Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE 2008

MARKING SCHEME

SCIENCE (1989 SYLLABUS)

ORDINARY LEVEL

GUIDELINES TO EXAMINERS ON
CANCELLED, REPEATED OR EXCESS ANSWERS

CANCELLED ANSWERS

ALL SECTIONS If an answer is cancelled and a second answer given you should accept the cancellation and award marks for the uncancelled answer. If neither answer is cancelled then accept the first answer offered only and mark accordingly. If the only answer offered is cancelled ignore the cancelling and mark as normal.

For answers to "describe an experiment" in SECTION B, C, D and E multiple attempts should be dealt with as follows:
If candidates answer a question or part of a question only once and then cancel, you should ignore the cancelling and mark in the usual way.
If candidates answer a question or part of a question more than once and then cancel one attempt, you should ignore the cancelling and mark all the answers whether cancelled or not, however count only the marks gained in respect to the highest scoring answer. The disallowed marks should be enclosed in square brackets.

EXCESS ANSWERS

SECTION A Mark all parts but count only the marks for the twelve highest scoring parts. Disallowed marks should be enclosed in square brackets.

SECTION B, C D,AND E Mark all questions but count only the marks awarded to the two highest scoring question in each section. Disallowed marks should be enclosed in square brackets.

Care should also be taken with options in Q.13 (Materials Science).

When Sections B,C,D, and E are marked care must be taken to include ONLY the THREE highest scoring sections in the total

DEDUCTION OF MARKS FOR OMITTED DIAGRAM

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

Junior Certificate Examination

SCIENCE

Ordinary Level Paper

Structure

Five sections A, B, C, D, E.

Section A:		1 question 15 parts in each question (attempt any 12 parts)
Section B:	Physics	3 questions (attempt any 2 questions)
Section C:	Chemistry	3 questions (attempt any 2 questions)
Section D:	Biology	3 questions (attempt any 2 questions)
Section E:	Applied Sc.	6 questions (attempt any 2 questions)

Requirements

Without Local Studies:	Section A + any 3 other sections
With Local Studies:	Section A + any 2 other sections

Grades

Grade	Marks	
	Without LS	***With LS***
A	306 - 360	245 - 288
B	252 - 305	202 - 244
C	198 - 251	158 - 201
D	144 - 197	115 - 157
E	90 - 143	72 - 114
F	36 - 89	28 - 71
NG	0 - 35	0 - 27

Summary of Marking Scheme

SECTION A: CORE (144 MARKS)

Question 1 Answer any 12 parts (a), (b), (c), etc.

(a), (b), (c) etc. 4×3

ANY THREE SECTIONS

SECTION B: PHYSICS (72 MARKS)

Answer any TWO questions.

Question 2

(a), (b) & (c), 4×3

Question 3

(a), (b) & (c), 4×3

Question 4

(a), (b) & (c), 4×3

SECTION C: CHEMISTRY (72 MARKS)

Answer any TWO questions.

Question 5

(a), (b) & (c), 4×3

Question 6

(a), (b) & (c), 4×3

Question 7

(a) & (b) 4×3; (c), $2 \times 3 + 6$

SECTION C: BIOLOGY (72 MARKS)

Answer any TWO questions.

Question 8

(a), (b) & (c), 4×3

Question 9

(a), (b) & (c), 4×3

Question 10

(a), (b) & (c), 4×3

SECTION E: APPLIED SCIENCE (72 MARKS)

Answer any TWO questions.

Question 11

(a), (b) & (c), 4×3

Question 12

(a), 4×3; (b) & (c), 4×3

Question 13

(a), 4×3; (b), $2 \times 3 + 6$; (c), 4×3

Question 14

(a), (b) & (c), 4×3

Question 15

(a), (b) & (c), 4×3

Question 16

(a), (b) & (c), 4×3

SECTION A (144 marks)

ANY TWELVE PARTS (a), (b), (c), etc.

Q1	(a)	Measuring volume (liquids)	(3)	
		Support/hold/ over bunsen	(3)	
		Hold hot objects	(3)	
		Hold liquids/ titration	(3)	**[12]**
	(b)	**Any two of:** Wind / wave / solar / tidal / biomass (biofuel) (named biofuel)/ geothermal/ hydro-	(2 × 3)	
		Any two of: Coal / oil / peat / gas / nuclear	(2 × 3)	**[12]**
	(c)	Temperature/ hotness/ how hot or cold	(3)	
		Mercury / Spirit/ alcohol	(3)	
		100	(3)	
		0	(3)	**[12]**
	(d)	Litre	(3)	
		km	(3)	
		mm	(3)	
		cm^2	(3)	**[12]**
	(e)	Pluto	(3)	
		Mercury	(3)	
		365days/ 1year	(3)	
		Unsuitable atmosphere/ no oxygen /no water/ too cold / too hot/ low light	(3)	**[12]**
	(f)	Mixture	(6)	
		Element	(3)	
		Compound	(3)	**[12]**
		(First correct gets 6 marks)		
	(g)	Heat/ air (oxygen)	(2x3)	
		Carbon dioxide / foam / sand / water / dry powder/ blanket	(3)	
		Petrol / diesel / oil/ gas/ alcohol/ uranium/ coal etc.	(3)	**[12]**
	(h)	Photosynthesis / fizzy drinks / dry ice/ fire extinguisher	(3)	
		milky/ white/ cloudy	(3)	
		Carbon or oxygen	(3)	
		Oxygen / nitrogen / helium / water vapour/ named noble gas	(3)	**[12]**
	(i)	Red/ pink	(3)	
		Orange juice	(3)	
		Oven cleaner or toothpaste	(3)	
		Distilled water	(3)	**[12]**

(j) Filtration (3)
Filter or paper (3)
Water (3)
Salt dissolves (soluble)/ passes through (3) **[12]**

(k) Heart (3)
Kidney (3)
Eye (3)
Nerves (3) **[12]**

(l) Cold / flu / measles / mumps / rubella / AIDS / HIV / meningitis / MMR (measles, mumps, rubella)/ pox/ cold sore (3)
Athlete's foot / ringworm / thrush / (3)
Bacteria/ amoeba/ plankton (3)
Food / cheese flavouring / antibiotics/ beer/ wine/ yoghurt (3) **[12]**

(m) **Source:** Meat / fish / eggs / cheese / beans / peas / TVP / soya / tofu/ milk/ pasta/ nuts (3)

Function: Growth / repair / maintenance (3)

Source: Bread / flour / cakes / potatoes / pasta / peas / beans/ rice / cereals (3)

Function: energy (3) **[12]**

(n) Shoot (3)
Root (3)
any correct function of the shoot part
make food / reproduction/ support/ transport (3)
any correct function of the root part
anchorage / Absorption of water (minerals)/ storage/support (3) **[12]**

(o) **Any two of:**
Growth / movement / sensitivity / respiration / excretion/ development (2×3)

Any one
Food / medicine / pleasure / oxygen production/ shelter/ visual/ fuel/ construction material / wooden items e.g. furniture (3)

Any one
Food / materials / pleasure / sport/ fur/ wool/ leather/ silk (3) **[12]**

SECTION B – PHYSICS (72 marks)

ANY TWO QUESTIONS

Q2 (a)

Potential	(3)	
Chemical	(3)	
Heat	(3)	
Kinetic	(3)	**[12]**

(b)

A	(3)	
A has insulation (cotton wool) / B has no insulation (cotton wool)	(3)	
Any two of:		
Draught excluder / attic (cavity} (wall) (floor) insulation / double glazed window/ curtains/ carpets	(2 × 3)	**[12]**

(c) **State or Show**

Ball and ring	(3)	
Ball fits through	(3)	
Heat ball	(3)	
Result / conclusion/ ball does not fit	(3)	**[12]**

[No diagram deduct 3 marks]

(Accept alternative experiments)

Q3	(a)	Vibrating	(3)	
		Energy	(3)	
		Vacuum	(3)	
		Echo	(3)	**[12]**
	(b)	B	(3)	
		Reflection	(3)	
		Periscope	(3)	
		See over crowds(walls)/ submarine	(3)	**[12]**
	(c)	Blue	(3)	
		Yellow	(3)	
		White	(3)	
		Prism	(3)	**[12]**

Q4	(a)	Brown	(3)	
		Neutral	(3)	
		Z	(3)	
		Safety/ limits current	(3)	**[12]**
	(b)	Gets hot/ heats	(3)	
		Electrical to heat	(3)	
		Electric kettle / immersion heater/ cooker/ toaster	(3)	
		Never use appliance with wet hands/ earthed/ fuse/ MCB/ any valid safety precaution	(3)	**[12]**
	(c)	Repel/ move away	(3)	
		Attract/ move towards	(3)	
		Iron / steel/ nickel / cobalt (or their alloys)	(3)	
		Picking up pins / close doors (press / fridge) /memo holders/ Motors/ door bell/ central locking/ dynamo	(3)	**[12]**

SECTION C – CHEMISTRY (72 MARKS)

ANY TWO QUESTIONS

Q5	(a)	Dissolves	(3)	
		Solvent	(3)	
		Concentrated	(3)	
		Dilute	(3)	**[12]**
	(b)	Distillation	(3)	
		condenser/ Liebig	(3)	
		Y	(3)	
		water	(3)	**[12]**
	(c)	Magnet	(3)	
		Heat	(3)	
		Brass / solder / bronze/ stainless steel..	(3)	
		Any correct use; Use must match named alloy		
		Brass: plumbing/ door fittings/		
		Stainless steel: cars/ pots/ sinks		
		Solder: joining metals	(3)	**[12]**

Q6	(a)	Protons	(3)	
		Protons / neutrons	(3)	
		Neutrons	(3)	
		Electrons	(3)	**[12]**
	(b)	Hydrogen/ H_2	(3)	
		Calcium / magnesium/ zinc/ iron	(3)	
		Any two of: Point test tube away / wear goggles / wear lab coat / tie hair back/ test tube holder	(2 × 3)	**[12]**
	(c)	A	(3)	
		Absorb moisture (water)	(3)	
		Any two of: Oiling (greasing) / painting (varnishing) / polishing / galvanising / plastic coating/ plating	(2 × 3)	**[12]**

Q7	(a)	Sulphur dioxide	(3)	
		Coal / oil / gas	(3)	
		Wears away limestone / corrosion of metals/ damages plants /lakes / kills fish/ water pollution	(3)	
		Universal indicator/ pH (indicator) paper	(3)	**[12]**
	(b)	B	(3)	
		Boiling	(3)	
		Ion exchange/ distillation	(3)	
		Nicer taste / minerals / good for brewing (tanning)/ teeth	(3)	**[12]**
	(c)	**State or Show**		
		Container and ice	(3)	
		Drops/ water/ mist/ condensation	(3)	
		Test with cobalt chloride / anhydrous copper sulphate	(3)	
		Result / conclusion / pink/ blue	(3)	**[12]**

[No diagram deduct 3 marks]

SECTION – BIOLOGY (72 marks)
ANY TWO QUESTIONS

Q8	(a)	Enamel / crown	(3)	
		Grinding / chewing/ crushing	(3)	
		Premolars / canine / incisors	(3)	
		Calcium / phosphorous/ fluoride	(3)	**[12]**
	(b)	Stomach	(3)	
		Large intestine / colon	(3)	
		Digestion / mixing of food / enzyme production / acid production		
		Disinfection	(3)	
		Enzyme/acid (HCl) / any named enzyme/ bile	(3)	**[12]**
	(c)	Lung	(3)	
		Trachea / wind pipe	(3)	
		Ribs	(3)	
		Keep air tubes open / prevent collapse of air tubes	(3)	**[12]**

Q9	(a)	Sepal	(3)	
		Stamen	(3)	
		Carpel	(3)	
		Petal	(3)	**[12]**
	(b)	Self	(3)	
		Wind	(3)	
		Avoid competition / more space / colonisation	(3)	
		Flower / carpel / female part / ovule	(3)	**[12]**
	(c)	Oxygen	(3)	
		Leaf	(3)	
		Any two of:		
		Carbon dioxide / water / light / chlorophyll	(2 × 3)	**[12]**

Q10	(a)	Pitfall trap	(3)	
		Protect animals / provide shelter/ keep dry	(3)	
		Any two of:		
		Woodlouse / beetle / spider / millipede / centipede etc..	(2 × 3)	**[12]**
	(b)	Any two of:		
		sand / silt / clay/ gravel	(2 × 3)	
		Woodlouse / beetle / spider / millipede / centipede / worm/ Fungi/ bacteria	(3)	
		Nutrients / improves texture / drainage/ retain moisture	(3)	**[12]**
	(c)	**State or Show**		
		Seeds in 2 containers	(3)	
		One with and one without moisture	(3)	
		Leave for a time	(3)	
		Result/conclusion/ one container has germination	(3)	**[12]**

[No diagram deduct 3 marks]

SECTION E – APPLIED SCIENCE (72 marks)

ANY TWO QUESTIONS

Q 11 EARTH SCIENCE

(a)	Stars	(3)	
	Satellite	(3)	
	Year	(3)	
	Light	(3)	**[12]**

(b)	Anemometer / wind meter	(3)	
	wind speed	(3)	
	Atmospheric (air) pressure	(3)	
	Rain gauge/ thermometer/ solometer/ vane/ hygrometer/ Stokes sunshine recorded	(3)	**[12]**

(c) State or Show

Same surface size/ identical containers	(3)	
Same amount of water	(3)	
One with hairdryer (fan)	(3)	
Result / conclusion	(3)	**[12]**

[No diagram deduct 3 marks]

Q12 HORTICULTURE

(a)	Growth of a seed (seedling)	(3)	
	Oxygen (air) / moisture (water)/ light/ dormancy over	(2 × 3)	
	Photosynthesis/ to make food/ to bend towards light	(3)	**[12]**

(b)	Growth medium / decayed (rotted) plant material	(3)	
	Cleaner / weed free / nutrient rich	(3)	
	Growth of plants in water	(3)	
	nutrients added	(3)	**[12]**

(c) State or Show

100 cm^3 fresh soil sample	(3)	
Add 100 cm^3water	(3)	
Mix / Leave for a time	(3)	
Total volume less than 200 cm^3 / result / conclusion	(3)	**[12]**

[No diagram deduct 3 marks]

Q13 MATERIALS SCIENCE

(a) Petrol / nylon (3)
Cotton (3)
Oak (3)
Nylon (3) **[12]**

(b) Cool iron (3)

Do not bleach (3) **[6]**

(c)

ANY ONE OF A, B, C, or D

A. Plastics

(i) Polythene / Perspex/ PVC/ Acrylic/ Nylon (3)

(ii) Crude oil (petroleum) (3)

(iii) State or Show

Add weight (force) to one plastic (3)
Measure bend (3)
Repeat with second plastic (3)
Comparison (3) **[18]**

[No diagram deduct 3 marks]

(Accept alternative experiments)

B. Textiles

(i) Spinning (3)
Weaving (3)

(ii) State or Show

Two fabrics same weight / size (3)
'Wear'/ rub with file (3)
Repeat with second textile (3)
Comparison (3) **[18]**

[No diagram deduct 3 marks]

(accept alternative experiments)

C. Metals

(i) Copper / lead/ gold/ silver/ iron/ mercury (3)
(ii) Iron / magnesium / calcium / aluminium (any metal) (3)

(iii) State or Show

Sharp (pointed) implement (3)
Scratch (3)
Repeat with second metal (3)
Comparison (3) **[18]**

[No diagram deduct 3 marks]

(Accept alternative experiments)

D. Timber

(i) Oak / ash / sycamore / beech / holly / hawthorn / white thorn… (3)

Furniture / floor boards / doors / hurley / boats / walking sticks / kitchen utencils… (3)

(ii) State or Show

Add weight (force) to one timber along grain (3)
Measure bend (3)
Repeat with second timber across grain (3)
Comparison (3) **[18]**

[No diagram deduct 3 marks]

(Accept alternative experiments)

Q14 FOOD

(a)	Calcium	(3)	
	Sugar	(3)	
	Orange juice	(3)	
	Lean meat	(3)	**[12]**

(b)	Bendedict's / Fehlings	(3)	
	Rub sample into brown paper/ grease spot test	(3)	
	Prevents constipation/ provides roughage	(3)	
	Correct amounts of right food types / healthy growth / prevent malnutrition / healthy body	(3)	**[12]**

(c) State or Show

Heat milk to 90 ºC	(3)	
Cool	(3)	
Add starter culture/ natural (live) yoghurt	(3)	
Incubate at 37 ºC/ keep warm	(3)	**[12]**

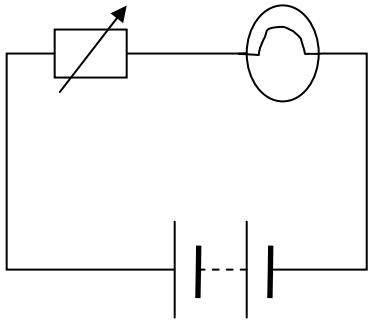
[No diagram deduct 3 marks]

Q15 ELECTRONICS

(a) Variable resistor (3)
Ammeter (3)
Voltmeter (3)
LED (3) **[12]**

(b) Dependant (3)
Low / no/ dark (3)
Bright (3)
Turning on street light (house lights)/ lightmeter (3) **[12]**

(c) Show on diagram



Battery (3)
Bulb (3)
Variable resistor (3)
In series/ circuit complete (in any order) (3) **[12]**

Q16 ENERGY CONVERSIONS

(a)	Electrical to heat	(3)	
	Potential to kinetic	(3)	
	Chemical to electrical	(3)	
	Chemical to heat	(3)	**[12]**

(b)	Iron	(3)	
	Temporary	(3)	
	Attracted / moves	(3)	
	Lifting cars in scrap yard / relay / doorbell / transformer / chargers / Door locks / central locking/ motors	(3)	**[12]**

(c) State or Show

Container of water	(3)	
Burning peanut	(3)	
Measure temperature/ thermometer	(3)	
Water gets hotter	(3)	**[12]**

[No diagram deduct 3 marks]