SimpleStudy

PRACTICE MARKING SCHEME

LEAVING CERTIFICATE · ORDINARY LEVEL · SAMPLE PAPER 2 · 2027

Climate Action and Sustainable Development

Total marks	Duration	Sections
300	2h 30m	A · B · C

About this document

A practice marking scheme produced by SimpleStudy to help students and teachers prepare for the Leaving Certificate examination in Climate Action and Sustainable Development.

Not an official State Examinations Commission document.

Marking Scheme

This marking scheme accompanies SimpleStudy's Sample Paper 2 in Climate Action and Sustainable Development at Ordinary Level. It is intended to support candidates and teachers preparing for the Leaving Certificate examination in this subject. It is not an official State Examinations Commission document.

General Marking Guidelines

- Accept all reasonable responses not explicitly listed in this scheme.
- Award marks for relevant content even if poorly expressed.
- Do not penalise for poor spelling or grammar unless meaning is unclear.
- Where a candidate contradicts themselves, award the lower mark.
- A named example is required where specified - no marks without one.
- For graphs and diagrams: credit accuracy, labelling, and appropriate choice.
- Award marks for each correct selection in tick-box questions; do not penalise for incorrect additional selections beyond not awarding marks for them.

Paper Structure

Section A	**100 marks**	There is one question in this section, answer all parts of this question.
Section B	**160 marks**	Answer any four of Questions 2-6 in this section. Each question carries 40 marks.
Section C	**40 marks**	Answer one of Question 7 or 8 in this section. Each question carries 40 marks.

Grading Descriptors (extended answers and Section C)

High (H)	Accurate, well-developed, specific and relevant.
Mid (M)	Mostly accurate, some development, relevant.
Low (L)	Partially accurate, limited development, broadly relevant.

Section A — 100 marks

There is one question in this section, answer **all** parts of this question.

Question 1 (100 marks) - Answer ALL parts

(a) Greenhouse gases and the enhanced greenhouse effect. *(16 marks)*

(a)(i) Which three are greenhouse gases? *(6 marks - 2 per correct selection)*

Award 2 marks per correct selection x 3 = 6 marks.

Part	Acceptable Answer(s)	Marks
Correct x3	**Carbon Dioxide (CO_2)** - primary greenhouse gas from fossil fuel combustion. **Methane (CH_4)** - released from livestock, rice paddies, landfill, and natural gas leaks. **Nitrous Oxide (N_2O)** - released from agriculture (fertilisers, manure) and combustion. *Do NOT accept:* Oxygen (not a greenhouse gas); Helium (inert noble gas).	**2 + 2 + 2**

(a)(ii) and (a)(iii) True or False. *(4 marks - 2 each)*

Part	Acceptable Answer(s)	Marks
(a)(ii) ***2 marks***	**TRUE** Deforestation is a human-caused driver of the enhanced greenhouse effect. Trees absorb CO_2 through photosynthesis; cutting them down releases stored carbon and removes future absorption capacity, increasing atmospheric CO_2.	**2**
(a)(iii) ***2 marks***	**FALSE** Atmospheric greenhouse gas levels are in fact an excellent indicator of human-induced global warming. Rising concentrations of CO_2, methane, and nitrous oxide - measured directly (e.g. Keeling Curve) and from ice cores - show clear correlation with industrialisation.	**2**

(b) Which two are NGOs? *(8 marks - 4 per correct selection)*

> *An NGO (Non-Governmental Organisation) is independent of government - not funded or controlled by the state.*

Part	Acceptable Answer(s)	Marks
Correct x2	**WWF (World Wildlife Fund for Nature)** - independent international environmental organisation; not part of any government. **Greenpeace** - independent international environmental organisation; explicitly non-governmental. *Do NOT accept:* Department of the Environment, Climate and Communications (Irish government department); UN Food and Agriculture Organisation (UN agency).	**4 + 4**

(c) True or False. *(10 marks - 2 per statement)*

Part	Acceptable Answer(s)	Marks
(i) ***2 marks***	**TRUE** The Anthropocene is the proposed geological epoch in which human activity has become the dominant influence on Earth's climate, atmosphere, and ecosystems - beginning approximately with industrialisation.	**2**
(ii) ***2 marks***	**TRUE** Peat bogs are natural carbon sinks - waterlogged, anaerobic conditions slow decomposition, causing organic matter to accumulate as peat over thousands of years. Healthy bogs absorb more CO_2 than they release.	**2**
(iii) ***2 marks***	**TRUE** This is the classic Brundtland Commission (1987) definition of sustainable development: meeting the needs of the present without compromising the ability of future generations to meet their own needs.	**2**
(iv) ***2 marks***	**FALSE** The description given describes **transpiration**, not precipitation. Precipitation is the process by which water falls from the atmosphere to the Earth's surface in the form of rain, snow, sleet, or hail.	**2**
(v) ***2 marks***	**FALSE** Collective action is generally more effective than individual action at achieving systemic change. Individual actions can reduce personal carbon footprints but cannot by themselves change the structures, policies, and systems that drive climate change. Collective action - through social movements, policy advocacy, community organising, and political pressure - creates the systemic shifts needed.	**2**

(d) Global North and Global South - Figure 1. *(16 marks)*

Part	Acceptable Answer(s)	Marks
(d)(i) ***4 marks***	**Global North** X is shown in the northern hemisphere of the map, covering regions such as North America, Europe, and northern Asia - the wealthier, industrialised nations of the Global North.	**4**
(d)(ii) ***4 marks (2+2)***	Any ONE valid country from each group: **Global North:** Ireland / USA / UK / Germany / France / Canada / Australia / Japan / any wealthy industrialised nation. **Global South:** Bangladesh / India / Kenya / Nigeria / Brazil / Tuvalu / Kiribati / Pakistan / any developing or climate-vulnerable nation.	**2 + 2**
(d)(iii) ***8 marks (4+4)***	Any ONE named climate justice movement from each: **Global North movement (4 marks):** • Fridays for Future (Sweden / global) • Extinction Rebellion (UK) • Just Stop Oil (UK) • Sunrise Movement (USA) • Climate Justice Coalition (Ireland) **Global South movement (4 marks):** • Pacific Climate Warriors • La Via Campesina (Global South farmers) • Standing Rock Sioux water protectors • MOSOP / Ogoni people (Nigeria)	**4 + 4**

(e) Natural factors that have influenced Earth's climate. *(12 marks)*

(e)(i) Match each image to the natural factor. *(8 marks - 2 per match)*

Part	Acceptable Answer(s)	Marks
Tectonic plate activity	The image showing a **volcanic eruption** - volcanic activity is driven by tectonic plate movements. Eruptions release CO_2 and aerosols that influence climate.	**2**
Changes in Earth's orbit	The image showing **Earth's spin, tilt, or orbital path** - Milankovitch cycles alter how solar energy is distributed across Earth, driving glacial cycles.	**2**
Evolution of life	The image showing **human evolution / early life** - the evolution of photosynthetic organisms (algae, plants) fundamentally changed Earth's atmosphere by producing oxygen and absorbing CO_2.	**2**
Formation of fossil fuels	The image showing **fossilisation / geological layers** - the burial and compression of organic matter over millions of years formed coal, oil, and gas, locking carbon away.	**2**

(e)(ii) Tectonic plate activity occurs in which Earth system? *(4 marks)*

Part	Acceptable Answer(s)	Marks
4 marks	**Geosphere** Tectonic plate activity - the movement of the Earth's lithospheric plates - occurs in the geosphere (the solid Earth, including crust, mantle, and core).	**4**

(f) Match each term to its description. *(10 marks - 2 per match)*

Part	Acceptable Answer(s)	Marks
Bioeconomy	**Using renewable biological resources from land and sea to produce food, materials and energy.** Uses living organisms and biological processes for sustainable economic activity.	**2**
Data	**Measurements or statistics collected for research.** The raw information gathered through observation, measurement, or survey used as evidence.	**2**
Degrowth	**Involves shrinking rather than growing economies so that less of the world's dwindling resources are used.** Challenges the assumption that economic growth is always desirable or necessary.	**2**
Global Warming	**Long-term increase in the Earth's average temperature.** The observed rise in average surface temperatures driven primarily by greenhouse gas accumulation.	**2**
Capitalism	**When trade and industry are controlled by private owners for profit.** An economic system based on private ownership of the means of production and market-based allocation of goods and services.	**2**

(g) Misinformation, Disinformation and Greenwashing. *(8 marks)*

Part	Acceptable Answer(s)	Marks
(g)(i) ***4 marks***	**Disinformation** The definition describes information that is intentionally spread with the purpose of deceiving people - the key characteristic of disinformation. Misinformation is false or misleading information spread without necessarily intending to deceive.	**4**
(g)(ii) ***4 marks***	**Greenwashing** is when a company or organisation makes misleading or exaggerated claims about the environmental benefits of its products, services, or practices in order to appear more environmentally responsible than it actually is. *e.g.* A fossil fuel company advertising itself as a clean energy leader while continuing to expand oil and gas extraction; a clothing brand labelling a product eco-friendly based on minor changes while overall production remains highly polluting.	**4**

(h) Environmental indicators infographic - Figure 2. *(16 marks)*

Part	Acceptable Answer(s)	Marks
(h)(i) ***4 marks***	**Increasing** The infographic shows global population rising from 1950 to 2021 - from approximately 2.5 billion to nearly 8 billion.	**4**
(h)(ii) ***4 marks***	**Higher** Ireland's CO_2 equivalent per capita was higher than the EU27 average in 2021. Ireland has one of the highest per-capita emissions in the EU, largely due to agriculture (methane and nitrous oxide from livestock) and relatively high car dependency.	**4**
(h)(iii) ***4 marks***	**Calculation:** 100% - renewable % = non-renewable % Based on the CSO Environmental Indicators Ireland 2023 source: Ireland generated approximately 36% of electricity from renewable sources in 2022, meaning approximately **64%** came from non-renewable sources. Award 2 marks for correct method + 2 marks for correct answer consistent with the figure shown.	**4**
(h)(iv) ***4 marks (2+2)***	Any ONE correctly named renewable and one non-renewable source: **Renewable:** Wind / Solar / Hydropower / Wave / Tidal / Geothermal / Biomass / Biogas **Non-renewable:** Natural gas / Coal / Oil / Peat / Nuclear (debated case).	**2 + 2**

(i) Which two are most reliable for research? *(8 marks - 4 per correct selection)*

Part	Acceptable Answer(s)	Marks
Correct x2	**From a reputable source** - information from established, credible organisations is more likely to be accurate and reliable. **Makes reference to evidence** - information that cites data or research allows the reader to check the claims and assess credibility. *Do NOT accept:* Contains bias (less reliable); Cannot be verified (unreliable).	**4 + 4**

(j) Impacts of climate change - photographs A-D. *(14 marks)*

(j)(i) Match each photograph to the climate change impact. *(8 marks - 2 per match)*

Part	Acceptable Answer(s)	Marks
Glaciers melting at a quicker rate	Image showing **melting glaciers / ice sheets** - likely image B (NASA glacier image). Glaciers are retreating worldwide as average temperatures rise.	**2**
Increase in number of wildfires	Image showing a **wildfire / forest fire** - likely image A. Higher temperatures and prolonged droughts increase the frequency and intensity of wildfires.	**2**
Desertification	Image showing **dry, cracked, barren land** - likely image D. Desertification is the process by which fertile land becomes desert, accelerated by climate change and drought.	**2**
Increased frequency of storms	Image showing a **hurricane / tropical storm from above** - likely image C. Warmer ocean temperatures provide more energy for tropical storms.	**2**

(j)(ii) Which impact relates to the cryosphere? *(6 marks)*

Part	Acceptable Answer(s)	Marks
6 marks	**Glaciers are melting at a quicker rate** The cryosphere comprises all frozen water on Earth - ice sheets, glaciers, sea ice, permafrost, and snow cover. Other options relate to different Earth systems: • Wildfires - biosphere • Desertification - geosphere / biosphere • Increased storms - atmosphere / hydrosphere	**6**

Section B — 160 marks

Each question carries 40 marks. Candidates answer all parts of their chosen four questions.

Question 2 - Climate Beliefs, Biodiversity and Evidence (40 marks)

(a) Climate change beliefs infographic - Figure 3. *(8 marks)*

Part	Acceptable Answer(s)	Marks
(a)(i) ***4 marks***	**94%** According to Figure 3 (sourced from the EPA 2021 survey), 94% of Irish people trust scientists as a source of information about climate change.	**4**
(a)(ii) ***4 marks***	Figure 3 states that 96% of Irish people think climate change is happening. **100% - 96% = 4%** Therefore 4% of people do not think climate change is happening.	**4**

(b) Two ways climate change is affecting people - Figure 4. *(12 marks - 6 each)*

Part	Acceptable Answer(s)	Marks
Way 1 ***6 marks***	Any clearly described way climate change affects people, e.g.: **Food insecurity:** More frequent droughts and floods destroy crops and reduce agricultural yields, reducing food availability and increasing food prices. **Displacement and migration:** Sea-level rise, flooding, and extreme weather force communities from their homes, creating climate refugees. **Health impacts:** Heatwaves cause heat-related illness and death; changing disease patterns - spread of mosquito-borne diseases to new regions.	**3 + 3**
Way 2 ***6 marks***	A second, distinct impact from the above with a clear explanation.	**3 + 3**

(c) How non-native invasive species can impact biodiversity. *(10 marks)*

Part	Acceptable Answer(s)	Marks
10 marks	**Definition:** Non-native (or alien) invasive species are plants or animals introduced - accidentally or deliberately - into an ecosystem where they do not naturally occur, and where they spread rapidly and cause harm. **How they impact biodiversity:** • **Competition:** Invasive species compete with native species for food, habitat, light, or space - often outcompeting them. • **Predation:** Invasive predators can devastate native prey populations with no evolved defences (e.g. American mink preying on ground-nesting birds). • **Habitat alteration:** Some invasive species change habitat structure - Rhododendron ponticum forms dense thickets that block light to the forest floor. • **Disease transmission:** Invasive species can introduce new diseases. **Example:** Grey squirrel (Ireland) - outcompetes red squirrel; carries and transmits squirrelpox virus, lethal to red squirrels.	**10**

(d) How temperature change and changes in precipitation are used as evidence for climate change. *(10 marks - 5 each)*

Part	Acceptable Answer(s)	Marks
Temperature change over time ***5 marks***	Long-term temperature records show a clear upward trend in global average surface temperatures since the mid-19th century, coinciding with industrialisation. **Key evidence:** • Global average temperature has risen by ~1.1-1.2C above pre-industrial levels by 2024. • The ten hottest years on record have all occurred since 2010. • Pattern of warming - greater at the poles - is consistent with greenhouse gas forcing rather than solar variability.	**5**
Changes in precipitation ***5 marks***	Climate change is altering global precipitation patterns - amount, distribution, intensity. **Key evidence:** • Increased rainfall and intense downpours in some regions (Ireland, northern Europe) while others (Mediterranean, sub-Saharan Africa) have more frequent droughts. • More intense rainfall consistent with a warmer atmosphere holding more water vapour (~7% more per 1C - Clausius-Clapeyron). • Patterns observed match predictions of climate models driven by GHG increases.	**5**

Question 3 - Lifestyle, SDGs and Climate Action Research (40 marks)

(a) Lifestyle choices and carbon emissions - Figure 5. *(4 marks)*

Part	Acceptable Answer(s)	Marks
4 marks	**Having one fewer child** (or equivalent phrasing). According to Figure 5, having one fewer child is by far the highest-impact lifestyle change for reducing carbon emissions - approximately 58.6 tonnes of CO_2 equivalent per year.	**4**

(b) Choose one lifestyle choice and explain briefly how it reduces carbon emissions. *(10 marks)*

Part	Acceptable Answer(s)	Marks
10 marks (2+8)	**Living car-free (2+8):** Eliminating personal car use removes direct emissions from petrol or diesel. Living car-free can save approximately 2.4 tonnes of CO_2 per year. **Eating a plant-based diet (2+8):** Animal agriculture - particularly beef and dairy - produces large amounts of methane and nitrous oxide. Switching to plant-based eliminates these emissions. **Avoiding one transatlantic flight (2+8):** A single long-haul flight can produce more CO_2 per passenger than months of driving. **Buying green energy (2+8):** Switching to a renewable supplier means electricity is generated from wind, solar, or other renewables rather than fossil fuels.	**2 + 8**

(c) The Sustainable Development Goals (SDGs). *(10 marks)*

Part	Acceptable Answer(s)	Marks
(c)(i) ***4 marks***	**The Millennium Development Goals (MDGs)** Adopted by the UN in 2000 and ran until 2015. Focused on eight goals including reducing extreme poverty, improving child health, and combating HIV/AIDS. The SDGs (2015-2030) succeeded and expanded on the MDGs.	**4**
(c)(ii) ***6 marks***	The SDGs are a universal set of **17 goals and 169 targets** adopted by all 193 UN member states in 2015 as part of the 2030 Agenda for Sustainable Development. **Aims:** • End poverty and hunger in all forms, everywhere. • Protect the planet from degradation - climate, ocean health, biodiversity. • Ensure prosperous and fulfilling lives - health, education, equality. • Foster peaceful and inclusive societies and accountable institutions. • Forge a global partnership for sustainable development.	**6**

(d) Climate / sustainability action researched - applied learning. *(16 marks)*

Part	Acceptable Answer(s)	Marks
(d)(i) ***4 marks (2+2)***	Any valid climate or sustainability action studied, e.g.: • Cloughjordan Ecovillage - issue: community energy insecurity • Tidy Towns biodiversity initiative - issue: loss of pollinators • School solar panel installation - issue: school's carbon footprint • Community garden - issue: food sustainability and waste reduction • Fridays for Future campaign - issue: insufficient government action • Deposit Return Scheme - issue: plastic packaging waste	**2 + 2**
(d)(ii) ***12 marks (2+10)***	Award marks for: stating whether the action was effective (2) + explaining factors that affected effectiveness (10). **Factors that might affect effectiveness:** • **Scale:** Was the action large enough to make a measurable difference? • **Participation:** Did enough people get involved? • **Resources:** Did the action have sufficient funding, time, expertise? • **Communication:** Was the action well-publicised? • **Policy support:** Was the action backed by legislation or policy? • **Measurement:** Were outcomes tracked and evaluated?	**2 + 10**

Question 4 - Climate Performance, Adaptation and Policy (40 marks)

(a) Climate protection performance map - Figure 6. *(20 marks)*

Part	Acceptable Answer(s)	Marks
(a)(i) ***4 marks***	**High** According to Figure 6, Portugal was classified as High for its climate protection performance, reflecting strong progress in renewable energy and relatively low per-capita emissions.	**4**
(a)(ii) ***6 marks***	Any ONE clearly explained reason why no country achieved Very High classification: • **Gap between targets and action:** Even highest-performing countries have set targets that are not yet being met in practice. • **Fossil fuel dependency:** All countries still rely on some fossil fuels. • **Per-capita emissions still too high:** Even in low-emission countries, per-capita consumption remains well above what is sustainable globally.	**6**
(a)(iii) ***6 marks***	Using map evidence to assess Ireland's performance relative to other European countries. **Ireland did NOT perform well** compared to many European peers: *Evidence:* Ireland is likely classified as Medium or Low while countries such as Denmark, Sweden, Portugal, and the UK received higher classifications. Ireland's high agriculture-related emissions (methane, nitrous oxide) and historically high per-capita emissions contribute to weaker performance.	**6**
(a)(iv) ***4 marks***	Award marks for a clear answer (yes/no) supported by reasoning: **YES - effective:** Maps allow quick comparison at a glance. Colour-coding makes it easy to see performance without reading detailed data. Accessible to general audiences. **NO - limitations:** Maps compress complex data (four indicators) into a single classification, losing nuance. Colour-blindness affects accessibility. Does not show trends over time.	**4**

(b) Innovative community adapting to climate change. *(10 marks)*

Part	Acceptable Answer(s)	Marks
10 marks (2+8)	**Irish examples:** **Cloughjordan Ecovillage, Co. Tipperary:** Adapting to energy insecurity through a community district heating system, energy co-operative, and sustainable low-carbon housing. **Westport, Co. Mayo:** Adapting to increased coastal flooding through flood defences and community early-warning systems. **Global South examples:** **Maldives:** Adapting to sea-level rise through land reclamation, artificial islands (Hulhumale), planning for managed relocation. **Bangladesh - floating gardens:** Communities in flood-prone areas grow food on floating beds of water hyacinth and bamboo.	**2 + 8**

(c) National environmental policy - aims and progress. *(10 marks)*

Part	Acceptable Answer(s)	Marks
10 marks (2+4+4)	**Climate Action Plan 2023:** *Aims:* 51% reduction in GHG emissions by 2030; net-zero by 2050; sectoral carbon budgets; 500,000 EVs by 2030; 80% renewable electricity by 2030. *Progress:* Renewable electricity over 35% by 2023, but transport and agriculture emissions remain stubbornly high. Behind 2030 targets in several sectors. **Deposit Return Scheme (2024):** *Aims:* Reduce plastic and aluminium can litter; increase recycling rates. *Progress:* 300 million containers returned by mid-2024 - widely regarded as effective. **ACRES (Agri-Climate Rural Environment Scheme):** *Aims:* Pay farmers for environmentally beneficial land management. *Progress:* Large uptake (50,000+ farmers in 2023); too early to fully assess outcomes.	**2 + 4 + 4**

Question 5 - Waste, Circular Economy, Renewable Energy and Decarbonisation (40 marks)

(a) Non-metallic waste data - bar chart completion. *(20 marks)*

(a)(i) Complete the bar chart. *(12 marks)*

> *Candidates must label the axes and draw bars for Plastic (550 thousand tonnes) and Textiles (250 thousand tonnes).*

Element	Acceptable Answer(s)	Marks
X-axis label	Labelled Type of waste or equivalent (e.g. Material, Waste type).	**2**
Y-axis label	Labelled Weight (in thousand tonnes) or equivalent. Scale must accommodate values up to at least 1,100.	**2**
Plastic bar (550)	Bar drawn to the correct height of 550 thousand tonnes. Award 2 marks if exactly correct; 1 mark if within +/- 25 thousand tonnes.	**4**
Textiles bar (250)	Bar drawn to the correct height of 250 thousand tonnes. Award 2 marks if exactly correct; 1 mark if within reasonable tolerance.	**4**

(a)(ii) Which type had the lowest weight? *(4 marks)*

Part	Acceptable Answer(s)	Marks
4 marks	**Textiles** - with 250 thousand tonnes, textiles had the lowest weight of all five non-metallic waste types listed.	**4**

(a)(iii) Suggest and explain one way to reduce waste. *(4 marks)*

Part	Acceptable Answer(s)	Marks
4 marks (2+2)	Any ONE valid waste reduction suggestion with a clear explanation, e.g.: • **Reduce food waste:** Plan meals, buy only what is needed, store food correctly, use leftovers. Reduces 1,100 thousand tonnes of food waste. • **Repair and reuse clothing:** Repair or donate worn items rather than discarding, reducing 250 thousand tonnes of textile waste. • **Choose products with less packaging:** Buying loose produce reduces plastic waste. • **Composting:** Diverts food and garden waste from landfill. • **Deposit Return Scheme:** Returning plastic bottles and cans for recycling.	**2 + 2**

(b) Two challenges of increasing renewable energy. *(10 marks - 5 each)*

Part	Acceptable Answer(s)	Marks
Challenge 1 ***5 marks***	**Intermittency / variability:** Wind and solar are not available all the time - wind doesn't always blow, sun doesn't always shine. Creates supply gaps that must be covered by backup or storage. Large-scale battery storage is challenging and expensive. **Grid infrastructure:** Ireland's grid was designed for centralised fossil fuel plants; integrating dispersed renewables requires costly grid upgrades. **Planning and community acceptance:** Wind and solar farms often face planning objections - visual impact, noise, property values - slowing renewable rollout. **Cost and investment:** While costs have fallen dramatically, upfront capital is still high.	**5**
Challenge 2 ***5 marks***	A second, distinct challenge from the list above with a clear explanation.	**5**

(c) How carbon sequestration OR increasing water efficiency decarbonises an economy. *(10 marks)*

Part	Acceptable Answer(s)	Marks
Carbon sequestration ***10 marks***	**What it is:** Carbon sequestration captures and stores CO_2 from the atmosphere, preventing it from contributing to the greenhouse effect. **How it decarbonises:** Removing CO_2 already in the atmosphere or capturing it before release reduces the net carbon footprint of economic activity. **Examples:** • **Peatland / bog restoration:** Rewetting drained bogs restores carbon-sink function. • **Afforestation:** Trees absorb CO_2 via photosynthesis, store it in timber and soil. • **Technological CCS:** Carbon Capture and Storage at industrial sites captures CO_2 before atmospheric release.	**6 + 4**
Water efficiency ***10 marks***	**What it is:** Using less water to achieve the same outcomes - reducing wastage in homes, industry, agriculture. **How it decarbonises:** Water treatment, pumping, and heating all require energy - often from fossil fuels. Reducing water demand reduces energy and CO_2 emissions. **Examples:** • **Reducing leakage:** Irish Water has worked to reduce ~40% leakage rates. • **Efficient irrigation:** Drip irrigation and soil sensors reduce pumping energy. • **Low-flow appliances:** Reduce water demand and hot-water heating energy.	**6 + 4**

Question 6 - Circular Economy, Energy and Agriculture (40 marks)

(a) Deposit Return Scheme article. *(10 marks)*

Part	Acceptable Answer(s)	Marks
(a)(i) ***4 marks***	**300 million drinks containers.** The article states: 300 million drinks containers now returned since the scheme launched on 1 February 2024.	**4**
(a)(ii) ***6 marks***	The Re-turn logo communicates the scheme's aim through its visual design: • The name **Re-turn** combines return and the prefix re- (suggesting repetition / recycling) - immediately communicating that containers should be returned. • The logo uses circular design elements, arrows, or recycling motifs that visually represent the circular economy concept. • Appears on containers, making the message visible at point of purchase, reminding consumers to return.	**6**

(b) Two sources of energy used in Ireland. *(4 marks - 2 each)*

Part	Acceptable Answer(s)	Marks
2 sources ***2 marks each***	Any TWO valid energy sources used in Ireland, e.g.: **Renewable:** Wind / Solar / Hydropower / Biomass / Biogas / Wave **Non-renewable:** Natural gas / Oil / Coal / Peat	**2 + 2**

(c) How exploitation of one energy source impacts the environment. *(12 marks)*

Part	Acceptable Answer(s)	Marks
12 marks (2+10)	**Peat / turf extraction:** Draining and cutting bogland destroys a unique wetland habitat, releasing centuries of stored carbon as CO_2 and methane. Specialist bog species (sundew, bog cotton, curlew, hen harrier) lose habitat. Drainage affects water quality in surrounding rivers and lakes. **Oil extraction:** Oil spills contaminate soil, freshwater, and marine ecosystems (e.g. Ogoniland, Nigeria; Deepwater Horizon). Combustion releases CO_2. Flaring of associated gas wastes energy and emits pollutants. **Wind energy:** Generally low impact, but turbines can cause bird and bat mortality; noise and visual impacts; rare-earth magnet manufacturing has mining costs. **Coal mining:** Open-cast mining destroys landscapes; releases methane from coal seams; combustion produces CO_2, SO_2, NOx, and particulates.	**2 + 10**

(d) Regenerative agriculture and just transition in agriculture. *(14 marks)*

Part	Acceptable Answer(s)	Marks
Definition ***6 marks***	Regenerative agriculture is a farming approach that goes beyond simply sustaining existing conditions - it actively works to restore soil health, biodiversity, water cycles, and ecosystem function. A holistic approach that aims to regenerate degraded farmland, sequester carbon in soil, and produce food in ways that improve rather than deplete natural systems. **Key practices:** minimal or no tillage; cover cropping; composting and organic matter addition; agroforestry; rotational grazing; reduction of synthetic pesticides and fertilisers.	**6**
Just transition link ***8 marks***	**How regenerative agriculture contributes to a just transition in Irish agriculture:** • **New income streams for farmers:** Carbon farming and organic certification provide new revenue. • **Reduced input costs:** Less reliance on synthetic fertilisers and pesticides reduces costs, improving financial resilience. • **Environmental stewardship identity:** Reframes farmer's role from polluter to steward - a more positive identity. • **Agri-environment scheme compatibility:** Aligns with ACRES, allowing access to government payments. • **Long-term land viability:** Restoring soil health ensures farmland remains productive for future generations.	**8**

Section C — 40 marks

Answer **one** of Question 7 or Question 8. Each carries 40 marks.

Section C Assessment Criteria

Criterion	Descriptor	Max	Band Marks
Knowledge & Understanding	Accurate, relevant factual content; understanding of key CASD concepts; appropriate use of terminology.	**16**	H: 13-16 M: 8-12 L: 0-7
Analysis & Evaluation	Ability to discuss the topic with some depth; use of evidence; engagement with the question statement.	**14**	H: 11-14 M: 7-10 L: 0-6
Use of Examples	Named, specific, relevant examples used to support points; local and / or global examples.	**6**	H: 5-6 M: 3-4 L: 0-2
Communication	Clarity of expression; logical structure; appropriate register; coherent response.	**4**	H: 3-4 M: 2 L: 0-1

Question 7 - Individual and Collective Action on Climate Injustice (40 marks)

All three bullet points must be addressed. Assess holistically using the four criteria above.

Required Element	Expected Content - High-Band Response
Root causes of climate injustice	Root causes are the deep, structural reasons why climate change affects people unequally: • **Historical emissions inequality:** Wealthy industrialised nations have produced the vast majority of cumulative emissions since the Industrial Revolution, yet the worst impacts fall on the Global South. • **Colonialism and global inequality:** Colonial exploitation left many Global South nations economically weaker with less capacity to adapt. • **Fossil fuel dependency and corporate power:** Economic systems built on fossil fuels create powerful vested interests that resist transition to clean energy. • **Power imbalances:** Wealthier nations dominate international climate negotiations; those most affected have less influence. • **Inequality within countries:** Poorer communities, ethnic minorities, and marginalised groups bear a disproportionate burden due to worse housing, less access to resources, and less political representation.
Examples of individual and collective action	**Individual action:** Actions taken by single people - e.g. plant-based diet, reducing flying, choosing renewable energy, second-hand goods, writing to politicians, attending protests. *Limitations:* Important for signalling demand and reducing personal carbon footprints, but cannot by themselves change the systems that drive climate change. **Collective action:** Organised activity by groups working together - e.g. Fridays for Future; Extinction Rebellion; Pacific Climate Warriors; community energy co-operatives; trade union just transition campaigns; NGO climate policy lobbying. Collective action can shift public opinion, pressure governments and corporations, change laws and policies, create new systems and institutions. Addresses root causes at a systemic level.
How effective these actions can be	**Individual action effectiveness:** Can contribute to demand-side change (falling demand for meat; growth of EV market); can influence others through social norms; raises awareness. But limited by structural factors - many people cannot afford green choices; individual action without systemic change shifts responsibility from corporations to individuals. **Collective action effectiveness:** Historic examples - civil rights, suffragette, anti-apartheid movements - achieved systemic political change. Climate movements have contributed to stronger international agreements (Loss and Damage Fund), national climate legislation, and cultural shifts. **Ensuring needs are met now and in future:** Effective action must be both collective and just - addressing root causes (emissions reductions, redistribution, climate debt) while ensuring fairness (just transition, protection for vulnerable communities, global solidarity). Individual action alone cannot guarantee this; structural and policy change driven by collective action is essential.

Question 8 - Ecosystem Investigation (40 marks)

All four bullet points must be addressed. Assess holistically using the four criteria above.

Required Element	Expected Content - High-Band Response
The environmental factor investigated	Candidates name a specific environmental factor they investigated in a local ecosystem. Award marks for identifying a clearly measurable factor appropriate to their chosen ecosystem. **Examples:** Light intensity (lux); Soil pH; Soil moisture content; Water pH / dissolved oxygen; Temperature; Species diversity / abundance; Salinity (coastal ecosystems). *Candidates should name a specific ecosystem (woodland, bog, river, school grounds, beach) and one specific factor.*
How qualitative and quantitative data were collected	**Quantitative data (numerical):** Counting species using quadrats; measuring light levels with a meter; recording soil pH at multiple sites; measuring temperature at intervals; counting organisms along a transect. **Qualitative data (descriptive):** Describing habitat condition (dense shade vs. open canopy); noting pollution indicators (lichen as air quality indicator); photographing the ecosystem; describing health or appearance of communities. *High-band responses explain both quantitative AND qualitative methods clearly.*
Actions to protect or improve the ecosystem	Specific, realistic actions relevant to the named ecosystem, e.g.: **Woodland:** Removal of invasive species (Rhododendron); fencing to prevent overgrazing; replanting native trees. **River / stream:** Reducing agricultural runoff through riparian buffer strips; removing fish migration barriers. **Bog:** Rewetting by blocking drainage channels; restricting turf cutting. **School grounds / park:** Wildflower meadows; bird and bat boxes; reducing mowing.

Required Element	Expected Content - High-Band Response
How the ecosystem and human well-being are interdependent	Two-way relationship between the ecosystem and human wellbeing. **Ecosystem services humans depend on:** • **Food and water** - clean water, pollination of crops, fish stocks. • **Climate regulation** - forests and bogs absorb CO_2; wetlands prevent flooding. • **Mental and physical health** - green spaces reduce stress. • **Cultural values** - identity, recreation, tourism. **Human impact on ecosystem:** Pollution, invasive species, habitat destruction, climate change all degrade ecosystems. When ecosystems are damaged, services they provide are lost - harming wellbeing in turn.

This marking scheme is indicative. Examiners should use professional judgement when awarding marks. Prepared by SimpleStudy for revision purposes - not an official State Examinations Commission document.