Coimisiún na Scrúduithe Stáit

State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2007

SCIENCE (without Local Studies)

[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 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).

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

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), (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 2007 (1989) Science Ordinary Level

Q1	(a)	Tripod	(3)
		Microscope	(3)
		Measuring (graduated) cylinder	(3)
		Funnel	(3)
	(b)	Balance	(3)
		Gram (g) / kilogram (kg)	(3)
		Opisometer	(3)
		Centimetre (cm) / metre (m) / millimetre (mm)	(3)
	(c)	Plastic/ nylon/ bakelite/ PVC/ rubber	(3)
		Blue	(3)
		Live	(3)
		Safety / prevent electrocution (overload) / breaks circuit	(3)
	(d)	Radiation	(3)
		Conduction	(3)
		Convection	(3)
		Insulation	(3)
	(e)	Increases/ expands/ gets bigger	(3)
		Water rises up the tube	(3)
		Drops down/ falls	(3)
		Thermometer	(3)
	(f)	copper	(3)
		silver	(3)
		nitrogen	(3)
		carbon	(3)
	(g)	Filtration/ filtering	(3)
		Filter paper	(3)
		water	(3)
		Both liquids both would go through filter paper/ alcohol dissolves in water (they form a solution)	(3)
	(h)	Physical: Melting of ice, dissolving salt in water	(2 × 3)
		Chemical: Burning of coal, frying an egg	(2 × 3)
	(i)	A/ tube with nails and water only	(3)
		All conditions present / air (oxygen) and water present	(3)
		Keeps oxygen (air) out	(3)
		Oiling/painting(varnish) / greasing / plastic coating / enamel / galvanising	(3)
	(j)	Calcium carbonate ($CaCO_3$) / marble chips / limestone / chalk / any carbonate or bicarbonate (hydrogencarbonate) name or formula	(3)
		Hydrochloric acid (HCl) / acid / named acid	(3)
		Fizzy drinks / fire extinguishers / dry ice / photosynthesis / baking	(3)
		Milky / white	(3)

(k)	Kidney	(3)
	Eye	(3)
	Testes	(3)
	Skeleton	(3)
(l)	Any wild animal	(3)
	Any named plant	(3)
	Food / work / pleasure / transport / hunting / sport / companion	(3)
	Food / medicine / pleasure / oxygen production/ construction material / wooden items e.g. furniture	(3)
(m)	Butter / cream / fat meat / nuts / eggs / cheese / chips/ crisps	(3)
	Provides energy / insulation	(3)
	Meat / fish / eggs / cheese / beans / peas / TVP / soya / tofu	(3)
	Growth / repair / maintenance	(3)
(n)	Leaf/ green stem	(3)
	Photosynthesis	(3)
	Oxygen	(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)
	Cold / flu / measles / mumps / rubella / AIDS / HIV / meningitis / MMR (measles, mumps, rubella)	(3)
	Athlete's foot / ringworm	(3)

Q2	(a)	Any <u>two</u> from: gravity / electrical / centrifugal / push / pull / magnetic / weight / tension / compression / torsion / (twisting) / shear	(2 × 3)
		Oiling/waxing/polishing	(3)
		Grip on road / grip on steering / brakes / soles of shoes / pedals	(3)
	(b)	Nutcracker / scissors / door (window)handle / screwdriver / seesaw / wheel barrow / arms / legs…	(3)
		A	(3)
		No	(3)
		Atmospheric (air) pressure	(3)
	(c)	(4 × 3) State or Show	
		Ball and ring	(3)
		Ball fits through	(3)
		Heat ball	(3)
		Result / conclusion	(3)

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

(accept alternative experiments)

Q3	(a)	Ampere / Amp	(3)
		Volts	(3)
		Watt	(3)
		Kilowatt-hour / kWh	(3)
	(b)	Heats / warms	(3)
		Thermometer	(3)
		12 / (3 × 4)	(3)
		120 / (12 × 10) / (3 × 4 × 10)	(3)
	(c)	Repel / move apart / push away	(3)
		Magnet would stick to metal/so magnet won't stick / not attracted	(3)
		Compass	(3)
		Electromagnet/fridge door seal/ memo holder (fridge magnet) electric motors / speakers / TV / PC / video / phones…	(3)

Q4	(a)	Work	(3)
		Solar	(3)
		Coal	(3)
		Nuclear	(3)
	(b)	Spectrum (rainbow)	(3)
		Prism	(3)
		Orange	(3)
		Yellow	(3)
	(c)	Reflection	(3)
		light / bulb	(3)
		No light	(3)
		Travels in straight lines	(3)

Q5	(a)	Gas	(3)
		Solid	(3)
		Liquid	(3)
		Liquid	(3)
	(b)	Hydrogen / oxygen	(2 × 3)
		100	(3)
		Surface tension	(3)
	(c)	Temporary	(3)
		Nicer taste / minerals / calcium / good for brewing / good for brewing (tanning)	(3)
		Limescale / forms scum / blocks pipes / wastes soap	(3)
		B	(3)

Q6	(a)	Electrons	(3)
		Neutrons	(3)
		Protons	(3)
		Electrons	(3)
	(b)	Red	(3)
		Blue	(3)
		Universal (pH) paper	(3)
		Higher than 7	(3)
	(c)	(4 × 3) State or Show	
		Mixture of salt and water	(3)
		Container	(3)
		Heat	(3)
		Result / conclusion	(3)

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

Q7	(a)	Air (oxygen) / fuel (named fuel)	(2 × 3)
		Carbon dioxide / foam / dry powder / halon / sand	(3)
		Any valid precaution / fire (spark) guard / unattended oil on cooker / not cleaning chimney / not servicing heating system / overloading electrical supply…	(3)
	(b)	Sulphur dioxide/nitrogen oxide(s)	(3)
		Coal/oil/gas/peat	(3)
		Any <u>two</u> from: Damage to buildings/lakes/trees / kills fish / corrosion of metals …	(2 × 3)
	(c)	Anhydrous copper sulphate / cobalt chloride	(3)
		blue/ pink **matched**	(3)
		Contains water / moisture	(3)
		Supports combustion (burning) / respiration / breathing tanks for divers / welding / medicine rockets / respiration…	(3)

Q8	(a)	Enamel / crown	(3)
		Calcium / phosphorous	(3)
		Molars	(3)
		Grinding / chewing / cutting / biting / tearing	(3)
	(b)	Stomach	(3)
		Large intestine / colon	(3)
		Digestion / mixing of food / enzyme production / acid production	(3)
		Enzyme/acid (HCl) / named enzyme	(3)
	(c)	Lung	(3)
		Trachea / rings of cartilage / wind pipe	(3)
		Ribs	(3)
		Keep air tubes open / prevent collapse of air tubes	(3)

Q9	(a)	Sepal	(3)
		Carpel / ovary	(3)
		Stamen / anther	(3)
		Petal / nectary	(3)
	(b)	To get light	(3)
		Photosynthesis / make food	(3)
		Leaf / tip / shoot / leaf	(3)
		Water (moisture) / warmth / oxygen (air) / light / dormancy over	(3)
	(c)	(4 × 3) State or Show	
		Coloured water in container	(3)
		Suitable plant, e.g. celery	(3)
		Leave for a time	(3)
		Result/conclusion	(3)

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

Q10	(a)	Transport of materials	(3)
		Heart	(3)
		Plasma	(3)
		Blood vessels	(3)
	(b)	Wrist/neck	(3)
		Exercise /excitement / shock / fear	(3)
		Makes heart muscle fit / less strain on heart eat healthy food / eat less fatty food / no smoking / low alcohol consumption / check blood pressure (cholesterol)…	(3)
		fruit / vegetables / wholegrain	(3)
	(c)	Ovary	(3)
		Fallopian tube/oviduct	(3)
		Release (produces) egg (ovum)/releases (produces) hormones (named hormone)	(3)
		B / fallopian (tube) / oviduct	(3)

Q11	(a)	24	(3)
		28	(3)
		366	(3)
		365¼	(3)
	(b)	Anemometer / wind meter	(3)
		Measure wind speed	(3)
		Rain gauge	(3)
		Atmospheric pressure	(3)
	(c)	(4 × 3) State or Show	
		Same surface size	(3)
		Same amount of water	(3)
		Heat one with hairdryer/in a warm place	(3)
		Result/conclusion	(3)

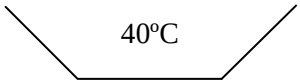
[No diagram / diagram with no label deduct 3 marks]

Q12	(a)	Any <u>two</u> from: support / medium / minerals / water / air	(2 × 3)
		Any <u>two</u> from: mix layers / add humus / add nutrients / improve texture(drainage) / aeration	(2 × 3)
	(b)	Any suitable woody plant e.g. grisellinia / escallonia / privet	(3)
		Any suitable non-woody plant e.g. busy lizzie / geranium	(3)
		Rooting powder (gel) / rooting liquid / hormone	(3)
		Watering / cover with plastic/warm place/light/feeding	(3)
	(c)	(4 × 3) State or Show	
		Find mass of fresh soil sample	(3)
		Oven at 100ºC	(3)
		Leave for a time	(3)
		Find mass of dry sample/result/conclusion	(3)

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

Q13 (a) Metal (3)
Textile (3)
Timber (3)
Plastic (3)

(b) Tumble dry (3)



(3)

(c) **Plastics**

(i) Bags / boxes / silage cover (3)
(ii) Crude) oil (3)

(iii) (4 × 3) State or Show

Add boiling water to both containers (two different plastics) (3)
Leave for a time (3)
Measure temperature of water (3)
Comparison (3)

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

(accept alternative experiments)

(b) **Textiles**

(i) Spinning (3)
(ii) Weaving

(3)

(iii) (4 × 3) State or Show

two fabrics same weight / size (3)
soak (3)
drip (3)
reweigh and compare (3)

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

(accept alternative experiments)

(c) **Metals**

(i) Copper / zinc / lead (3)
(ii) Iron / magnesium / calcium / aluminium (any metal) (3)

(iii) (4 × 3) State or Show

Sharp (pointed) implement (3)
Scratch (3)
Repeat with second metal (3)
Comparison (3)

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

(accept alternative experiments)

(d) **Timber**

(i) Oak / ash / sycamore / beech / holly / haw thorn / white thorn… (3)
(ii) Furniture / floor boards / doors / hurley / boats / walking sticks / kitchen utencils… (3)

(iii) (4 × 3) State or Show

Add weight (force) to one timber (3)
Measure bend (3)
Repeat with second timber (3)
Comparison (3)

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

(accept alternative experiments)

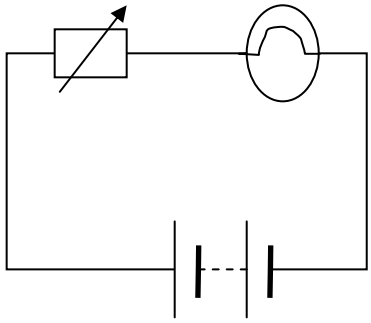
Q14	(a)	Coffee / milk / meat / fish	(3)
		Milk	(3)
		Meat / fish	(3)
		Meat / fish	(3)
	(b)	Needed for health	(3)
		To prevent constipation/absorb water help movement of materials	(3)
	Fat	(3)	
		Benedict's (Fehling's) solution	(3)
	(c)	(4 × 3) State or Show	
		Cream	(3)
		Whisk/churn/shake	(3)
		Liquid and solid formed	(3)
		separate	(3)

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

Q15 (a) Variable resistor (3)
Ammeter (3)
Diode (3)
LED (3)

(b) Dependant (3)
low / no (3)
bright (3)
Turning on street light (house lights) (3)

(c) (4 × 3) Show



Battery (3)
Bulb (3)
Variable resistor (3)
Circuit complete (3)

Q16 (a)

Chemical to heat / chemical to light	(3)
Kinetic to sound	(3)
Chemical to light / chemical to heat / chemical to electrical / electrical to light / electrical to heat	(3)
electrical to heat	(3)

(b)

Iron	(3)
attracted / moves	(3)
Chemical to electrical / electrical to magnetic / electrical to heat / Electrical to heat	(3)
Lifting cars in scrap yard / relay / doorbell / transformer / chargers / door locks / central locking	(3)

(c) (4 × 3) State or Show

Container of water	(3)
Burning peanut	(3)
Measure temperature/ thermometer	(3)
Water gets hotter	(3)

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