Centre Number	Candidate Number	Name		
CA	AMBRIDGE INTER	NATIONAL EXAMINATIONS		
Intern	ational General Ce	rtificate of Secondary Educa	tion	_
COMBINED S	SCIENCE		1653/05	
Paper 5 Praction	cal Test	N/	w/ luna 200	2
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Candidates answe Additional Materia	er on the Question Pap Is: As listed in Instru	er. ctions to Supervisors	r 30 minutes	5
READ THESE INSTRUCT Write your Centre number Write in dark blue or black You may use a soft pencil	TIONS FIRST , candidate number an pen in the spaces pro for any diagrams, grap	d name on all the work you hand ir vided on the Question Paper. ohs or rough working.	1.	
The number of marks is gi Chemistry practical notes	ven in brackets [] at ti for this paper are printe	ne end of each question of part qu	estion.	
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- 1 This question is to show what is produced when food is burned in air. In some ways the process is similar to respiration in the cells of the body.
 - Set up the apparatus as shown in the diagram, Fig. 1.1(a).



- Fig. 1.1
- Take a small piece of toast and push it onto the tip of a mounted needle.
- Set fire to the toast by holding it in the flame of a Bunsen burner.
- When it is burning strongly hold it about two centimetres beneath the test-tube, as shown in Fig. 1.1(b).
- It must burn for fifteen seconds. If it goes out, light it again and repeat.
- After fifteen seconds, put the flame out by plunging the needle and burning toast into the beaker of cold water provided.
- Carefully put a bung in the test-tube,
- Place the test-tube in a test-tube rack.
- (a) (i) Feel the outside of the test-tube. What do you notice?
 -[1]
 - (ii) Look carefully at the inside surface of the test-tube. Describe what you can see.

.....[1]

(iii) Add about 3 cm depth of limewater to the test-tube. Replace the bung and shake. Record your observation and conclusion.

observation

conclusion[2]

[1]

(b) The toast contained starch. The body cannot make use of the starch until it is broken down to sugar by enzymes in our digestive system. You are provided with two solutions, **A** and **B**. One solution contains starch and the Test both solution **A** and **B** for protein, using the biuret test.

observation with solution B

observation with solution A

other contains protein.

(i)

-[1]
- Which solution contains protein? (ii)
- (c) If the protein solution you have identified is an enzyme it will react with starch, the other solution, to produce a sugar.

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- Mix together 1 cm depth of each of the solutions **A** and **B** in a test-tube.
- Place the test-tube in a test-tube rack and leave for five minutes. •
- Add an equal volume of Benedict's solution.
- Heat the tube in a hot water bath for five minutes.
- Describe the colour change that took place. (i)

.....[1] (ii) Which substance do you definitely know is present in the test-tube now?[1] (iii) Was the protein solution an enzyme?[1] (iv) Explain how you know this.[1]

- (a) With a small piece of plasticine, fix the pin **P** at right angles to the spring, as shown in Fig. 2.1. Hang the spring from the metal rod of a clamp.
 - . Attach the mass carrier to the spring.
 - Fix the metre rule vertically in the clamp close to the spring with its zero mark at the bottom.



Fig. 2.1

- Make sure that you have left enough space under the spring for it to stretch at least 30 cm when the masses are hung on it.
- (i) Read off the height, h_o, of the pointer on the metre rule. Record h_o in millimetres in the table Fig. 2.2.

Now add 50 g to the carrier and read off the new height, **h**, of the pointer. Record **h** in the table Fig. 2.2. Repeat by adding further 50 g masses until you have added a total of 250 g.

(ii) Complete the table, noting that you are required to convert each mass into a force, (1 kg is 10 N) and calculate the total increase in length of the spring each time.

total mass added/g	force / N	pointer reading h /mm	total increase in length (extension) = $\mathbf{h_o} - \mathbf{h}/mm$
0	0	h _o =	0

4

Fig. 2.2

(b) On the graph grid provided, plot a graph of the extension of the spring (vertical axis) against the force. Draw the best straight line through these points.



(d) Describe how you would find the mass of an object using the experiment already carried out. You need to state the measurements you would make and how the mass would be calculated.

 [2]

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- **3** You are going to investigate the potential difference produced when two different metals are in contact.
 - (a) Clean the pieces of metal with sandpaper to ensure good electrical contact.
 - Connect a wire from the negative terminal of the voltmeter to the strip of magnesium, using a crocodile clip.
 - Place the strip of magnesium under a circle of filter paper.
 - Add the very dilute acid to the filter paper using a dropping pipette. Add sufficient to make the whole piece of paper wet.
 - Connect a piece of wire from the positive terminal of the voltmeter to the zinc strip using a crocodile clip.
 - Press the piece of zinc down onto the wet filter paper above the magnesium strip. See Fig. 3.1.
 - Read the potential difference and record its value in the table, Fig 3.2. You should also note which metal is acting as the negative pole of the cell produced by the two metals.





pairs of metals	negative metal	potential difference/V
magnesium and zinc		
copper and magnesium		
copper and zinc		

Fig. 3.2

[4]

(b) Repeat the procedure with copper and magnesium, then copper and zinc. Use a fresh circle of filter paper each time.

(c)	From your results, state which of the three metals is the most negative. Explain your answer.	U
	[2]	
(d)	Place the metals in order of decreasing reactivity, the most reactive first.	
	[1]	
(e)	Imagine you are given a metal X together with copper, magnesium and zinc. Describe a method to place the four metals in order of decreasing reactivity, using the apparatus and results of your previous experiment.	
	[3]	

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CHEMISTRY PRACTICAL NOTES

Test for anions

anion	test	test result
carbonate (CO ₃ ²⁻)	add dilute acid	effervescence, carbon dioxide produced
chloride (Cl ⁻) [in solution]	acidify with dilute nitric acid, then add aqueous silver nitrate	white ppt.
nitrate (NO ₃ ⁻) [in solution]	add aqueous sodium hydroxide, then aluminium foil; warm carefully	ammonia produced
sulphate (SO ₄ ^{2–}) [in solution]	acidify, then add aqueous barium chloride <i>or</i> aqueous barium nitrate	white ppt.

Test for aqueous cations

cation	effect of aqueous sodium hydroxide	effect of aqueous ammonia
ammonium (NH4 ⁺)	ammonia produced on warming	_
copper(II) (Cu ²⁺)	light blue ppt., insoluble in excess	light blue ppt., soluble in excess, giving a dark blue solution
iron(II) (Fe ²⁺)	green ppt., insoluble in excess	green ppt., insoluble in excess
iron(III) (Fe ³⁺)	red-brown ppt., insoluble in excess	red-brown ppt., insoluble in excess
zinc (Zn ²⁺)	white ppt., soluble in excess, giving a colourless solution	white ppt., soluble in excess, giving a colourless solution

Test for gases

gas	test and test result
ammonia (NH ₃)	turns damp litmus paper blue
carbon dioxide (CO ₂)	turns lime water milky
chlorine (Cl ₂)	bleaches damp litmus paper
hydrogen (H ₂)	'pops' with a lighted splint
oxygen (O ₂)	relights a glowing splint