5129/01	NCE	COMBINED SCIE
	Choice	Paper 1 Multiple (
May/June 2006		
1 hou		
	Multiple Choice Answer Sheet	Additional Materials:
	Soft clean eraser	
	Soft pencil (type B or HB is recommended)	

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 printed on page 16.

This document consists of 16 printed pages.



1 A constant force causes a car to accelerate.

Which graph shows how the speed of the car varies with time?



2 A quantity of water is poured into a measuring cylinder. A small piece of rock is then added carefully.

The two diagrams show the water levels and the measuring cylinder scales.



What are the correct values for the volumes of water and rock?

	volume of water/cm ³	volume of rock/cm ³
Α	32.5	22.0
в	32.5	54.5
С	35.0	24.0
D	35.0	59.0

- What is the weight W of the metre rule? **A** 1N **B** 4N **C** 16N **D** 40N
- 3 A uniform metre rule is balanced by a 4 N weight as shown in the diagram.

- 4 Which property of a body **cannot** be changed if a force is applied to it?
 - A its mass
 - B its shape
 - **C** its size
 - D its velocity
- 5 What are the energy changes in hydroelectric power production?
 - $\textbf{A} \quad \text{kinetic} \rightarrow \text{electrical} \rightarrow \text{potential}$
 - **B** kinetic \rightarrow potential \rightarrow electrical
 - $\textbf{C} \quad \text{potential} \rightarrow \text{electrical} \rightarrow \text{kinetic}$
 - $\textbf{D} \quad \text{potential} \rightarrow \text{kinetic} \rightarrow \text{electrical}$
- 6 The earliest Ford cars were always painted black. This was because black paint dried more quickly than lighter colours when the cars were left in the sun to dry.

Which property of black paint makes it dry more quickly?

- **A** It is the best absorber of heat.
- **B** It is the best conductor of heat.
- **C** It is the best insulator of heat.
- D It is the best reflector of heat.

7 Water waves are produced in a ripple tank using a vibrator of frequency 3 Hz.

Which values of speed and wavelength could the waves have?

	speed/cm per s	wavelength/cm
Α	1	3
в	5	15
С	6	2
D	12	6

- 8 When a converging lens is used as a magnifying glass, what is the nature of the image?
 - A real and inverted
 - **B** real and upright
 - **C** virtual and inverted
 - **D** virtual and upright
- 9 The diagram shows an electric circuit.



Which pair of readings is obtained when a suitable power supply is connected to X and Y?

	voltmeter	ammeter
Α	2V	6A
В	2V	0.5 A
С	12 V	0.5 A
D	12 V	2A

10 A current of 6 A flows in the circuit shown. The current splits up when it enters parallel branches of resistors.



- 11 Which properties make materials suitable for use as a core in an electromagnet?
 - **A** difficult to magnetise and easy to demagnetise
 - **B** difficult to magnetise and retains magnetic strength
 - **C** easy to magnetise and demagnetise
 - **D** easy to magnetise and retains magnetic strength
- 12 In the simple model of an atom, X orbits around Y.



What are X and Y?

	X	Y
Α	electron	nucleus
В	neutron	electron
С	nucleus	proton
D	proton	neutron

13 X, Y and Z are three types of radiation.

X is almost completely absorbed by 5 cm lead but not by 5 mm aluminium.Y is almost completely absorbed by 5 mm aluminium but not by thin card.

Z is absorbed by thin card.

What are X, Y and Z?

	X	Y	Z
Α	alpha	beta	gamma
в	beta	alpha	gamma
С	gamma	alpha	beta
D	gamma	beta	alpha

14 A gas, X, is less dense than air and insoluble in water.

Which method cannot be used to collect the gas?











- 15 Which particle contains 10 electrons and 12 neutrons?
 - **A** ¹⁹₉F⁻
 - **B** ²⁴₁₂Mg
 - $C_{11}^{23}Na^+$
 - D ²¹₁₀Ne
- **16** Each atom of element Q contains 2 electrons in its outermost shell.

Each atom of element J contains 7 electrons in its outermost shell.

What is the formula of the compound formed when Q and J combine?

17 The diagram shows the outer shell electrons in the compound YZ_2 .



electrons of Y atom

 $\times~$ electrons of ${\bf Z}$ atom

Which pair of elements could be Y and Z?

	Y	Z
Α	calcium	fluorine
В	carbon	sulphur
С	oxygen	hydrogen
D	sulphur	chlorine

18 Copper(II) sulphate crystals lose water when heated.

	CuSO ₄ .5H ₂ O	\rightarrow	CuSO ₄	+	5H ₂ O
<i>M</i> _r	250		160		

What is the mass of water lost on heating 5g of CuSO₄.5H₂O?

A 4.5g **B** 1.8g **C** 0.9g **D** 0.18g

19 Strontium hydroxide is an alkali.

Which statement about aqueous strontium hydroxide is correct?

- A The solution contains fewer hydrogen ions than hydroxide ions.
- **B** The solution has a pH less than 7.
- **C** The solution reacts with metal carbonates to form carbon dioxide.
- **D** The solution turns blue litmus red.
- **20** The names and electronic structures of the noble gases are shown.

helium	2
neon	2, 8
argon	2, 8, 8
krypton	2, 8, 18, 8
xenon	2, 8, 18, 18, 8

Why are the noble gases unreactive?

- **A** They all have an even number of electrons.
- **B** They all have a stable arrangement of electrons.
- **C** They all have eight electrons in the outer shell.
- **D** They all have two electrons in the first shell.
- **21** An excess of zinc powder is added to a solution containing a mixture of the ions Ca^{2+} , Cu^{2+} , Fe^{2+} and Mg^{2+} .

Which two metals are displaced from this solution?

- A calcium and copper
- **B** calcium and magnesium
- C copper and iron
- D magnesium and iron

22 Which drawing shows the arrangement of particles in a solid alloy?









Which two experiments show that air is needed for iron to rust?

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

	catalyst used	pressure/atm	temperature/°C
Α	iron	200	450
В	iron	450	200
С	nickel	200	450
D	nickel	450	200

24 Which conditions are used for the manufacture of ammonia by the Haber process?

25 Which compound is an alkene?

 $\label{eq:action} \textbf{A} \quad \textbf{CH}_4 \qquad \qquad \textbf{B} \quad \textbf{C}_2 \textbf{H}_6 \qquad \qquad \textbf{C} \quad \textbf{C}_3 \textbf{H}_8 \qquad \qquad \textbf{D} \quad \textbf{C}_4 \textbf{H}_8$

26 The structures of four organic compounds are shown.



27 The hydrocarbon $C_{11}H_{24}$ is present in crude oil.

The diagram shows reactions by which various products can be obtained from $C_{11}H_{24}$. In which step does oxidation take place?



10

28 A cell is being examined.

Which feature would enable you to identify it as a plant cell or an animal cell?

- A The cell contains a single large sap vacuole space.
- **B** The cell contains glucose and amino acids.
- **C** The cell contains stored fat.
- **D** The cell surface membrane is partially permeable.
- 29 The diagram shows a root hair cell and surrounding soil particles.



Osmosis occurs when regions of higher and lower concentration of water molecules are separated by a partially permeable membrane.

	higher concentration of water molecules	partially permeable membrane	lower concentration of water molecules
Α	1	2	4
в	1	3	4
С	4	2	1
D	4	3	1

On the diagram, what are these regions?

- **30** What are enzymes?
 - A fats which are secreted by glands in the digestive system
 - B proteins which are unaffected by temperature
 - **C** fats which have a characteristic molecular shape
 - **D** proteins which act as biological catalysts
- **31** The diagram shows a cross section of a leaf under the microscope.

Where is light energy converted into chemical energy?



32 After eating, the pH in the mouth decreases.

Which statement explains this decrease?

- A Bacteria release acids.
- B Enzymes in saliva release acids.
- C Salivary glands release acids.
- **D** Taste receptors release acids.
- 33 What causes wilting to occur in a plant?

	water loss	water uptake
Α	high	high
В	high	low
С	low	high
D	low	low

In which vessel is the blood pressure highest?



- 35 What are the products of anaerobic respiration in yeast?
 - A alcohol and carbon dioxide
 - **B** carbon dioxide and glucose
 - C glucose and oxygen
 - **D** oxygen and alcohol
- 36 Which cannot be an example of excretion?
 - A Carbon dioxide is breathed out from the lungs.
 - **B** Undigested food leaves the body through the anus.
 - C Urea leaves the body in urine.
 - **D** Water is removed through the kidneys.

37 A light of varying intensity was shone into a person's eye for 50 seconds.

The graph shows changes in pupil size as the light intensity was changed.



Which statement explains the change in pupil size?

- **A** The light slowly became brighter.
- **B** The light suddenly became brighter.
- **C** The light slowly became dimmer.
- **D** The light suddenly became dimmer.
- 38 What are the effects of the excessive consumption of alcohol?

	depressant	liver damage	quicker reaction time	
Α	1	X	\checkmark	key
в	✓	✓	x	✓ = effect occurs
С	x	x	\checkmark	x = effect does not occur
D	X	✓	x	



C 5

6

D

15

39 The diagram shows part of a food web.

40 Which structures protect the flower when it is a bud?

B 4

How many herbivores are shown?

A anthers

3

Α

- B carpels
- C petals
- **D** sepals

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	0	4	He	Helium 2	20	Ne	Neon 10	40	Ar	Argon 18	84	Кr	Krypton 36	131	Xe	Xenon 54		Rn	Radon 86				175	Lu	Lutetium 71		۲	Lawrencium 103
	١N				19	ш	Fluorine 9	35.5	Cl	Chlorine 17	80	Ŗ	Bromine 35	127	Ι	lodine 53		At	Astatine 85				173	٩۲	Ytterbium 70	2	No	Nobelium 102
	N				16	0	Oxygen 8	32	S	Sulphur 16	79	Se	Selenium 34	128	Te	Tellurium 52		Ро	Polonium 84				169	Tm	Thulium 69		Md	Mendelevium 101
	>				14	z	Nitrogen 7	31	٩	Phosphorus 15	75	As	Arsenic 33	122	Sb	Antimony 51	209	Bi	Bismuth 83				167	ц	Erbium 68		Fm	Fermium 100
	≥				12	ပ	Carbon 6	28	Si	Silicon 14	73	Ge	Germanium 32	119	Sn	Tin 50	207	Pb	Lead 82				165	Ч	Holmium 67	;	Es	Einsteinium 99
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					-						55	Mn	Manganese 25		Ъс	Technetium 43	186	Re	Rhenium 75				144	Nd	Neodymium 60	238	D	Uranium 92
											52	ບັ	Chromium 24	96	Mo	Molybdenum 42	184	8	Tungsten 74				141	Pr	Praseodymium 59		Ра	Protactinium 91
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											48	F	Titanium 22	91	Zr	Zirconium 40	178	Ħ	Hafnium 72							ic mass	loc	ic) number
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	–				7	:	Lithium 3	23	Na	Sodium 11	39	¥	Potassium 19	85	Rb	Rubidium 37	133	Cs	Caesium 55		Ľ	Francium 87	58-711		col -0e		(ey	 ,

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