Coimisiún na Scrúduithe Stáit

State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2007

SCIENCE (Revised Syllabus)

HIGHER LEVEL

Marking Scheme

TABLE FOR ASSIGNING GRADES	
GRADE	**RANGE**
A	510 - 600
B	420 - 509
C	330 - 419
D	240 - 329
E	150 - 239
F	60 - 149
NG	0 - 59

General Points regarding the Marking Scheme for Junior Certificate Science

1. In many cases only key phrases are given in the marking schemes. These points contain the information and ideas that must appear in the candidate's answer in order to merit the assigned marks.

2. The descriptions, methods and definitions given in a marking scheme are not exhaustive and alternative valid answers are acceptable.

3. The detail required in any answer is determined by the context and the manner in which the question is asked and by the number of marks assigned to the answer in the examination paper. This may vary from year to year.

4. The bold text is often used to indicate the essential points required in the candidate's answer. A double solidus (//) separates points for which separate marks are allocated in a part of the question. Words, expressions or statements separated by a solidus (/) are alternatives which are equally acceptable for a particular point. A word or phrase in bold, given in brackets, is an acceptable alternative to the preceding word or phrase. Note, however, that words, expressions or phrases must be correctly used in context and not contradicted. Where there is evidence of incorrect use or contradiction, the marks may not be awarded.

5. In general, names and formulas of elements and compounds are equally acceptable except in cases where either the name or the formula is specifically asked for in the question. However, in some cases where the name is asked for, the formula may be accepted as an alternative. This is clarified within the scheme.

6. There is a deduction of one mark for each arithmetical slip made by a candidate in a calculation.

7. Cancelled &/or Repeated Answers

In the case of short-answer questions, if an answer is cancelled and a second answer given, the cancellation is accepted and marks are awarded for the uncancelled answer. If two answers are given and neither answer is cancelled, the first answer offered only is accepted and marked accordingly. If the only answer offered is cancelled, the cancelling is ignored and the answer marked as normal. However, in MCQ-type questions cancelling of an incorrect and correct answer applies.

For answers to "describe an investigation / an experiment", multiple attempts will be dealt with as follows:
If a candidate answers a question or part of a question once only and then cancels, the cancelling is ignored and the answer marked as normal. If a candidate answers a question or part of a question more than once and then cancels one attempt, the cancelling will be ignored and all the answers, whether cancelled or not, marked as normal. However, only the marks gained in respect to the highest scoring attempt will be counted. Points cannot be "mixed and matched from two attempts". The disallowed marks should be enclosed in square brackets.

8. Deduction of marks for omitted labelled diagrams

Assign marks in the usual way. Then use square brackets to deduct the marks.

9. Application of the marking scheme

Apply the marking scheme as agreed.
Assistant Examiners should enter marks in Examiner Column 1.
Column 2 to be used by Advising Examiners.
Disallowed marks should be placed in square brackets i.e. '[ ]'.

10. Transfer of marks

All marks should be transferred to the grid on the cover page of the examination answer-booklet.
Marks should be totalled, the bonus for answering through Irish applied where relevant.

11. Do not enter the grade for the examination in the grid on the front of the answerbook. Enter the grade on the top right hand of the answerbook.

Junior Certificate Examination

SCIENCE

Higher Level Paper

WRITTEN EXAMINATION PAPER

Three Sections: Biology, Chemistry and Physics, *all* questions to be answered by candidates.

Biology Question 1 (52 marks); Question 2 (39 marks); Question 3 (39 marks)
Chemistry Question 4 (52 marks);Question 5 (39 marks); Question 6 (39 marks)
Physics Question 7(52 marks); Question 8 (39 marks); Question 9 (39 marks)

COURSEWORK A

Count the number of mandatory biology investigations/experiments claimed on page 5 of the Coursework booklet and enter it in the Coursework A grid on the cover page.

Count the number of mandatory chemistry investigations/experiments claimed on page 6 of the Coursework booklet and enter it in the Coursework A grid on the cover page.

Count the number of mandatory physics investigations/experiments claimed on page 7 of the Coursework booklet and enter it in the Coursework A grid on the cover page.

Total the number of investigations / experiments claimed and award 2 marks per investigation / experiment to an amount not exceeding maximum 60 marks.

COURSEWORK B

Mark the SEC nominated investigations according to the agreed criteria. Enter the marks for each section in the Coursework B grid on the cover page of the coursework booklet.

or

Mark the candidate nominated investigation according to the agreed criteria. Enter the marks for each section in the Coursework B grid on the cover page of the coursework booklet.

Transfer of marks

Marks awarded to Coursework A and Coursework B should be transferred to the marking grid on the front of the examination paper.

SCIENCE (REVISED SYLLABUS) HIGHER LEVEL 2007
Summary of Marking Scheme

BIOLOGY

Question 1		(7 × 6 + 1 ×10)
Question 2	(a)	(3 × 3), (4 × 3)
	(b)	(3) (2 × 3), (3) (2 × 3)
Question 3	(a)	(2 × 3), (3 × 3)
	(b)	(3), (3), (3)
	(c)	(3), (3), (3), (6)

CHEMISTRY

Question 4		(7 × 6 + 1 ×10)
Question 5	(a)	(3), (3 × 3), (3), (3)
	(b)	(4 × 3)
	(c)	(2 × 3), (3)
Question 6	(a)	(3), (3), (3), (3), (2 × 3)
	(b)	(4 × 3), (3)
	(c)	(3), (3)

PHYSICS

Question 7		(7 × 6 + 1 ×10)
Question 8	(a)	(2 × 3), (3)
	(b)	(2 × 3), (2 × 3),
	(c)	(2 × 3), (2 × 3), (2 × 3)
Question 9	(a)	(3), (3), (3), (3)
	(b)	(3), (3), (6, 3)
	(c)	(4 × 3)

Biology (130 MARKS)

Answer <u>each</u> of the questions 1, 2 and 3.

<u>Question 1. (52 Marks) *All* Items, (a), (b), (c), etc. (7 × 6 + 1 × 10marks)</u>

(a)	**any *two* from**: water/ salt/ urea…	(2 × 3)	**[6]**
(b)	**motor function, any *one* from**: carry messages from the brain(spinal cord) (CNS)/ to muscles (effectors) (glands) **sensory function, any *one* from**: carry messages to the brain(spinal cord) (CNS)/ from sensory organs (sensors) (ear) (eye) (nose) (skin) tongue)	(3) (3)	**[6]**
(c)	fused/ fixed/ immovable/ no movement	(3) (3)	**[6]**
(d)	A: lens **any *one* from**: controls (changes) (alters) the shape (thickness) of the lens/ focuses	(3) (3)	**[6]**
(e)	**any *one* from**: nucleus/ chromosomes/ genes/ mitochondria/ plasitds protein	(3) (3)	**[6]**
(f)	put tube **B** over the small animal suck tube **A**	(3) (3)	**[6]**
(g)	**any *two* from production of**: bread/ beer (lager) (stout)/ miso/ vinegar/ soy sauce/ wine/yoghurt/ antibiotics (penicillin)/ hormones (insulin)/ vaccines/ interferon/ biological detergents/ pesticides/ GM (genetically modified organisms)/ bio-fuels (methane)…/ spirits (vodka)…	(2 × 3)	**[6]**
(h)	Fat **test**: rub food onto paper translucent (greasy) spot **note**: if a wrong food type is given by the candidate e.g. ‘starch’ then they lose the first 4 marks. If they then give the correct test for the food that they have named e.g. ‘iodine’ and ‘blue-black’ award the (2 × 3)	(4) (3) (3)	**[10]**

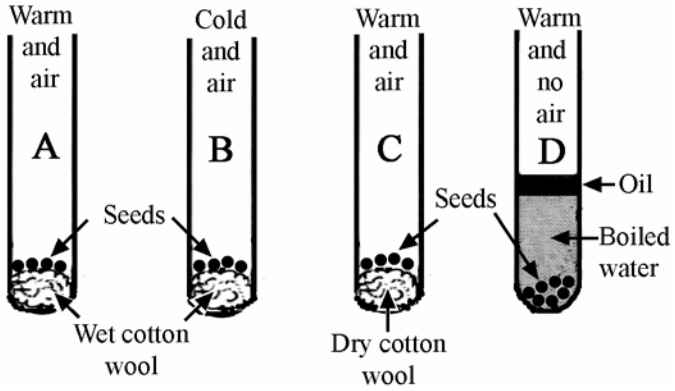
Question 2. (39 marks) *All* items, (a), (b) and (c).

(a) (*i*) List

any *three* from: water (moisture)/ oxygen (air)/ suitable temperature (warm) (heat)/ period of dormancy over/ light (3 × 3) **[9]**

(*ii*) Describe

assume that seed dormancy is over, the investigation deals with environmental factors (conditions) only
A has water, oxygen (air) and warm (15-20^{0}C)
B has water, oxygen (air) and cold (4^{0}C)
C has **no water**, oxygen (air) and warm (15-20^{0}C)
D has water, **no oxygen (air)** and warm (15-20^{0}C)
note 'cold' alone gets no marks, refrigerate/ 4^{0}C is needed



(3)

show or state (3)
A is required in all answers
only seeds in **A** germinate
any *two* from B, **C**, or **D** can act as a **suitable control** (2 × 3) **[12]**
(matched) for the ***two* conditions** selected by the candidate.

note only *two* conditions are investigated. In their answer the candidate may **not list** all three e.g. if water and air are selected and **A**, **C** and **D** are given and 'warm' is not given award the marks.
if 'light' is a selected condition then a **way** of keeping seeds light-free, from the start, is required in the answer
[no diagram deduct 3 marks]

(b) (*i*) Give

any *one* from: produces bile / helps digest (breakdown) (emulsify) fats or a named fat (3) **[3]**

(*ii*) Identify

enzyme: amylase (3)
substrate: starch (3) **[6]**

(*iii*) Give

any *one* from: absorption/ food (nutrients) into the blood/ transports (3) **[3]**

(*iv*) Describe

burn a peanut (crisp) (cracker) (3)
temperature of water rises/ thermometer shows increase (3) **[6]**
accept equivalent experiments

Question 3. (39 marks) *All* items, (a) and (b).

(a)	(*i*) Complete	**missing reactant**: oxygen (O_2) **missing product**: carbon dioxide (CO_2)	(3) (3)	**[6]**
	(*ii*) State	**test for CO_2**: CO_2 (carbon dioxide) lime water goes milky **or** **test for water**: cobalt chloride/ copper sulphate add water turns pink/ turns blue **note**: colour must be matched with reagent **note**: if the candidate gives oxygen, O_2, as a **product** in (*i*) they get no marks for it in (*i*), **allow** in (*ii*) (3) for 'relights' and (3) for 'glowing splint' i.e. in this case test for O_2 can get (2 × 3)	(3) (3) (3) **or** (3) (3) (3)	**[9]**
(b)	Name	oxygen (O_2)	(3)	**[3]**
	Name	carbon dioxide (CO_2)	(3)	**[3]**
	How?	brighter (more) light/ increase (more) CO_2	(3)	**[3]**
(c)	(*i*) Explain	burning releases carbon dioxide (CO_2) **or** **any *one* from**: deforestation results in less carbon dioxide (CO_2) being used/ less photosynthesis/ burning forests releases CO_2	(3) **or** (3)	**[3]**
	(*ii*) Suggest	**any *one* from**: acidification of rivers (lakes) (seas) / melting of polar ice (glaciers)/ rise in sea levels / drought/ greenhouse effect/ disruption of aquatic food chains/ climate change (hotter) (colder) (more or less rain) (more or less wind)/ changes in ocean currents/ extinction of species/ global warming… **note**: 'damages the ozone layer' gets no marks	(3)	**[3]**
	(*iii*) Suggest	**any *one* from**: carbon dioxide (CO_2) is taken in by plants/ used in photosynthesis/ more leaves/ less fuel is burnt for heating…	(3)	**[3]**
	(*iv*) How?	**Allow any *one* from**: plant more trees (reforestation)/ by increasing photosynthesis/ by increasing photosynthesis/ burn less fuel/ turn down thermostats/ better heat insulation of houses (correct example)/ heat pump/ bio-fuel/ solar panels… **note** allow 6 marks for 'burn less fuel only it has not appeared in (*iii*) above	(6)	**[6]**

Chemistry (130 MARKS)

Answer <u>each</u> of the questions 4, 5 and 6.

<u>Question 4. (52 marks) *All* items, (a), (b), (c), etc. (7 × 6 + 1 × 10marks)</u>

(a) two dots (**X**s) in inner circle and eight dots (**X**s) in 'middle' circle (3)
one dot (**X**) in outer circle (3) **[6]**

(b) oil (3)
any *one* from: will not rot (decay)/ bacteria (fungi) (microbes) (micro-organisms) cannot break them down (3) **[6]**
accept: can not be decomposed (broken down) for 3 marks

(c) graduated (measuring) cylinder (3)
any *one* from: burette/ pipette/ gas (graduated) syringe (3) **[6]**

(d) **any *two* from**: soft (can be cut with a knife)/ low density(float on water)/ shiny (lustrous) when cut/ tarnish(form oxide) (reacts) with air/ burn in air/ coloured flames/ react with water/ hydrogen produced with water/ hydroxides formed with water/ silver' (white metals)/ very reactive/ one electron in outer orbit… (2 × 3) **[6]**

note general properties of most metals like electrical and thermal conductivity, ductility, malleability, etc get no marks, specific properties of **alkali** metals are required.

(e) shared (3)
electrons (3) **[6]**

(f) **any *one* from**: alum/ copper sulphate/ salt/ sugar/ silicon/ iodine/ diamond… (3)
any *one* from: crystalline solids have definite (geometric) shapes/ particles in crystals are in regular(geometric) order/ texture e.g. salt and sugar 'feel' different to flour/ crystals affect light/ shiny / sparkle… (3) **[6]**

(g) **any *one* from**: $Ca(OH)_2$/ $CaCO_3$/ NaOH/ Na_2CO_3/ $NaHCO_3$/ NH_3…
any *one* from: sodium hydroxide (caustic soda)/ sodium carbonate (washing soda) sodium hydrogen (bi) carbonate (bread soda)/ ammonia… (3)
accept any *one* from: the named household substances: toothpaste/ oven cleaner/ antacid (named antacid)/ baking powder… (3) **[6]**
do not accept: bleach/ shampoo
note: accept names **only** for the second 3 marks

(h) **A** condenser (3)
Y (3)
Water/ H_2O (2)
salt/ sodium chloride/ NaCl… (2) **[10]**

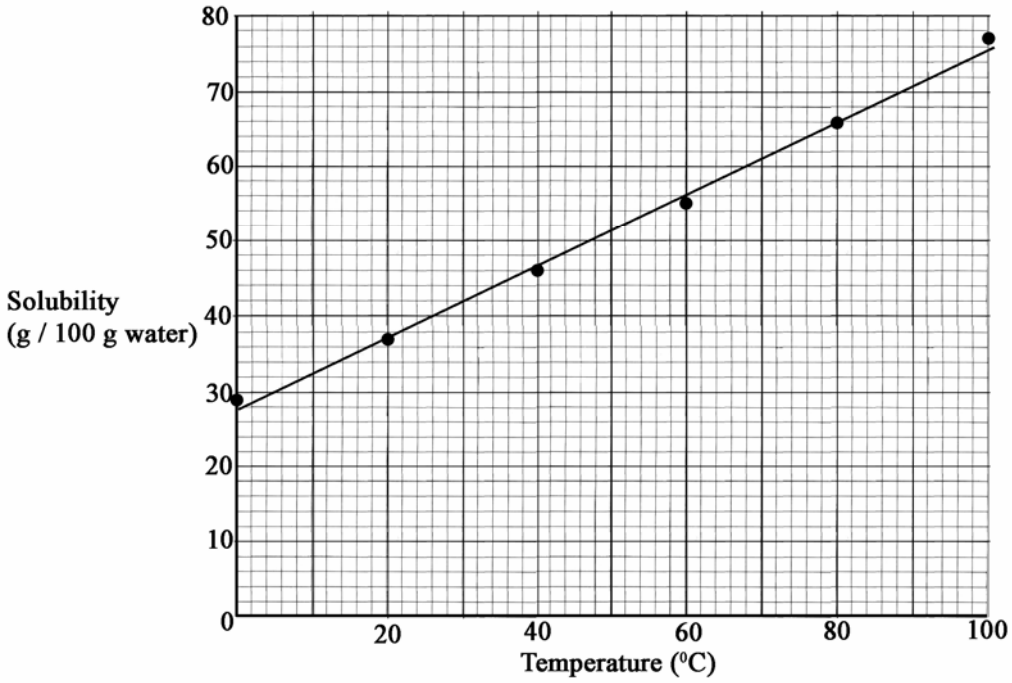
Question 5. (39 Marks) *All* items, (a), (b), (c), etc.

(a) Distinguish

any *one* from: **concentrated** a lot in a small amount of solvent (water)/ **dilute** a small amount in a lot of solvent (water) (3) **[3]**

allow 3 marks for concentrated can be made dilute by adding solvent (water)

Plot



suitable scales drawn on both axes (3)
points plotted (a minimum of four points) (3)
line drawn (it is actually a curve, so accept a curve or a straight line) (3) **[9]**

Use

61 **accept** 58 to 64 i.e. +/- 3 (3) **[3]**

What?

accept solubility is proportional to temperature for 3 marks solubility increases with temperature (3) **[3]**

(b) Explain

element: allow (3) for 'only one type of atom' **or** 'can't be made simpler'

allow (6) for all atoms have the same atomic number (nuclear charge)

element: cannot be broken down into simpler substances (3)

compound: two or more elements chemically combined (3)

(3) **[12]**

(c) Describe

any *one* from: pH (universal) indicator/ pH meter (probe) (3)

any *one* from: match colour/ read pH (3) **[6]**

Name

any *one* from: battery acid/ sulphuric acid/ vinegar/ lemon (orange) juice/ sour milk/ carbonated drinks (named carbonated drink)… (3) **[3]**

Question 6. (39 marks) *All* items, (a), (b) and (c).

(a)	Give	HCl, **accept** formulae(s) of other acids	(3)	**[3]**
	Give	calcium carbonate **accept** any named carbonate **or** bi(hydrogen) carbonate	(3)	**[3]**
	What?	denser (heavier) than air	(3)	**[3]**
	What?	both red (pink)/ blue to red (pink)	(3)	**[3]**
	Give	**any *two* from**: fire extinguishers/ fizzy drinks/ photosynthesis/ 'dry ice'/ 'stage effects'…	(2 × 3)	**[6]**
(b)	(*i*) Describe	**test**: add soap	(3)	
		shake	(3)	
		result: **any *one* from**: water in flask **A** (hard water) does not form a lather easily with soap / forms a scum with soap	(3)	
		any *one* from: flask **B** contains water that forms a lather easily with soap/ does not form a scum with soap/ contains soft water	(3)	**[12]**
	(*ii*) What?	**any *one* from**: compounds of calcium (magnesium)/ calcium **or** magnesium ions (salts)/ formulae(s) **or** names of compounds of calcium and magnesium, **except carbonates**, e.g. $CaCl_2$, $Ca(HCO_3)_2$, calcium chloride, calcium hydrogen carbonate…/ lime	(3)	**[3]**
(c)	(*i*) Name	**any *one* from**: screening/ settling/ filtration/ UV 'light'/ chlorination/ fluoridation/ pH adjustment/ softening/ distillation…	(3)	**[3]**
	(*ii*) Give	**any *one* from (matched)**: **Screening**: takes out large solids **settling**: solids sink **filtration**: solids are removed **UV** (ultraviolet) irradiation: stops certain dangerous microbes multiplying **chlorination**: to kill bacteria (microbes) **fluoridation**: help prevent tooth decay **pH adjustment**: stop damage to metal pipes **softening**: removing dissolved calcium/ magnesium **distillation**: removing dissolved solids	(3)	**[3]**

Physics (130 MARKS)

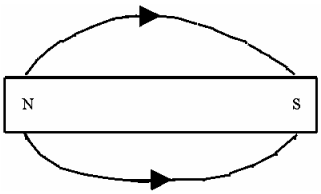
Answer <u>each</u> of the questions 7, 8 and 9.

<u>Question 7. (52 marks) *All* items, (a), (b), (c), etc. (7 × 6 + 1 × 10marks)</u>

(a)	(*i*) heat the ball, it does not pass through the ring	(3)	
	(*ii*) let the ball cool, now passes through the ring	(3)	**[6]**
(b)	(*i*) ice is less dense than water	(3)	
	(*ii*) ice is more dense than ethanol	(3)	**[6]**
(c)	bulb **A** lights	(3)	
	the diode with **A** is in forward bias (allows current to flow)		
	(+ end of diode connected to + pole of battery)	(3)	**[6]**
	note allow 3 marks for a correct reason for why **B** does not light if a correct reason for why **A** does light is not given		
(d)	**magnetic effect any *one* from**: electromagnets/ door bells/ remote opening of doors/central locking in cars/ phones/ speakers/ electric motors/ any named device incorporating an electric motor/ read (write) heads on audio (video) recorders computer drives/ remote switching e.g. starter motor in car electrical meters…	(3)	
	chemical effect any *one* from: electroplating/ chromium plating/ silver plating/cold galvanising/ refining of copper/ refining of aluminium/ production of sodium hydroxide/ production of hydrogen/ charging a battery…	(3)	**[6]**
	accept 'electrolysis' for 3 marks		
(e)	light moves faster than sound	(6)	**[6]**
(f)	**advantage any *one* from**: no 'greenhouse gas 'emissions/ no carbon dioxide (CO_2) emissions/ supply of nuclear fuel for many centuries/ can produce large amounts of energy/ cleaner supply of electricity…	(3)	
	disadvantage any *one* from: devastation if a reactor erupts/ very long term storage of wastes/ wastes are radioactive(dangerous)/ mining for nuclear fuel damages the environment / transport of nuclear fuel is hazardous/ terrorist threat reprocessing nuclear fuel is hazardous (can damage the environment)/…	(3)	**[6]**
(g)	water is a poor conductor of heat	(3)	
	any *one* from: hot water rises/ water is heated by convection(current)	(3)	**[6]**
	note 'heat rises' alone gets no marks		
(h)	**weather conditions**:		
	any *two* from: cloudy/ windy/ rain…	(2 ×3)	
	explanation:		
	any *one* from: air rises/ water vapour condenses (cools)/ air moves in	(4)	**[10]**

Question 8. (39 marks) *All* items, (a), (b), (c), etc.

(a) Draw



two magnetic field lines shown, **one on each side** of the bar magnet. (2 × 3) **[6]**

[if direction is not given *or* given incorrectly for a magnetic field line award no marks for that 'line']

What? poles/ north and south (3) **[3]**

(b) Calculate

note
(*i*) if no calculation is performed allow 3 marks for 'work = force × distance', award no marks for units in this case.
(*ii*) allow 2 marks for (8 × 20) or (8000 × 20), if the units are matched allow the 3 marks for the unit
(*iii*) unit alone gets no marks

160 000 (3)
J (Nm) (3)
or **or**
160 (3)
kJ (kNm) (3) **[6]**

Identify

any *one* from: kinetic to heat/ kinetic to sound/ kinetic to electrical/ kinetic to chemical/ kinetic to potential
note: the last three are included to allow for 'hybrid' cars (2 × 3) **[6]**
[allow 3 marks for a correctly named energy provided it is on the correct side of 'to' or of an arrow]

(c) Define

accept turning effect **or** turning power for 3 marks

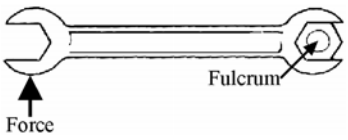
force (weight) multiplied by its distance from the fulcrum (3) (3) **[6]**

Calculate

$30 \times \mathbf{F} = 40 \times 3$ (3)
$\mathbf{F} = 4$ N ('N' not required) (3) **[6]**
note (*i*) allow 5 marks for (40 × 3)/30 if it is the only statement
(*ii*) '4' alone merits 6 marks

Give

e.g. spanner and nut
accept **any** correct **everyday** example of a lever



fulcrum shown correctly (3)
one force shown correctly (3) **[6]**
[no diagram deduct 3 marks]

note: if fulcrum **and** force are not shown in the diagram allow (3) for a correct example of an application of a lever shown

note if no diagram is given allow 3 marks for **any *one* from**: correct named application e.g. 'door'/ correct fulcrum named e.g. 'hinge'/ correct position of a force e.g. 'handle'

Question 9. (39 marks) *All* items, (a) and (b).

(a) (*i*) What? refraction (3) **[3]**

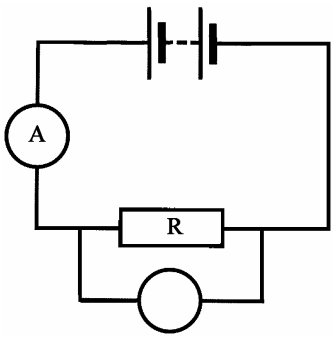
(*ii*) Pick **R** (3) **[3]**

(*iii*) Give **any *one* from**: lenses/ spectacles/ magnifying glass/ microscope/ binoculars/ telescopes/ camera lenses/ prisms/ projectors/ dispersion (rainbow) (spectrum)/ diascope/ endoscope/ periscope/… (3) **[3]**

(*iv*) Name **any *one* from**: reflection (bouncing off) (mirror)/ gravity (3) **[3]**

(b) What? current/ Amperes (Amps) (3) **[3]**

Enter



A correctly shown in series with **R** and the battery (3) **[3]**

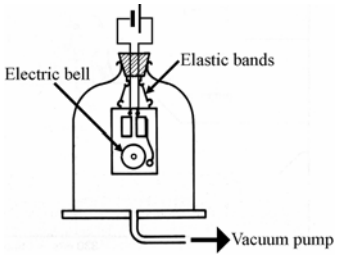
Use 12, **accept** 11.5 to 12.5 i.e. +/- 0.5 (6)

Ω **or** Ohms (3) **[9]**

allow 3 any correct ratio from the graph e.g. $\frac{1.2}{0.1}$ **or** $\frac{1.8}{0.15}$ etc

note if an incorrect ratio is given but it is used correctly in a calculation allow 3 marks e.g. $\frac{6}{5}$ = 1.2

(c) Describe



show or state

battery/ cell/ source of electricity (3)

bell in jar (container) (3)

vacuum pump/ air removed (3)

bell is less loud (can't be heard) (3) **[12]**

[no diagram deduct 3 marks]

[if the candidate does not score 12 marks for the above but has 'elastic bands'/ sound insulation between bell and container award 3marks]

accept equivalent experiments, look four equivalent points

acceptable sources of sound include: mobile phone, alarm clock, kitchen timer. Look for an equivalent point e.g. 'dial' for the phone for the first 3 marks

PHYSICS – Marking Criteria for Coursework B

			Guide to mark assignment	
Section	**Aims**	**Total Mark**	Investigate the relationship between the length of a metallic conductor and its resistance	**H.L.**
Introduction	Clear statement of the problem/topic to be investigated, background research undertaken in preparation for the investigation: people, books, websites, etc. as sources of relevant information.	5	**Statement / identification of problem / topic to be investigated:** **Research:** Any reference to book / web / person consulted etc.	(2) (3)
Preparation and planning	Identification of variables and controls as required	20	**Variables / Controls:** Identify any ***four*** variables and/or indicate how some of these need to be controlled or held fixed: Material of the wire / Cross-sectional area (thickness) / Length / Temperature / Resistance / Extended wire but not stretched / Same multimeter (leads)	(3 + 3 + 2 + 2)
	List of equipment needed for the investigation		**Equipment needed:** Identify any ***three*** pieces of equipment used: wire / metre stick / ohm meter (multimeter) / thermometer / voltmeter / ammeter / metre bridge / wheatstone bridge / leads / crocodile clips / wire cutters / Rheostat	(1 + 2 + 2)
	List of tasks to be carried out during the investigation		List of tasks: **Identify any *four* tasks carried out in investigation**: measuring (cutting) length of wire / measuring resistance / varying length / recording resistance and length in a table calculations / graphing	(2 + 1 + 1 + 1)

Procedure	Procedure, apparatus, safety, data collection/observations ▪ Safety precautions required for this investigation ▪ Procedures followed in the investigation ▪ Recorded data/observations	20	**Safety:** Identify any ***two*** specific safety precautions followed in conducting the investigation **Procedure:** State <u>or</u> Show Identify any ***five*** steps taken in conducting investigation: measure wire / attach ohm meter (ammeter & voltmeter) / take reading / vary length and measure again / how to keep variable such as cross-section or temperature fixed / record results / repeat to verify / make metre bridge / measure resistance of cables (probes) **Recorded Data / Observations:** Identify any ***two*** points related to method used: length of wire // resistance of wire	(2 + 3) (5 × 2) (3 + 2)
Analysis & Conclusions	Analysis ▪ Calculations/data analysis ▪ Conclusion(s) and evaluation of results(s)	20	**Calculations / Data analysis:** ***One*** relevant comment analysing data **or** calculation **or** graph Poor manipulation of data **OR** Limited manipulation of data **OR** Good manipulation of data **Conclusion:** ***One*** relevant conclusion drawn **or** evaluation of results obtained Poor treatment **OR** Limited treatment **OR** Good treatment	 (4) (7) (10) (4) (7) (10)
Comment	Comments (e.g. refinements, extensions, sources of error etc.)	10	***One*** comments on **refinements / extensions / sources of error**: Reliability of data / how process could be improved / sources of error / possible reason for unexpected result / possible extension of the investigation Poor comprehension **OR** Limited comprehension **OR** Good comprehension	 (4) (7) (10)

CHEMISTRY – Marking Criteria for Coursework B

			Guide to mark assignment	
Section	**Aims**	**Total Mark**	Investigate how the conc. of a H_2O_2 solution affects the speed at which it decomposes to produce oxygen gas	**H.L.**
Introduction	Clear statement of the problem/topic to be investigated, background research undertaken in preparation for the investigation: people, books, websites, etc. as sources of relevant information.	5	**Statement / identification of problem / topic to be investigated:** **Research:** Any reference to book / web / person consulted etc	(2) (3)
Preparation and planning	Identification of variables and controls as required	20	**Variables / Controls :** Identify any ***four*** variables and/or how some of these can controlled or held fixed: concentration of peroxide / volume of peroxide solution / amount of catalyst / particulate size of catalyst / activity of catalyst / temperature / rate of reaction (volume over time)	(3 + 3 + 2 + 2)
	List of equipment needed for the investigation		**Equipment needed:** Identify any ***three*** pieces of equipment used: buchner flask (reaction flask) and delivery tube / stopper / bee-hive shelf / graduated cylinder / trough of water / gas syringe / water bath / H_2O_2 solution / MnO_2 (celery) / Same cayalyst / thermometer / washing up liquid	(1 + 2 + 2)
	List of tasks to be carried out during the investigation		List of tasks: **Identify any *four* tasks carried out in investigation**: vary concentration / weigh catalyst / measuring rates / prepare catalyst in suitable manner / calculation / record results / graph	(2 + 1 + 1 + 1)

Procedure	Procedure, apparatus, safety, data collection/observations ▪ Safety precautions required for this investigation ▪ Procedures followed in the investigation ▪ Recorded data/observations	20	**Safety:** Identify any ***two*** specific safety precautions followed in conducting the investigation **Procedure:** State <u>or</u> Show Identify any ***five*** steps taken in conducting investigation: how to create stock solutions (use different know concentrations) / viable apparatus* / how to start reaction / how to measure rate / recording of data / repeating for different concs. / preparation of catalyst / ensuring uniformity of catalyst activity* * compulsory points ** Could do one rate curve and take tangents - adapt scheme accordingly **Recorded Data / Observations:** Identify any ***two*** points related to method used: table of data / presented in some way from which comparison could be drawn (graph / bar chart)	(2 + 3) (5 × 2) (3 + 2)
Analysis & Conclusions	Analysis ▪ Calculations/data analysis ▪ Conclusion(s) and evaluation of results(s)	20	**Calculations / Data analysis:** ***One*** relevant comment analysing data **or** calculation **or** graph Poor manipulation of data **OR** Limited manipulation of data **OR** Good manipulation of data **Conclusion:** ***One*** relevant conclusion drawn **or** evaluation of results obtained Poor manipulation of data **OR** Limited manipulation of data **OR** Good manipulation of data	 (4) (7) (10) (4) (7) (10)
Comment	Comments (e.g. refinements, extensions, sources of error etc.)	10	***One*** comments on **refinements / extensions / sources of error** e.g. Reliability of data / how process could be improved / sources of error / possible reason for unexpected result / possible extension of the investigation Poor comprehension **OR** Limited comprehension **OR** Good comprehension	 (4) (7) (10)

BIOLOGY – Marking Criteria for Coursework B

			Guide to mark assignment	
Section	**Aims**	**Total Mark**	Quantitative survey of the plant species in a local habitat	**H.L.**
Introduction	Clear statement of the problem/topic to be investigated, background research undertaken in preparation for the investigation: people, books, websites, etc. as sources of relevant information.	5	**Statement / identification of problem / topic to be investigated:** **Research:** Any reference to book / web / person consulted etc.	(2) (3)
Preparation and planning	Identification of variables and controls as required	20	**Variables / Controls:** Investigation doesn't involve normal variables/controls // ***or*** Identify any ***one*** factors which contributed to a kept fair: quadrat size / habitat / distance between transect intervals / randomness / on one visit	(5)
	List of equipment needed for the investigation		**Equipment needed:** Identify any ***three*** pieces of equipment used: quadrats / transect / equipment used to measure area / key / notepad (clipboard) / something to throw (for randomness)	(1 + 2 + 3)
	List of tasks to be carried out during the investigation		List of tasks: **Identify any** *four* **tasks carried out in investigation**: choose a habitat / throw pen (quadrat) randomly (do quadrat study) / set out transect (do transect study) / area measurement / identify / count / note (record data) / repeat what's to be measured / calculation / graph	(3 + 2 + 2 + 2)

Procedure	Procedure, apparatus, safety, data collection/observations
	▪ Safety precautions required for this investigation
	▪ Procedures followed in the investigation
	▪ Recorded data/observations
		20	**Safety:** Identify any ***two*** specific safety precautions followed in conducting the investigation
			
			Procedure: State <u>or</u> Show
			Identify any ***five*** steps taken in conducting investigation:
			mark out (measure) area (habitat) /
			throw randomly /
			set out quadrat /
			stations (knots /
			set out transect /
			identify (use key) /
			count (estimate, presence or absence) /
			note (record data) /
			repeat
			
			Recorded Data / Observations: Identify any ***two*** points related to method used:
			range of species (min. 4 species) //
			pattern of population //
			[Table presentation likely]
				(2 + 3)
				
				(5 × 2)
				
				(3 + 2)

Analysis & Conclusions	Analysis ▪ Calculations/data analysis ▪ Conclusion(s) and evaluation of results(s)	20	**Calculations / Data analysis:** ***One*** relevant comment analysing data **or** calculation **or** graph Poor manipulation of data **OR** Limited manipulation of data **OR** Good manipulation of data **Conclusion:** ***One*** relevant conclusion drawn **or** evaluation of results obtained Poor treatment **OR** Limited treatment **OR** Good treatment	 (4) (7) (10) (4) (7) (10)
Comment	Comments (e.g. refinements, extensions, sources of error etc.)	10	***One*** comments on **refinements / extensions / sources of error**: reliability of data / how process could be improved / sources of error / possible reason for unexpected result / possible extension of investigation Poor comprehension **OR** Limited comprehension **OR** Good comprehension	 (4) (7) (10)

OWN INVESTIGATION – Marking Criteria for Coursework B

Guide to mark assignment				
Section	**Aims**		**Total Mark**	**H.L.**
Introduction	Clear statement of the problem/topic to be investigated, background research undertaken in preparation for the investigation: people, books, websites, etc. as sources of relevant information.	10	**Statement / identification of problem / hypothesis statement / topic to be investigated:** **Research:** Any ***two*** references to book / web / person consulted etc	(6) (2 × 2)
Preparation and planning	Identification of variables and controls List of equipment needed for the investigation List of tasks to be carried out during the investigation	40	**Variables & Controls*:** Identify any ***four*** variables / controls: **Equipment needed:** Identify any ***five*** pieces of equipment used **List of tasks:** Identify any ***four*** tasks carried out in investigation If variables/controls not relevant to the type of investigation undertaken allow 10 marks for stating so and then readjust equipment to (3 + 3 + 4 + 5) and tasks to (3 + 3 + 4 + 5)	(4 × 5) (5 × 2) (2 + 2 + 3 + 3)
Procedure	Procedure, apparatus, safety, data collection/observations ▪ Safety precautions required for this investigation ▪ Procedures followed in the investigation ▪ Recorded data/observations	40	**Safety:** Identify any ***two*** safety precaution followed in conducting the investigation **Procedure:** State or Show Identify any ***eight*** steps taken in conducting investigation **Recorded Data / Observations:** Identify any ***two*** points related to method used	(2 × 3) (8 × 3) (2 × 5)
Analysis & Conclusions	Analysis ▪ Calculations/data analysis ▪ Conclusion(s) and evaluation of results(s)	40	**Calculations / Data analysis:** ***Two*** relevant comment analysing data **or** calculation **or** graph Limited manipulation of data **OR** Good manipulation of data **Conclusion:** ***Two*** relevant conclusion drawn **or** evaluation of results obtained Limited treatment **OR** Good treatment	(4) (7) (10) } × 2 (4) (7) (10) } × 2
Comment	Comments (e.g. refinements, extensions, sources of error etc.)	20	***Three*** comments on **refinements / extensions / sources of error** e.g. What was learnt** / reliability of data / how process could be improved / sources of error / possible reason for unexpected result	(5 + 5 + 10)
** Other than the conclusions already stated				