UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS General Certificate of Education Ordinary Level				
OMBINED SCIEM	ICE	5129/01		
per 1 Multiple C	hoice	October/November 2004		
ditional Materials:	Multiple Choice Answer Sheet Soft clean eraser Soft pencil (type B or HB is recorr	1 hour		

#### READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

Do not use staples, paper clips, highlighters, glue or correction fluid. Write your name, Centre number and candidate number on the answer sheet in the spaces provided unless this has been done for you.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A**, **B**, **C**, and **D**.

Choose the one you consider correct and record your choice in soft pencil on the separate answer sheet.

#### Read the instructions on the Answer Sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this booklet. A copy of the Periodic Table is included on page 20.

This document consists of 17 printed pages and 3 blank pages.



**1** A stone falls freely under gravity.

What is meant by the acceleration of the stone?

- **A** The distance the stone falls in one second.
- **B** The increase in speed of the stone.
- **C** The increase in speed of the stone in one second.
- **D** The time for the stone to reach maximum speed.
- 2 The table shows the weights of some masses on the surface of four different planets.

Which planet has the greatest gravitational field strength?

	mass	weight
Α	0.5 kg	20 N
В	2.0 kg	20 N
С	0.5 kg	40 N
D	2.0 kg	40 N

3 The diagrams show the same spring with different weights attached.



When the weights are removed, the spring returns to its original length.

What is the original length of the spring?

<b>A</b> 25 cm <b>B</b> 20 cm <b>C</b> 15 cm <b>D</b>	10 cm
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4 Brakes are used to stop a car.

What is most of the kinetic energy converted into?

- A heat energy
- B light energy
- **C** potential energy
- **D** sound energy
- 5 The diagram shows a dipper producing circular waves in a ripple tank.



Which wave property describes the number of waves passing point X per second?

- A wavelength
- **B** speed
- C frequency
- D amplitude
- 6 Which diagram shows a useful application of thermal expansion?



- 7 What is a property of all electromagnetic waves?
  - **A** They are deflected by magnets.
  - **B** They are positively charged.
  - **C** They travel at the speed of sound.
  - **D** They travel through a vacuum.

8 Which circuit can be used to find the resistance of the lamp?



**9** In the circuit shown, the brightness of the lamp can be altered by changing the resistance of the variable resistor, R.



This is because varying the resistance changes

- A the current flowing in the circuit.
- **B** the electromotive force (e.m.f) of the battery.
- **C** the resistance of the bulb.
- **D** the temperature of the battery.
- **10** A heater used on a 250 V mains circuit has a 5 A fuse in its plug.

Which is the highest power rating for this heater?

Α	50 W	В	250 W	С	1000 W	D	2000 W
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**11** The diagram shows the north pole of a magnet moved into, and out of, a coil of wire.



What describes the poles produced in the coil at **X** by the movement of the magnet?

	north pole in	north pole out
Α	Ν	Ν
В	Ν	S
С	S	Ν
D	S	S

**12** The table shows how the activity of a radioactive substance changes over a period of time. (Allowance has been made for the background radiation.)

time/minutes	0	5	10	15	20	25	30	35	40
activity/counts per second	114	102	90	83	73	65	57	51	45

What is the half-life of the substance?

- A 73 minutes
- B 57 minutes
- C 30 minutes
- D 20 minutes
- **13** What particles are present in the nucleus of the oxygen nuclide  ${}^{17}_{8}$ O?

	neutrons	protons
Α	9	8
В	17	8
С	8	9
D	9	17

- 14 Which statement about the molecules in carbon dioxide gas is correct?
  - **A** The molecules are close together.
  - **B** The molecules are diatomic.
  - **C** The molecules are in fixed positions.
  - **D** The molecules move randomly.
- **15** Which piece of apparatus would be most suitable to measure accurately the volume of acid needed to neutralise 25.0 cm<sup>3</sup> of an alkali?





**16** Which diagram shows the structure of a  $\frac{7}{3}$ Li atom?

- 17 Which statement describes the formation of a chloride ion from a chlorine atom?
  - **A** The atom gains one electron.
  - **B** The atom gains two electrons.
  - **C** The atom loses one electron.
  - **D** The atom loses two electrons.
- 18 Which mass of oxygen combines with 12g of magnesium?
  - **A** 4g
  - **B** 8g
  - **C** 16g
  - **D** 32g
- **19** Which salt can be prepared by the reaction between a soluble metal hydroxide and dilute sulphuric acid?
  - **A** copper(II) sulphate
  - **B** iron(II) sulphate
  - **C** lead(II) sulphate
  - **D** potassium sulphate

20 Many crops will not grow well in an acidic soil.

Which type of chemical reaction takes place when farmers add calcium hydroxide to the soil?

- A decomposition
- B fertilisation
- **C** neutralisation
- D reduction
- 21 Experiments are carried out to arrange metals X, Y and Z in order of decreasing reactivity.

The table shows the results.

experiment	Х	Y	Z
Does the metal liberate hydrogen from dilute hydrochloric acid?	yes	no	yes
Is the metal oxide reduced by heating with carbon?	yes	yes	no

What is the order of reactivity of the metals?

	most reactive	e — → I	east reactive
Α	Х	Z	Y
В	Y	Х	Z
С	Z	Х	Y
D	Z	Y	х

22 Iron filings are left to rust in the apparatus shown.

Which letter indicates the water level when all the oxygen has reacted?



- **23** The following gases are present in car exhaust fumes.
  - carbon dioxide
- nitrogen dioxide
- carbon monoxide
- water vapour
- nitrogen

Which of these gases is also present in unpolluted air?

- A nitrogen only
- B nitrogen and water vapour only
- **C** nitrogen, carbon dioxide and water vapour only
- D nitrogen, carbon monoxide, carbon dioxide and water vapour only
- 24 Which statement about the homologous series of alcohols is not true?
  - A They all contain oxygen.
  - **B** They can be represented by a general formula.
  - **C** They exhibit a gradual change in physical properties.
  - **D** They have the same empirical formula.
- **25** The structures of four organic compounds are shown.



Which compounds decolourise aqueous bromine?

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

26 Methane is used as a fuel.

Which property is essential for this use?

- A It burns exothermically.
- **B** It is a gas.
- **C** It is odourless.
- **D** It has a low boiling point.

27 The following formula represents a monomer.



Which formula shows a part of the polymer chain formed from 3 molecules of the monomer?

- 28 Which feature of a root hair cell indicates that it is from a plant and not from an animal?
  - A cell membrane
  - B cell wall
  - C chloroplast
  - D cytoplasm

**29** The graph shows the relationship between temperature and the activity of the enzyme amylase that breaks down starch to sugar.



From the graph, which statement is correct?

- A Amylase works best at 55 °C.
- **B** Starch will not be broken down below 10°C.
- **C** Sugar is produced most rapidly at 45 °C.
- **D** The higher the temperature, the faster the amylase works.
- 30 What is the correct equation for photosynthesis?
  - A carbohydrate + oxygen  $\rightarrow$  water + carbon dioxide
  - **B** carbohydrate + carbon dioxide  $\rightarrow$  oxygen + water
  - **C** carbon dioxide + oxygen  $\rightarrow$  carbohydrate + water
  - **D** carbon dioxide + water  $\rightarrow$  carbohydrate + oxygen

**31** The diagram shows some food moving along the alimentary canal by peristalsis.



What are the muscles in the wall of the alimentary canal doing at point X?

	circular muscles	longitudinal muscles
Α	contracting	contracting
в	contracting	relaxing
С	relaxing	contracting
D	relaxing	relaxing

**32** A woman has fewer red blood cells than normal.

What would be the effect of this?

- **A** Her blood contains high levels of urea.
- **B** Her blood does not clot properly.
- **C** Her body cells do not get enough oxygen.
- **D** She cannot fight off infections.
- **33** What are the conditions in the muscles when lactic acid is produced?

	concentration of carbon dioxide	supply of oxygen
Α	high	less than oxygen demand
В	high	more than oxygen demand
С	low	less than oxygen demand
D	low	more than oxygen demand

**34** The diagram shows a section through the eye.



Which pair of structures focus light rays onto the retina?

- A P and Q
- B P and R
- C Q and R
- D Q and S
- 35 What may happen to a heroin addict 48 hours after the drug is withdrawn?
  - A Desire for the drug is reduced.
  - **B** The addiction is cured.
  - **C** Tolerance to the drug increases.
  - **D** Vomiting, sweating and cramp occur.

36 The diagram shows a food web from a freshwater pond.



Which organisms are herbivores and which are carnivores?

	herbivores	carnivores
Α	small fish	large fish
В	tadpoles	frogs
С	water fleas	insect larvae
D	water plants	water beetles

**37** The diagram shows the carbon cycle.



Which parts of the cycle form parts of food chains?

- A P and Q
- B P and S
- C Q and R
- D R and S

	light	oxygen	water		
Α	$\checkmark$	$\checkmark$	x		
в	X	$\checkmark$	x		
С	$\checkmark$	×	$\checkmark$		
D	X	$\checkmark$	$\checkmark$		

38 What conditions are needed for the germination of most seeds?

**39** The diagram shows a section of a seed.



What are the numbered parts?

	1	2	3	
Α	cotyledon	plumule	radicle	
в	plumule	cotyledon	radicle	
С	plumule	radicle	cotyledon	
D	radicle	plumule	cotyledon	

**40** The diagram shows part of the male reproductive system.



Which structures produce seminal fluid and sperm?

	seminal fluid	sperm			
Α	Р	Q			
в	Q	R			
С	R	S			
D	S	т			

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DATA SHEET The Periodic Table of the Elements

	0	4 Heium 2	20 Neon 10 Argon 18	84 <b>Kr</b> Krypton 36	131 <b>Xe</b> Xenon 54	Rn Radon 86		175 <b>Lu</b> Lutetium 71	Lr Lawrencium 103
Group	١N		19 9 35.5 <b>C 1</b> 17 Chlorine	80 <b>Br</b> 35	127 I lodine 53	At Astatine 85		173 <b>Yb</b> Ytterbium 70	NO Nobelium 102
	N		16 Oxygen 32 32 32 16 Suphur 16 Suphur	79 Selenium 34	128 <b>Te</b> Tellurium 52	Po Polonium 84		169 Thulium 69	Md Mendelevium 101
	>		14 Nitrogen 31 Phosphorus 15	75 <b>AS</b> Arsenic 33	122 Sb Antimony 51	209 <b>Bi</b> Bismuth		167 <b>Er</b> Erbium 68	Fermium 100
	$\geq$		12 Carbon 6 28 28 Silicon	73 <b>Ge</b> Germanium 32	119 <b>Sn</b> 50	207 <b>Pb</b> Lead 82		165 <b>HO</b> Holmium 67	ES Einsteinium 99 (r † n )
	≡		11 B Boron 5 27 Atuminium 13	70 <b>Ga</b> Gallium 31	115 In Indium 49	204 <b>T1</b> Thallium 81		162 Dysprosium 66	Cf californium 98
				65 <b>Zn</b> 30	112 <b>Cd</b> cadmium 48	201 <b>Hg</b> <sup>Mercury</sup> 80		159 <b>Tb</b> <sup>Terbium</sup> 65	Bk Berkelum 97 afture and
				64 <b>Cu</b> Copper	108 <b>Ag</b> Silver	197 <b>Au</b> Gold 79		157 <b>Gd</b> Gadolinium 64	96 curium Democra
				59 Nickel 28	106 Pd Palladium 46	195 Pt Platinum 78		152 <b>Eu</b> Europium 63	Americium 95 m <sup>3</sup> at roor
			,	59 <b>CO</b> <sup>27</sup>	103 <b>Rh</b> Rhodium 45	192 Ir Iridium 77		150 Samarium 62	Putonium 94 SS is 24 d
		Hydrogen		56 <b>Fe</b> Iron 26	101 <b>Ru</b> Ruthenium	190 <b>Os</b> Osmium 76		Promethium 61	Neptunium 93 Of any 05
				55 Mn <sup>Manganese</sup> 25	Tc Technetium 43	186 <b>Re</b> Rhenium 75		144 Neodymium 60	<sup>238</sup> <sup>Uranium</sup> 92 One mole
				52 <b>Cr</b> Chromium 24	96 <b>Mo</b> Molybdenum 42	184 <b>V</b> Tungsten 74		141 Pr Praseodymium 59	Protactinium 91 OLLIME OF
				51 Vanadium 23	93 Niobium 41	181 <b>Ta</b> Tantalum 73		140 <b>Ce</b> Cerium 58	232 Thorium 90 The V
				48 TT <sup>Titanium</sup> 22	91 Zr Zirconium 40	178 Hafnium 72			nic mass 1bol nic) number
				45 Scandium 21	89 Yttrium 39	139 La Lanthanum 57 *	227 Actinium 89	l series eries	<ul> <li>= relative ator</li> <li>= atomic syrr</li> <li>= proton (ator</li> </ul>
	=		9 Beryllium 24 Magnesium	40 <b>Ca</b> calcium 20	88 <b>Sr</b> 38	137 <b>Ba</b> Barium 56	226 <b>Rad</b> ium 88	anthanoic Actinoid s	р <b>Х</b> а
	_		7 Lithium 3 Lithium 23 23 23 14 Sodium	39 <b>K</b> Potassium 19	85 <b>Rb</b> Rubidium 37	133 CS Caesium 55	<b>Fr</b> Francium 87	*58-71 L 90-103 /	ه ۲

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