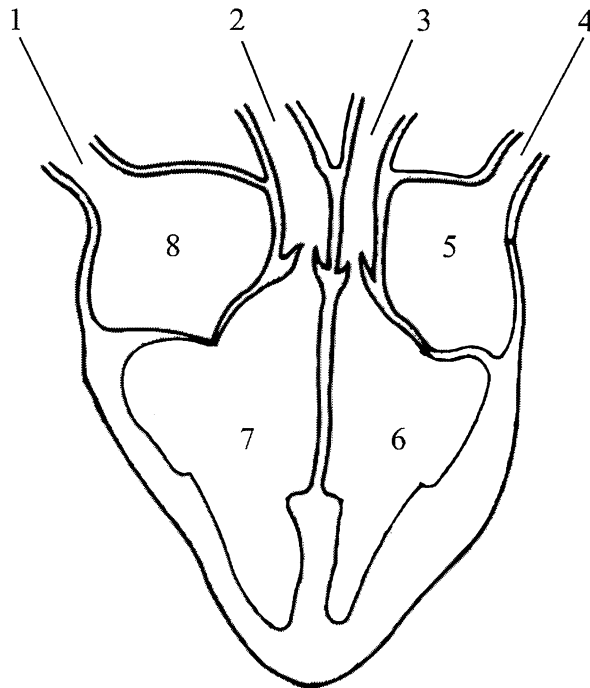
STANDARD DEMAND

9. The muscles which move the ribs during breathing are called
- A alveolar muscles
 - B coronary muscles
 - C pulmonary muscles
 - D intercostal muscles
10. Respiration is the
- A release of energy from glucose
 - B pumping of air into the lungs
 - C release of sweat onto the skin
 - D resuscitation of a person who has stopped breathing

11. Which statement about blood vessels is correct?
- A Veins have valves which push blood forward
 - B Veins have valves which stop blood flowing backwards
 - C Arteries have valves which stop blood flowing backwards
 - D Arteries have valves which push blood forward

12. Air will flow into the lungs when
- A the diaphragm muscles contract
 - B the ribs move down and in
 - C the diaphragm rises
 - D the lungs are squashed

Use the diagram of the heart to answer questions 13 and 14.

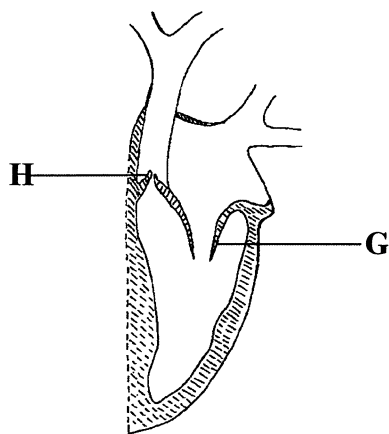


13. Which blood vessel carries blood to all parts of the body except the lungs?
- A 1
 - B 2
 - C 3
 - D 4
14. Blood with a high concentration of oxygen enters the heart at **chamber**
- A 5
 - B 6
 - C 7
 - D 8

15. Which of these helps air to enter the lungs?
- A the temperature of the air
 - B the pressure of the air
 - C the amount of oxygen in the air
 - D the amount of water in the air
16. Carbon dioxide passes from the blood into the alveoli of the lungs by
- A circulation
 - B ventilation
 - C respiration
 - D diffusion

HIGH DEMAND

17. The blood leaving the arm muscles of a weight lifter is different from the blood entering the muscles.
The blood leaving has
- A a lower temperature
 - B more red blood cells
 - C a higher concentration of oxygen
 - D a lower concentration of glucose
18. The diagram shows an internal view of the heart.
There are valves in positions **G** and **H**.

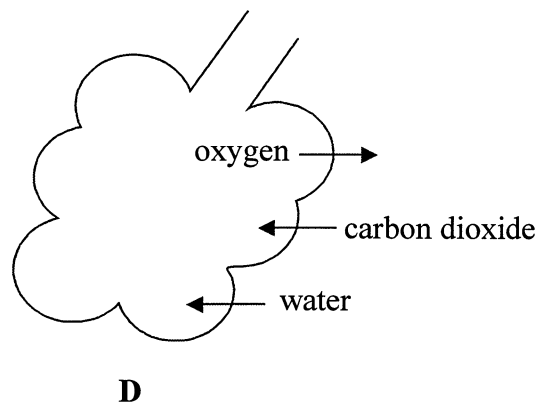
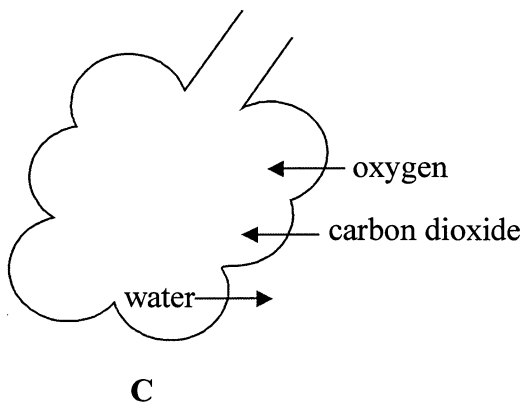
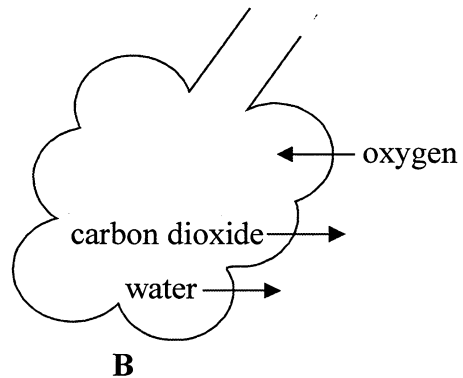
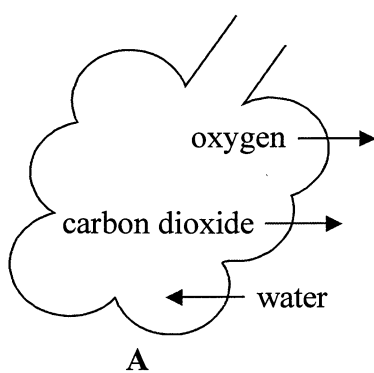


What happens to these valves when the ventricle contracts?

	valve G	valve H
A	opens	opens
B	opens	closes
C	closes	opens
D	closes	closes

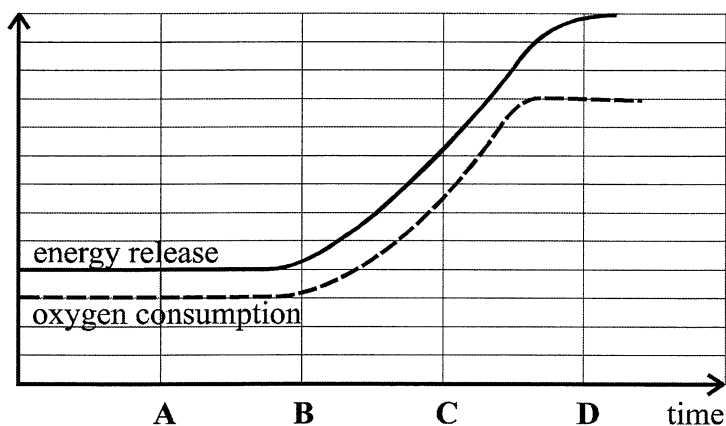
19. An oxygen debt occurs in muscles when
- A the pulse rate is increased to deliver more glucose
 - B the muscles need more oxygen than the lungs absorb
 - C we breathe out more carbon dioxide than we breathe in
 - D lactic acid is removed from the blood leaving the muscles
20. Which of these carries blood with the highest concentration of carbon dioxide?
- A an artery carrying blood from the lungs to the heart
 - B an artery carrying blood from the heart to the lungs
 - C a vein carrying blood from the lungs to the heart
 - D a vein carrying blood from the heart to the lungs

21. Each diagram shows an alveolus and possible movements of substances through its wall.



Which diagram shows what happens during normal breathing?

22. The graph shows the oxygen consumption and energy release during a period of exercise.



When might the conditions cause an oxygen debt?

23. Which of these occurs to move air into the lungs?

	movement of ribs or diaphragm	effect on the lungs
A	diaphragm curves upwards	volume of lungs increases
B	diaphragm becomes flat	pressure in lungs decreases
C	ribs swing down and inwards	pressure in lungs increases
D	ribs swing up and outwards	volume of lungs decreases

24. Here are three statements about respiration in humans.

- 1 Energy is released only during anaerobic respiration
- 2 Glucose is used up in both aerobic and anaerobic respiration
- 3 Only aerobic respiration uses oxygen

The correct statements are

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

END