



Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2006

SCIENCE

(1989 Syllabus)

ORDINARY LEVEL

Marking Scheme

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 uncanceled 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).

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	
	<i>Without LS</i>	<i>With LS</i>
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

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), $6 + 2 \times 3$

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), (b) & (c), 4×3

Question 13

(a), 4×3 ; (b), 2×3 ; (c), 6×3

Question 14

(a), (b) & (c), 4×3

Question 15

(a), (b) & (c), 4×3

Question 16

(a), (b) & (c), 4×3

Marking Scheme 2006 (1989) Science Ordinary Level

Q1	(a)	Graduated(measuring) cylinder	(3)
		Tripod	(3)
		Tongs	(3)
		flask	(3)
	(b)	Insulation	(3)
		Evaporation	(3)
		Radiation	(3)
		Convection	(3)
	(c)	Copper	(3)
		Plastic/PVC/Rubber	(3)
Brown		(3)	
Safety / prevent electrocution (overload)/ breaks circuit		(3)	
(d)	Volume	(3)	
	Area	(3)	
	Mass	(3)	
	Length	(3)	
(e)	Mercury	(3)	
	Pluto	(3)	
	Any two of		
	Water/oxygen/warmth/ light/ suitable elements	(2 × 3)	
(f)	Carbon	(3)	
	Hydrogen	(3)	
	Carbon dioxide (CO ₂)/ water (H ₂ O)	(3)	
	Coal/oil/turf/peat	(3)	
(g)	Separating (tap) funnel	(3)	
	Oil	(3)	
	Open tap	(3)	
	Alcohol and water mix/ dissolve /solution	(3)	
(h)	B	(3)	
	Heat/ any source of heat	(3)	
	Melting/ fusion	(3)	
	Condensation	(3)	
(i)	Toothpaste	BASIC	(3)
	Vinegar	ACIDIC	(3)
	Oven cleaner	BASIC	(3)
	Distilled water	NEUTRAL	(3)
(j)	Calcium carbonate (CaCO ₃)/ marble chips/ limestone/ chalk/ any carbonate or bicarbonate (hydrogencarbonate)	(3)	
	Hydrochloric acid (HCl)/ acid/ named acid	(3)	
	Fizzy drinks/fire extinguishers/dry ice/photosynthesis/ baking	(3)	
	Limewater	(3)	

- | | | |
|-----|---|-----|
| (k) | Mosquito | (3) |
| | Greenfly | (3) |
| | Foxglove | (3) |
| | Wheat | (3) |
| (l) | A | (3) |
| | growth/exercise/breathing/ movement (any named movement)/ | |
| | heat | (3) |
| | B | (3) |
| | To prevent constipation/ helps material move through bowel | (3) |
| (m) | Eyes | (3) |
| | Hearing | (3) |
| | Smell | (3) |
| | Tongue/ taste buds | (3) |
| (n) | Leaf/ green named part of plant | (3) |
| | Chlorophyll | (3) |
| | Photosynthesis | (3) |
| | Iodine | (3) |
| (o) | Yogurt/cheese/antibiotics/medicine/ probiotic/ decomposer/ | |
| | intestinal flora/ supply vitamins/ helps immune system | (3) |
| | Disease/food spoilage/ food poisoning/ infection | (3) |
| | Food/flavour cheese/antibiotics/brewing/ decomposer/ medicine | (3) |
| | Cold/flu/measles/mumps/rubella/AIDS/HIV/ meningitis/ | |
| | MMR | (3) |

- Q2 (a) Metre stick/tape/ruler/trundle wheel/ opisometer/ laser/pedometer (3)
 Clock/stopwatch/timer (3)
 Metres per second (m/s) / Kilometre per hour (km/h)/mph (3)
 12/ 720 m per min (3)
- (b) No (3)
 Atmosphere has pressure (3)
 Any two of
 Weight / push / pull / electric / magnetic/nuclear/ gravity/
 Electromagnetic/ G force
Accept compression/ tension (traction)/ torque (twist)/ shear (2 × 3)
- (c) State or Show (4 × 3)
 Pull block (3)
 using spring balance (3)
 Repeat using sandpaper (3)
 Result/conclusion/ measure (3)

[No diagram/ diagram with no label deduct 3 marks]

- Q3
- (a)
 - Repel (3)
 - Attract (3)
 - Iron/nickel/cobalt (3)
 - Loudspeaker / memo holder / fridge door / cupboard clasp (3)

 - (b)
 - Heats/ warms/ boils/ bubbles (3)
 - Electrical to heat (3)
 - 8 (3)
 - 80 (3)

 - (c)
 - Increases (3)
 - Bubbles in the water (3)
 - Travels up tube/ into flask/level drops (3)
 - Contracts (3)

Q4	(a)	Energy	(3)
		Echo	(3)
		Substance	(3)
		Vibrations	(3)
	(b)	Dispersion	(3)
		Prism	(3)
		Orange	(3)
		Green	(3)
	(c)	State or Show	(4 × 3)
		Graduated cylinder or Displacement can with water	(3)
		Add in stone	(3)
		Water level rises or Water is displaced	(3)
		Result/Conclusion	(3)

[Before and after diagrams can get (4 × 3)]

[No diagram/ diagram with no label deduct 3 marks]

Q5	(a)	Potassium	(3)
		Air	(3)
		Nitrogen	(3)
		Water	(3)
	(b)	Distillation	(3)
		condenser	(3)
		100	(3)
		Mostly water	(3)
	(c)	Temporary/Permanent	(3)
		Nicer taste/minerals/good for brewing/ calcium	(3)
		Limescale/forms scum/blocks pipes/wastes soap	(3)
		Boiling/ion exchange/bath salts/softener/ soap	(3)

- Q6 (a) Dissolves (3)
Solvent (3)
Concentrated (3)
Dilute (3)
- (b) Electrocutation/water conducts/ shock (3)
Halon/foam /dry powder/ carbon dioxide (CO₂) (3)
Air/Oxygen (3)
Fuel (3)
- (c) (4 × 3) State or Show
- Container with ice (3)
Droplets form (3)
cobalt chloride or copper sulphate/ boil (3)
turns pink/ turns blue/ 100 °C (matched) (3)

[No diagram/ diagram with no label deduct 3 marks]

- Q7
- (a) Sodium (3)
Mercury (3)
Gold/ aluminium (3)
Aluminium (3)

 - (b) Water (3)
air/ oxygen (3)
Galvanising/painting (varnish)/oil/grease/enamel/ plastic (3)
Alloy (3)

 - (c) Covering (coating) a metal (3)
with another metal (3)
Erodes/wears away/gets smaller/loses copper (mass) (weight) (3)
Dissolves (3)
Protect against or prevent corrosion/ looks better/ value added (3)

- Q8
- (a) Enamel/ crown (3)
Calcium/ phosphorous/ fluoride (3)
Plaque/ decay/ bad breath/ discolouration (3)
Brushing/Flossing/checkups/less sweets or fizzy drinks/ scaling (3)

 - (b) Windpipe/trachea/ air pipe (3)
Lungs (3)
Chest/ thorax/ rib cage (3)
Inflate/fill with air/ get bigger (3)

 - (c) Kidney (3)
Bladder (3)
Urine/urea/ water/ salt (3)
Skin/lungs (3)

- Q9
- (a) Woodland /seashore/hedgerow/ playing pitch/ grass/ bog/ Mountain/ fen/ fresh water/ marsh/ salt water... (3)
 Any named animal (3)
 Adaptation to match named animal (3)
 Food/shelter/ nesting/ hide/ protection/oxygen... (3)
- (b) Self/ exploding (3)
 Wind (3)
 Avoid competition/away from parent/ colonise/.spread (3)
 Flower/ carpel/ ovary/ ovule (3)
- (c) (4 × 3) State or Show
- Two containers with seeds (3)
 Both with water and open to the air (3)
 One in fridge / one at room temperature/ at different temperatures (3)
 Seeds with warmth germinate (3)

[No diagram/ diagram with no label deduct 3 marks]

- Q10 (a) Red blood corpuscles (3)
 White blood cells (3)
 Platelets (3)
 Plasma (3)
- (b) Pumps blood around body (3)
 Wrist/neck/groin/temple (3)
 Exercise/excitement/stress/shock/ fear (3)
 Exercise/eat healthy food/eat less fatty food/ no smoking/ (3)
 Fruit/ vegetables/ wholegrain (3)
- (c) Any two of:
 Support/protection/movement/ blood formation/
 gives body shape (2 × 3)
 Flexible/rubbery/soft/loses minerals (3)
 Nothing (3)

Q11	(a)	24	(3)
		28	(3)
		4	(3)
		$365\frac{1}{4}$	(3)
	(b)	Moisture/water/ vapour	(3)
		Hygrometer/ wet and dry thermometers	(3)
		Wind speed	(3)
		Pressure	(3)
	(c)	(4 × 3) State or Show	
		Rain gauge	(3)
		Placed outside	(3)
		Leave for a time	(3)
Collect and measure		(3)	

[No diagram/ diagram with no label deduct 3 marks]

- Q12 (a) Clay/gravel/sand/silt/stones/ water/ air/ minerals/ named mineral (3)
 Any two of:
 Decomposer (recycling nutrients)/mixes layers/ (2 × 3)
 improves aeration/ drainage/ structure/ texture (3)
 any named woody plant
- (b) Antirrhinum/lobelia/alyssum... (3)
 Greenfly (aphid)/slug/snail/birds/caterpillars (3)
 Morning/ evening (3)
 Hoeing/mulching/bark/stones/weeding/ (3)
 spraying/weed block/ bedding mat
- (c) (4 × 3) State or Show
 Known volume (100 cm³) of water (3)
 Known volume (100 cm³) of soil (3)
 Mix and record new volume (3)
 Less than 200/ smaller (3)

[No diagram/ diagram with no label deduct 3 marks]

- Q13 (a) Silver (3)
 Polythene (3)
 Oil (3)
 Wool (3)
- (b) Cool iron (3)
 hand in bowl (3)
- (c) **Plastics**
- (i) Jugs/bowls/bags (3)
 (ii) oil (3)
- (iii) (4 × 3) State or Show
- sharp (pointed) implement (3)
 Scratch (3)
 Repeat with second plastic (3)
 Comparison (3)

[No diagram/ diagram with no label deduct 3 marks]

Textiles

- (i) Fibres (3)
 (ii) Fabrics (3)
 (iii) State or Show (4 × 3)
 File/ sand paper (3)
 Apply to Fabric 1 (3)
 Apply to Fabric 2 (3)
 Comparison (3)

[No diagram/ diagram with no label deduct 3 marks]

Metals

- (i) gold/ silver/ platinum/ rhodium (3)
 - (ii) any named metal (3)
 - (iii) State or Show (4 × 3)
-
- add weight (force) to one metal (3)
 - measure bend (3)
 - repeat with second metal (3)
 - Comparison (3)

[No diagram/ diagram with no label deduct 3 marks]

Timber

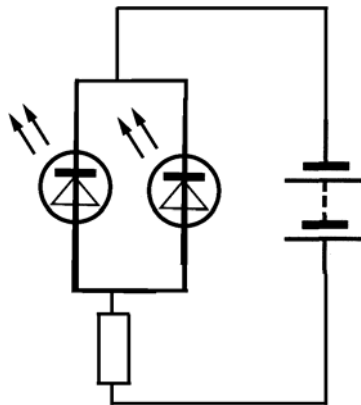
- (i) Soft (3)
 - (ii) Hard (3)
 - (iii) State or Show (4 × 3)
-
- add weight (force) to one piece of timber parallel to grain (3)
 - measure bend (3)
 - repeat with second piece of timber at right angles to grain (3)
 - Comparison (3)

[No diagram/ diagram with no label deduct 3 marks]

- Q14 (a) all foods in list (3)
Milk (3)
Onions/ fish (3)
All foods in list (3)
- (b) Any two of:
Improve colour or flavour/anti-oxidant/ sweeten/ texture (2 × 3)
Cause allergic reaction/ hyperactivity (3)
Colour (3)
- (c) State or Show (4 × 3)
grass (3)
Suitable container/ add (sugar) (molasses) (acid) (bacteria) (3)
Airtight conditions/ compress (3)
Leave for a time (3)

[No diagram/ diagram with no label deduct 3 marks]

- Q15 (a) Variable resistor (3)
 Ammeter (3)
 Battery (3)
 LDR (3)
- (b) Two way switch (3)
 Yes (3)
 Limit current /protect LED (3)
 Any named room except the bath room (3)
- (c) Show (4 × 3)
 LEDs in parallel (3)
 Both forward biased (3)
 Resistor in series (3)
 Circuit complete (3)



- Q16 (a) Chemical to heat/ chemical to light (3)
 Kinetic to sound (3)
 Chemical to light (3)
 Electrical to heat (3)
- (b) Iron (3)
 Temporary (3)
 Attracted to core/lifted up/ moves (3)
 Lifting cars in scrap yard/relay/doorbell/ transformer/ chargers/
 Door locks (3)
- (c) State or Show (4 × 3)
- Container of water (3)
 Burning peanut (3)
 Measure temperature/ thermometer (3)
 water gets hotter (3)

[No diagram/ diagram with no label deduct 3 marks]