Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2015

Marking Scheme

Science

Ordinary Level

Note to teachers and students on the use of published marking schemes

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

Future Marking Schemes

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

General Points regarding the Marking Scheme for Junior Certificate Science

1. In many cases only key phrases are given in the marking scheme. 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 word(s) / phrase(s) used in the scheme 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 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. If the incorrect calculated value is used in a subsequent calculation 'correctly' allow the marks for the subsequent calculation.

7. Cancelled and/or Repeated Answers

(a) 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.

(b) If more than the required number of (uncancelled) answers are given, surplus incorrect answers cancel the marks awarded for correct answers.

(c) If the only answer offered is cancelled, the cancelling is ignored and the answer marked as normal.

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.

BIOLOGY

Question 1 (7 × 6 + 1 × 10)

Question 2
(*a*) 6 + 5 × 3
(*b*) (*i*) 3 (*ii*) 3 (*iii*) 2 × 3 (*iv*) 2 × 3

Question 3
(*a*) (*i*) 3 × 3 (*ii*) 3 (*iii*) 3
(*b*) 2 × 3
(*c*) (*i*) 3 (*ii*) 3 (*iii*) 2 × 3 (*iv*) 3 (*v*) 3

CHEMISTRY

Question 4 (7 × 6 + 1 × 10)

Question 5
(*a*) (i) 3 (*ii*) 3 (*iii*) 3
(*b*) 6 + 4 × 3
(*c*) 4 × 3

Question 6
(*a*) 6 + 4 × 3
(*b*) (*i*) 3 (*ii*) 3 (*iii*) 3 (*iv*) 2 × 3 (*v*) 2 × 3

PHYSICS

Question 7 (7 × 6 + 1 × 10)

Question 8
(*a*) (*i*) 3 (*ii*) 3 (*iii*) 3 (*iv*) 3
(*b*) (*i*) 2 × 3 (*ii*) 3
(*c*) 6 + 4 × 3

Question 9
(*a*) (*i*) 3 (*ii*) 3 (*iii*) 3
(*b*) (*i*) 3 (*ii*) 3 (*iii*) 3 (*iv*) 3
(*c*) (*i*) 3 (*ii*) 3 (*iii*) 3 (*iv*) 3
(*d*) (*i*) 3 (*ii*) 3

Biology (130 MARKS)

Question 1 (52)

(*a*) **Any two from**: (2 × 3)
movement // respiration // sensitivity (response) // nutrition (feeding) // excretion // growth

(*b*) (*i*) **A** – artery (3)

(*ii*) **V** – vein (3)

A
V

(*c*) (*i*) **P** – 70 (3)

(*ii*) **C** - increase (3)

	37 b.p.m.
P	**70 b.p.m.**
C	**Increase**
	Decrease

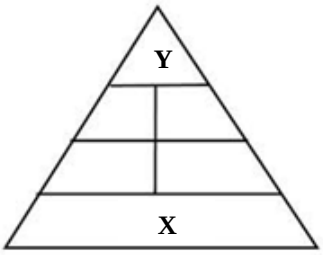
(*d*) (*i*) Chemical – Biuret reagent / copper sulfate / sodium hydroxide (3)

(*ii*) **C** – purple (3)

	Yellow
C	Purple

(*e*) (*i*) **X** – bottom of pyramid (3)

(*ii*) **Y** – top of pyramid (3)



(*f*) photosynthesis *(6)

(*g*) (*i*) Enzyme – amylase (3)

(*ii*) Product – maltose (3)

(*h*) **Award 6m for first correct answer and 2m for each subsequent correct answer.**

(*i*) alcohol / methylated spirits /any named alcohol

(*ii*) flammable

(*iii*) keep away from flames (heat) / accept any valid safety precaution
e.g.ventilation / suitable storage / wear safety equipment / wipe up spills etc.

Question 2 (39)

(*a*) **Award 6m for first correct answer and 3m for each subsequent correct answer.**

(*i*) **A** – fallopian tube

(*ii*) **B** – uterus (womb)

(*iii*) **C** – vagina

B
C
A

(*iv*) produce egg (gamete) / make hormones (oestrogen / progesterone)

(*v*) A / fallopian tube

(*vi*) Any **one** correct method
condom / the pill / natural (rhythm method) / coil (IUD) / diaphragm / surgical spermicides / bar (hormonal implant) etc.

(*b*) (*i*) cancer / bronchitis / emphysema / causes coughing / clogs airways / damages alveoli (air sacs) / may cause asthma (3)

(*ii*) ribs (3)

(*iii*) oxygen (3)

carbon dioxide (3)

(*iv*) **A** – leaf (3)

B – stem (3)

Question 3 (39)

(*a*) (*i*) first **correct** bar (3)

second **correct** bar (3)

third and fourth **correct** bar (3)

Note: Deduct 3m for error in graph
e.g. trend graph / points plotted / incorrect width of bars

(*ii*) clover / buttercup (3)

(*iii*) quadrat / identification key / transect (3)

(*b*) **Positive effect – accept any valid answer** (3)

e.g. reusing / recycling / composting / burning smokeless fuels / alternative fuels e.g. renewable / improved farming practices or named example / reducing pollution / improved planning / breeding programmes for endangered species / reforestation/ nature reserves etc.

Negative effect – accept any valid answer (3)

e.g. pollution / combustion of fuels / littering/ deforestation / oil spills etc.

(*c*) (*i*) food for micro-organisms (3)

(*ii*)

	Micro-organisms are growing in the dishes
S	**No living micro-organisms are present in the dishes**

(3)

(*iii*) **Air** – expose agar plate to air (3)

Soil – add soil (3)

(*iv*) experiment for comparison /to show that micro-organisms come from air/soil (3)

(*v*)

T	**30 °C**
	100 °C

(3)

Chemistry (130 MARKS)

Question 4 (52)

(*a*) (*i*) carbon dioxide (accept CO_2) (3)

(*ii*)

T	**Limewater turns milky**
	Limewater turns green

(3)

(*b*)

S	**Has a fixed shape**
	No fixed shape
S	**Has a fixed volume**
	No fixed volume

(3)

(3)

(*c*) chlorination // filtration (2 × 3)

(*d*) (*i*) Bunsen burner / hot plate (3)

(*ii*) water (3)

(*e*) (*i*) one **W** placed correctly (3)

W	**Anhydrous Copper sulfate**
	Calcium carbonate
	Cobalt chloride

or

	Anhydrous Copper sulfate
	Calcium carbonate
W	**Cobalt chloride**

(*ii*) blue / pink (red) (must match chemical selected) (3)

(*f*) (*i*) more dense (3)

(*ii*) fizzy drinks / fire extinguisher / photosynthesis / refrigeration / dry ice / stage effects (3)

(*g*) (*i*) P – positive

E	**Negative**
	Neutral
P	**Positive**

(3)

(*ii*) E – negative (3)

(*h*) **Award 6m for first correct answer and 2m for each subsequent correct answer.**

(*i*) hydrogen // oxygen

(*ii*) covalent

Question 5 (39)

(*a*) (*i*) bronze (3)

(*ii*) statues / ornaments / medals / coins / any valid use (3)

(*iii*) mixture (3)

(*b*) **Award 6m for first correct answer and 3m for each subsequent correct answer.**

(*i*) chromatography

(*ii*) water / alcohol / any named alcohol

(*iii*) to stop the ink dissolving in the liquid

(*iv*) B

more than one spot can be seen above the ink spot / separation of colours

(*c*) **State or show** (4 × 3)

[Marks awarded in the context of a valid experiment.]

Candle	**Gas Syringe**	**Steel wool**
candle	copper	steel wool
trapped volume of air	trapped volume of air	trapped volume of air
burn candle	heat copper	steel wool rusts
note change in volume of air	note change in volume of air	note change in volume of air

[Diagram must have at least ***one*** label. No labelled diagram – deduct 3 marks]

Question 6 (39)

(*a*) **Award 6m for first correct answer and 3m for each subsequent correct answer.**

(*i*) burette

(*ii*) to show when neutralisation has taken place / to show when salt is made / to show when enough acid is added

(*iii*) **A** - hydrochloric acid

B - sodium hydroxide

A	**Hydrochloric acid**
	Sulfuric acid
B	**Sodium Hydroxide**
	Calcium carbonate

(*iv*) evaporation

(*b*) (*i*) black (3)

(*ii*) substance that speeds up a chemical reaction (3)

(*iii*) hydrogen peroxide (accept H_2O_2) (3)

(*iv*) relights // glowing splint (2 × 3)

(*v*) bright / white / hot (3)

	The colour changes from blue to red
E	**The colour changes from red to blue**

(3)

Physics (130 MARKS)

Question 7 (52)

(*a*) first **correct** line (3)

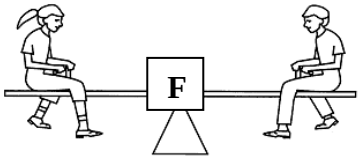
second **correct** line (3)

(*b*) (*i*) **W** – 100 (3)

(*ii*) **X** – Joules (3)

	4
W	**100**
	Watts
X	**Joules**

(*c*) (*i*) **F** at centre of see-saw (3)



(*ii*) any one correct example e.g. scissors / crowbar / etc (3)

(*d*) (*i*) sound reduces (3)

(*ii*) sound needs a medium to travel / sound cannot travel through a vacuum (3)

(*e*) (*i*) increases (3)

(*ii*) decreases (3)

(*f*) heat the ball // no longer fits through

or

heat the ring // the ball fits through (2 × 3)

(*g*) (*i*) decreases (3)

(*ii*) decreases (3)

(*h*) **Award 6m for first correct answer and 2m for each subsequent correct answer.**

(*i*) liquid // gas

(*ii*) A

Question 8 (39)

(*a*) (*i*) graduated (measuring) cylinder / pipette / burette / syringe (3)

(*ii*) 8 (3)

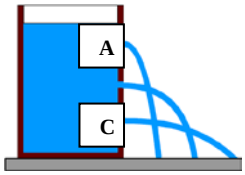
(*iii*) cm^3 (3)

(*iv*) (3)

	The volume of the ice cube is less than the volume of the liquid water
	The volume of the ice cube is the same as the volume of the liquid water
V	**The volume of the ice cube is greater than the volume of the liquid water**

(*b*) (*i*) correct line from A (3)

correct line from C (3)



(*ii*) increases (3)

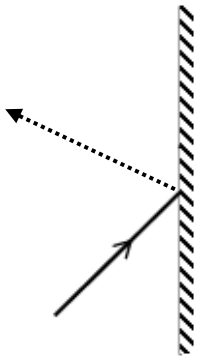
(*c*) **Award 6m for first correct answer and 3m for each subsequent correct answer.**

(*i*) radiation

(*ii*) light travels in straight lines / the object blocks the light

(*iii*) light bounces back

(*iv*)



(*v*) any one correct example

Question 9 (39)

(*a*) (*i*) in series (3)

(*ii*) it will go out (3)

(*iii*) d.c. (3)

(*b*) (*i*) heat (3)

(*ii*) safety / limit the current / protection / prevent overload / prevent fire (3)

(*iii*) 6 (3)

(*iv*) 108c *or* €1.08 (3)

(*c*) (*i*) move the lamp / use a dimmer switch / change the light bulb /cover LDR (3)

(*ii*) ohmmeter / multimeter (3)

(*iii*) resistance decreases (3)

(*iv*) street lighting / light meters / cameras /any valid use (3)

(*d*) (*i*) rubbed (3)

(*ii*) earthed (3)

Marking Criteria for Coursework B (OL) - BIOLOGY

	Guide to mark assignment	
Total Marks	Investigate and compare the quantitative effects of changing (a) wavelength of illumination and (b) either intensity or duration of illumination on the phototropic growth response of recently germinated plant shoots/seedlings.	**Mark Assignment**
5	**<u>Introduction to the investigation</u>** **1 (i) Statement/identification of problem/topic to be investigated** **1 (ii) Background research** *Any <u>one</u> reference to book or internet or person consulted or evidence of research*	 (2) (3)
20	**<u>Preparation and planning</u>** **2 (i) Identify any relevant variables and necessary controls** *Identify any <u>three</u> variables and/or indicate how some of these need to be controlled or held fixed* *Key variables* • wavelength (frequency/colour) of light • intensity (*or* distance from source to plant) *or* duration of illumination • factor indicative of growth response (e.g. length, angle) *Other variables* • duration of illumination *or* intensity (*or* distance from source to plant) • type of plant • temperature • type of growth media • water content of growth media • thickness of light filters • number of seedlings • background light **2 (ii) List of the equipment needed for the investigation** *Identify any <u>five</u> pieces of equipment pertinent to procedure* **2 (iii) List of tasks to be carried out during the investigation** *Identify any <u>three</u> tasks carried out in investigation* • procure seeds/seedlings and/or growth media and/or lights/filters • plant and/or water seeds/seedlings • shine light • measure factor indicative of growth response • record/graph data • repeat for other wavelength(s) • repeat for other intensity *or* duration of illumination	 (4 + 4 + 2) (5 × 1) (2 + 2 + 1)

20	**<u>Procedure, Apparatus, Safety, Data Collection/Observations</u>** **3 (i) Safety precautions** *Identify any <u>two</u> specific safety precautions followed* **3 (ii) & (iii) Procedure followed in the investigation** *(state or show)* *Identify any <u>seven</u> steps taken in conducting investigation* • prepare/water growth media • plant seeds/seedlings • measure factor indicative of growth response (*before* illumination) • turn on light source • measure/note wavelength/frequency/colour of light source • measure/note intensity (power) of light source • measure/note distance of light source from plants • leave for a period of time • measure factor indicative of growth response (*after* illumination) • clean/dry equipment for reuse • repeat for same wavelength and intensity/duration (to verify data) • repeat for different wavelength • repeat for different intensity/duration • record/graph data **3 (iv) Recorded Data / Observations** *Identify <u>two</u> data sets* • effect of changing wavelength (for fixed intensity/duration) • effect of changing intensity/duration (for fixed wavelength)	(3 + 2) (3 × 2) + (4 × 1) (3 + 2)
20	**<u>Analysis</u>** **4 (i) Calculations / Data analysis** *Relevant analysis of data or calculations or graph(s)* • Limited manipulation/presentation of data • Good manipulation/presentation of data • Excellent manipulation/presentation of data **4 (ii) Conclusion(s) and Evaluation of Result(s)** *Relevant conclusion(s) drawn and evaluation of result(s)* • Limited treatment • Good treatment • Excellent treatment	(4) (7) (10) (4) (7) (10)
10	**<u>Comments</u>** *Any <u>two</u> comments on refinement or extension or source of error etc.* • Good comprehension • Excellent comprehension	(3) (5) } × 2

Marking Criteria for Coursework B (OL) - CHEMISTRY

	Guide to mark assignment	
Total Marks	Investigate and compare the quantitative effects of changing (a) metal types and (b) fruit/vegetable type on the emf (voltage) produced across two different metals, when the electrolytes take the form of fruits and/or vegetables.	**Mark Assignment**
5	**<u>Introduction to the investigation</u>** **1 (i) Statement/identification of problem/topic to be investigated** **1 (ii) Background research** *Any <u>one</u> reference to book or internet or person consulted or evidence of research*	 (2) (3)
20	**<u>Preparation and planning</u>** **2 (i) Identify any relevant variables and necessary controls** *Identify any <u>three</u> variables and/or indicate how some of these need to be controlled or held fixed* *Key variables* • metal types • fruit/vegetable type • (factor indicative of) emf/voltage *Other variables* • mass/volume of metal • area/length of metal (in contact with electrolyte) • temperature • type/length of connecting wires in circuit • distance between electrodes • mass of fruit/vegetable • "ripeness" (*or* similar) of fruit/vegetable • number of cells in battery **2 (ii) List of the equipment needed for the investigation** *Identify any <u>five</u> pieces of equipment pertinent to procedure* **2 (iii) List of tasks to be carried out during the investigation** *Identify any <u>three</u> tasks carried out in investigation* • procure fruit/vegetables and/or metals • place electrodes in fruit/vegetable • connect electrodes across meter *or* set meter to read voltage • measure emf/voltage • record/graph data • repeat for other metal types • repeat for other fruit/vegetables	(4 + 4 + 2) (5 × 1) (2 + 2 + 1)

20	**<u>Procedure, Apparatus, Safety, Data Collection/Observations</u>** **3 (i) Safety precautions** *Identify any <u>two</u> specific safety precautions followed* **3 (ii) & (iii) Procedure followed in the investigation** *(state or show)* *Identify any <u>seven</u> steps taken in conducting investigation* • prepare fruit/vegetables • prepare metals • measure/note mass/volume of metals • insert metals into fruit/vegetable • measure/note area/length of metal (in contact with electrolyte) • measure/note distance between electrodes • set voltmeter/multimeter to appropriate scale • connect voltmeter/multimeter across electrodes • measure emf/voltage • clean/dry equipment for reuse • repeat for same fruit/vegetable and metal types (to verify data) • repeat for different metal types • repeat for different fruit/vegetables • record/graph data **3 (iv) Recorded Data / Observations** *Identify <u>two</u> data sets* • effect of changing metal types (for fixed fruit/vegetable) • effect of changing fruit/vegetable (for fixed metal types)	(3 + 2) (3 × 2) + (4 × 1) (3 + 2)
20	**<u>Analysis</u>** **4 (i) Calculations / Data analysis** *Relevant analysis of data or calculations or graph(s)* • Limited manipulation/presentation of data • Good manipulation/presentation of data • Excellent manipulation/presentation of data **4 (ii) Conclusion(s) and Evaluation of Result(s)** *Relevant conclusion(s) drawn and evaluation of result(s)* • Limited treatment • Good treatment • Excellent treatment	(4) (7) (10) (4) (7) (10)
10	**<u>Comments</u>** *Any <u>two</u> comments on refinement or extension or source of error etc.* • Good comprehension • Excellent comprehension	(3) (5) } × 2

Marking Criteria for Coursework B (OL) - PHYSICS

	Guide to mark assignment	
Total Marks	Investigate and compare the quantitative effects of changing (a) material type and (b) material thickness on the level of sound insulation provided by a range of materials.	**Mark Assignment**
5	**<u>Introduction to the investigation</u>** **1 (i) Statement/identification of problem/topic to be investigated** **1 (ii) Background research** *Any <u>one</u> reference to book or internet or person consulted or evidence of research*	 (2) (3)
20	**<u>Preparation and planning</u>** **2 (i) Identify any relevant variables and necessary controls** *Identify any <u>three</u> variables and/or indicate how some of these need to be controlled or held fixed* *Key variables* • material type • material thickness (*or* number of layers) • intensity/loudness of sound recorded *Other variables* • intensity/loudness of sound emitted • frequency/wavelength of sound emitted • distance between source and sound level meter • distance between source and insulation • temperature • intensity/loudness of background sound • mass/volume of insulating material • shape/dimensions of laboratory (“acoustics”/ “echoes” etc.) **2 (ii) List of the equipment needed for the investigation** *Identify any <u>five</u> pieces of equipment pertinent to procedure* **2 (iii) List of tasks to be carried out during the investigation** *Identify any <u>three</u> tasks carried out in investigation* • procure source of sound and/or insulating materials and/or sound level meter • position insulating material • produce sound • measure factor indicative of sound intensity level • record/graph data • repeat for other material types • repeat for other material thicknesses (or number of layers)	 (4 + 4 + 2) (5 × 1) (2 + 2 + 1)

20	**<u>Procedure, Apparatus, Safety, Data Collection/Observations</u>** **3 (i) Safety precautions** *Identify any <u>two</u> specific safety precautions followed* **3 (ii) & (iii) Procedure followed in the investigation** *(state or show)* *Identify any <u>seven</u> steps taken in conducting investigation* • prepare source of sound • prepare insulating materials • prepare suitable environment/housing • measure/note mass/volume of insulating material • measure/note thickness (or number of layers) of insulating material • turn on sound level meter and/or set to appropriate scale • measure/note distance of sound source from sound level meter • measure/note intensity/loudness of emitted sound • measure/note intensity/loudness of background sound • measure intensity/loudness of detected sound • repeat for same material type and material thickness (to verify data) • repeat for different material types • repeat for different material thicknesses (or number of layers) • record/graph data **3 (iv) Recorded Data / Observations** *Identify <u>two</u> data sets* • effect of changing material types (for fixed material thickness) • effect of changing thickness (for fixed material type)	(3 + 2) (3 × 2) + (4 × 1) (3 + 2)
20	**<u>Analysis</u>** **4 (i) Calculations / Data analysis** *Relevant analysis of data or calculations or graph(s)* • Limited manipulation/presentation of data • Good manipulation/presentation of data • Excellent manipulation/presentation of data **4 (ii) Conclusion(s) and Evaluation of Result(s)** *Relevant conclusion(s) drawn and evaluation of result(s)* • Limited treatment • Good treatment • Excellent treatment	(4) (7) (10) (4) (7) (10)
10	**<u>Comments</u>** *Any <u>two</u> comments on refinement or extension or source of error etc.* • Good comprehension • Excellent comprehension	(3) (5) } × 2

Marking Criteria for Coursework B (OL) – OWN INVESTIGATION

10	**Introduction to the investigation** **1 (i) Statement/identification of problem/topic to be investigated** • Limited treatment • Good treatment • Excellent treatment **1 (ii) Background research** *Any two references to book or internet or person consulted or evidence of research*	 (2) (4) (6) (2 + 2)
40	**Preparation and planning** **2 (i) Identify any relevant variables and necessary controls** *Identify five variables (two compulsory variables – which refer to the investigation title – and any three other variables) and/or indicate how some of these need to be controlled or held fixed* [If variables/controls not relevant to the type of investigation undertaken allow 6 marks for stating so, then readjust equipment to (8 × 2) and tasks to (6 × 3)] **2 (ii) List of the equipment needed for the investigation** *Identify any eight pieces of equipment pertinent to procedure* **2 (iii) List of tasks to be carried out during the investigation** *Identify any six tasks carried out in investigation*	 (5 × 4) (8 × 1) (6 × 2)
40	**Procedure, Apparatus, Safety, Data Collection/Observations** **3 (i) Safety precautions** *Identify any four specific safety precautions followed* **3 (ii) & (iii) Procedure followed in the investigation** *(state or show)* *Identify any twelve steps taken in conducting investigation* **3 (iv) Recorded Data / Observations** *Identify eight data points*	 (4 × 2) (4 × 3) + (4 × 2) + (4 × 1) (8 × 1)
40	**Analysis** **4 (i) Calculations / Data analysis** *Two relevant analyses of data or calculations or graph(s)* • Limited manipulation/presentation of data • Good manipulation/presentation of data • Excellent manipulation/presentation of data **4 (ii) Conclusion(s) and Evaluation of Result(s)** *Two relevant conclusions drawn and evaluation of results* • Limited treatment • Good treatment • Excellent treatment	 (4) (7) (10) } × 2 (4) (7) (10) } × 2
20	**Comments** *Any four comments on refinement or extension or source of error etc.* • Good comprehension • Excellent comprehension	 (3) (5) } × 4