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CAMBRIDGE
International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/21**

Paper 2 Management in Context **May/June 2026**

MARK SCHEME

Maximum Mark: 80

Published

This mark scheme contains the instructions and marking guidance that our examiners used to mark candidate responses for this component.

Before they start marking, examiners complete a standardisation process. They review a range of candidate responses and discuss the mark scheme in detail to agree which answers can and cannot be accepted. Examiners award marks where it is clear that candidate responses have met the requirements of the mark scheme. These requirements may vary between different components or different versions of the same component, depending on the exact requirements of the question and the candidate responses seen during the standardisation process.

Sometimes, our mark schemes may allow marks to be awarded to responses which contain elements that are factually incorrect or for content not covered by the syllabus. We do this in response to the demands of a specific question to support candidates and make sure that our assessments are fair. However, these allowances should not be used as a guide for teaching and learning.

We cannot discuss the mark scheme with schools, and we recommend that schools read the mark scheme together with the assessment material and the Principal Examiner Report for Teachers.

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General marking principles

All examiners must apply these marking principles when marking candidate responses.

1	Examiners must award marks for each response in line with: • the specific **content** defined in the mark scheme • the specific **skills** defined in the mark scheme or in the level descriptions • the **standard of response** required as exemplified by the standardisation scripts.
2	Examiners must award **whole marks** (not half marks, or other fractions).
3	Examiners must award marks **positively**. This means that: • marks are not deducted for errors or omissions • marks are awarded for correct/valid answers as defined in the mark scheme and also for **other valid answers** which go beyond the scope of the syllabus and mark scheme referring to your team leader as appropriate • the quality of spelling, punctuation and grammar are judged **only** when the mark scheme indicates that these features are **specifically assessed** in the question. However, the meaning of all responses must be unambiguous.
4	Examiners must **consistently** apply the requirements of the mark scheme and any rules for what to do when candidates have not followed instructions correctly.
5	Examiners must use the **full range of marks** defined in the mark scheme, unless limited by the quality of the candidate responses seen.
6	Examiners must award marks according to the mark scheme and **must not** award marks with grade thresholds or grade descriptions in mind.

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Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	<u>'List rule' guidance</u> For questions that require ***n*** responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards ***n***. • Incorrect responses should not be awarded credit but will still count towards ***n***. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non-contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

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6 Calculation specific guidance

Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'.

For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values.

For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme.

Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.

7 Guidance for chemical equations

Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme.

State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

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Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
	correct point or mark awarded
	incorrect point or mark not awarded
	information missing or insufficient for credit
	incorrect or insufficient point ignored while marking the rest of the response
	contradiction in response, mark not awarded
	benefit of the doubt given
	error carried forward applied
	First answer
	response has not answered question
	power of ten error

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Annotation	Meaning
SEEN	point has been noted, but no credit has been given or blank page seen
TV	response is too vague or there is insufficient detail in response
REP	repetition in response
●	to show a correct point but where the number of points does not relate to the number of marks i.e. 3 correct= 2 marks
✓ 1	correct awarding one mark from marking point or marking group 1. similar numbered ticks are used for marking point or marking groups 2, 3, 4 etc.
Highlighter	Highlight

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Mark Scheme Abbreviations

Abbreviation	Meaning
;	separates marking points
/	alternative responses for the same marking point
R	reject the response
A	accept the response
I	ignore the response
ecf	error carried forward
AVP	any valid point
ora	or reverse argument
AW	alternative wording
underline	actual word given must be used by candidate (grammatical variants excepted)
( )	the word / phrase in brackets is not required but sets the context
max	indicates the maximum number of marks that can be given
M1, **M2**….	marking point reference

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Question	Answer	Marks	Guidance
1(a)(i)	500 km ;	**1**	
1(a)(ii)	*any one from:* M1 infrastructure or stated example e.g. transport links / has a port; M2 education ; M3 healthcare / hospitals ; M4 employment or job opportunities or stated example e.g. jobs in tourism ; M5 access to fisheries / access to food (source) **AND** from sea ;	**1**	**ignore** on the coast / next to the sea / next to Atlantic ocean / quality of life / good climate **ignore** poverty **ignore** used to be the capital city / centre of economy / exporting unqualified M3 **accept** lack of access to birth control
1(a)(iii)	M1 256.6 ; M2 unit: people / km^2 people / square km people / square kilometre ;	**2**	M1 **accept** 257 M1 **accept** correct rounding of 256.5579236 M1 **accept** rounding up or down from 5 e.g. 256.5 M2 **accept** population or persons for people M2 **accept** p or popn or pp or pop for people M2 **accept** per for the solidus / e.g. people per km^2 M2 **reject** million per km^2 / people M2 **accept** capitals for KM M2 **accept** people km^{-2}

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Question	Answer	Marks	Guidance
1(b)(i)	M1 largest first starting at 'noon' going clockwise or anticlockwise ; M2 sectors in clockwise rank order from noon ; M3 correct plotting with straight lines used for sectors ; M4 key completed and matches sector shading ;	**4**	**guidance:** use the protractor tool on RM for 0–14 and 65 + only **guidance**: annotate vertically M2 **guidance**: rank order: 15–64 > 0–14 > 65+ M4 **ignore** % in key e.g. 43, 54, 3 M4 **accept** numbers or letters e.g. 1, 2, 3, A, B, C M4 **guidance (1)**: rank order is not needed in the key – we are looking for the sector shading to match the key boxes. If the plotting is incorrect, we then look at the proportions (see M4 guidance **2**). M4 **guidance (2)**: plotting incorrect but sectors in correct proportions e.g. 15–64 > 0–14 > 65+ by eye and key shading matches sectors = M4
1(b)(ii)	A ;	**1**	**accept 'A'** circled or identified on pyramid if answer line is BLANK but answer line takes precedent

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Question	Answer	Marks	Guidance
1(b)(iii)	*any three from:* M1 increase in **working** population / more **working** age people ; M2 change in jobs or change in number of a stated job e.g. change in number of jobs in construction ; M3 increase in **young dependents** ; M4 (need) more schools / insufficient school places ; M5 (need) more hospitals or healthcare ; M6 (need) more homes / increase in house or land prices ; M7 (need) more infrastructure / stated example e.g. more waste disposal facilities needed ; M8 increase demand or increase in cost for food or water ; M9 increase demand or increase in cost of energy ; M10 more tax revenue ;	**3**	**ignore** generation of wealth / impact economy **ignore** change dependency ratio / quoted age ranges / more babies **ignore** poverty or wealth unqualified **ignore** resources unqualified **ignore** overcrowding / increase in population density M2 **accept** more or less unemployment / more labour M3 **ignore** increase in elderly dependents / reference to elderly people M3 **accept** more young dependents described e.g. more young people need looking after / young people do not contribute to economy M4 **ignore** education unqualified M5 **accept** need more public services M4 M5 M6 M7 M8 M9 **accept** idea of lack of xxx e.g. lack of schools / lack of hospitals / lack of food / lack of homes M10 **ignore** pensions M10 **ignore** GDP / foreign exchange unqualified M10 **accept** more non-tax payers

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Question	Answer	Marks	Guidance
1(b)(iv)	*any three from:* M1 lack of education on or accessibility to, family planning / contraceptives ; M2 high infant mortality ; M3 traditional / cultural, reasons ; M4 government / pronatalist, policy ; M5 limited opportunities or jobs for women / limited education (for all) ;	**3**	**ignore** irrelevant responses **ignore** economic reasons M1 **guidance**: education on contraceptives is not the same as general education M2 **accept** poor healthcare M3 **accept** religious reasons / early marriage / have children to work / need for a workforce / have children to look after parents when they are older M4 **accept** there are no antinatalist policies
1(c)(i)	2012 ;	**1**	
1(c)(ii)	*any one from:* M1 fluctuates / data goes up and down ; M2 only two large values / peaks in data ; M3 no obvious pattern / natural hazards or data are random or unpredictable ; M4 some numbers too small to be seen on the scale used / no data recorded for some years / missing or gaps in data;	**1**	**ignore** anomalies / outliers / not representative / reliable / accurate / precision / validity / mean **ignore** sample size M3 **accept** data not consistent / data shows variation or scattered

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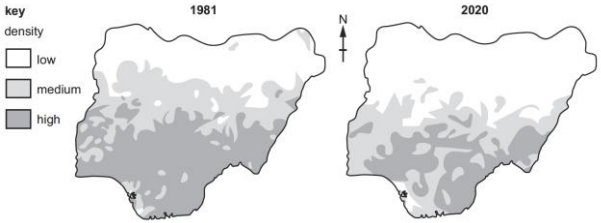
0680/21 Mark Scheme June 2026

GradeMax

Question	Answer	Marks	Guidance
1(c)(iii)	*any three from:* M1 drought ; M2 flooding / heavy rains ; M3 cyclones / hurricanes ; M4 wild fires ; M5 extreme heat / heatwaves ; M6 mass land movement / landslides / mudslides ; M7 disease / pandemics / stated example e.g. COVID 19 ;	3	**apply list rule** **ignore** tectonic events e.g. earthquakes, tsunamis, volcanic eruptions **ignore** global warming / climate change **ignore** crop failure **ignore** extreme weather unqualified **reject** acid rain **reject** ozone hole **reject** non-natural hazards e.g. war M2 **accept** storm **surges** (this gets M2 only and is not enough for M3 storms) M3 **accept** storms / tornado / monsoons / typhoon M3 **accept** La Nina / El Nino M4 **accept** forest fires

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Question	Answer	Marks	Guidance
2(a)(i)	*any two from*: M1 (overall) increased ; M2 to south / on south coast / in north or north-east ;	**2**	**ignore** refs to medium or high density **ignore up down left right** **ignore** descriptions of low-density vegetation e.g. less trees M1 **accept** there is more (in 2020) M1 **accept** changed from 30% to 50% M2 **accept** extended or spread to middle or interior (of country) 
2(a)(ii)	*any three from:* M1 stated example of change in climate e.g. temperature increase or decrease / drought / flooding ; M2 decreased soil fertility / (increased) soil erosion ; M3 increased demand for trees / forests cleared / deforestation / more logging ; M4 mining / mineral extraction ; M5 increased animal grazing / overgrazing ; M6 urbanisation or stated example e.g. (new) cities / infrastructure or houses or roads; M7 natural disaster or stated example e.g. wildfires ; M8 (plant) disease / invasive species / pests ;	**3**	**ignore** habitat / biodiversity / food web or chain **ignore** increase in population **ignore** pollution / water pollution M1 **ignore** global warming / greenhouse effect / climate change unqualified M1 **ignore** weather changes unqualified M1 **guidance**: response needs to be comparative i.e. hotter rather than hot (weather) M1 **accept** hotter / colder / less or more rainfall / drier / wetter M2 **accept** desertification / soil erosion described M3 **accept** stated use for wood e.g. paper / fuel M5 **accept cleared** for, agriculture / farming / cleared for growing crops or cultivation / overcultivation

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Question	Answer	Marks	Guidance
2(a)(iii)	the variety of <u>species</u> **or** the different <u>species</u> **AND** within a, habitat / ecosystem / area ;	**1**	**ignore** a lot of / many / multiple species **accept** number / different / type, of species in an area **accept** genes for species **ignore** environment **accept** biome to mean ecosystem
2(b)(i)	*any one from:* M1 difficult to see / difficult to count when dark ; M2 move around ; M3 large areas of forest ; M4 insufficient scientists to search for them ;	**1**	**ignore** active at night / only appear at night / nocturnal / **ignore** small M1 **accept** elusive / camouflaged / cannot be seen / not easy to find / they hide M3 **accept** dense or inaccessible forest or area / remote area
2(b)(ii)	M1 method of dividing up the forest e.g. grid / coordinates / GPS ; M2 stated method of **random** number selection e.g. **random** number generator ;	**2**	M1 **ignore** map unqualified M1 **ignore** quadrat unqualified without reference to equal size M1 **accept** divide into **equal** sized quadrats / divide the forest into **equal** sized areas or numbered **equal** sized areas using a map or **equal** sections M2 **CON** references to systematic sampling M2 **ignore** randomly select numbers / use randomised numbers / use calculator unqualified M2 **accept** use random number generator / roll dice / pick squares out of a hat / use AI to randomly pick

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Question	Answer	Marks	Guidance
2(b)(iii)	*any one from:* M1 repeat (the investigation) / description of repeat e.g. carry out at different season ; M2 increase the number of sampling sites / sample at different sites ;	1	**ignore** use another method or stated method / mark recapture / pitfall traps / transects / quadrats / beating tray **ignore** calculate mean / identify outliers M2 **accept** sample in different place or areas
2(c)(i)	*any two from:* M1 educate (people about them) / increase awareness ; M2 idea of encourages governments (to pass laws) to protect pangolins or habitat ; M3 idea of fewer pangolins hunted / discourages poaching ; M4 raises **money** to protect or research pangolins ;	2	M1 **ignore** copying of question info e.g. publish latest information M1 **accept** shows people where they are so can avoid them M1 **accept** description of how awareness protects pangolin e.g. people more likely to be interested in pangolin or volunteer to look after them / (encourages) ecotourism
2(c)(ii)	*any from wildlife reserves:* M1 a stated human activity that is restricted e.g. hunting / tourism ; *any one from wildlife corridors*: M2 allows pangolins to move from one area to another / safe routes between areas ; M3 find mates to breed / increase chance of mating ; M4 increases, gene pool / genetic diversity / less chance of inbreeding ; M5 more food sources ;	2	**ignore** increases habitat unqualified **ignore** predators **ignore** not disturbed by human activity or protected from humans, unqualified by how they are not disturbed or protected M1 **accept** less chance of hunting or being hunted M1 M3 **ignore** safe place / place to breed M2 **accept** areas or habitats connected / lets them move freely (between areas or habitats) / idea of expanding available habitat

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Question	Answer	Marks	Guidance
2(d)(i)	M1 pyramid shape, widest at bottom and narrowest at top ; M2 four horizontal rectangles drawn in pyramid shape one on top of each other ; M3 correct order with **ONLY** four organisms labelled from bottom to top: plants → insects → pangolin → lion	**3**	**annotate vertically** **ignore** numbers in bars / differences in bar height M1 **accept** triangle M1 **reject** inverted pyramid or inverted triangle M1 **reject** left aligned or right aligned pyramids or triangles M2 **accept** lines not drawn with ruler M2 **accept** four horizontal sections in a triangle M2 **accept** single line for top bar M2 **accept** ± 3 small squares asymmetry around the mid point M2 **guidance** minimum of 4 sections, accept more than 4 sections, so this can be in a triangle M3 **reject** incorrect food chain or order M3 **reject** inclusion of sunlight M3 **ignore** producer, consumer labels M3 **accept** labels outside of rectangles, with or without label lines or arrows to rectangles M3 **accept** for list of the organisms with arrows in correct order: plants → insects → pangolin → lion or vertical list with arrows in this order:
2(d)(ii)	lion(s) ;	**1**	**reject** additional organisms

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Question	Answer	Marks	Guidance
2(d)(iii)	M1 secondary consumers (often) larger in size (than primary consumers) / ora ; M2 (90%) energy lost between (trophic) levels / less energy available in higher (trophic) levels (of the food chain) ; M3 stated way that energy is lost e.g. movement / respiration / excretion / reproduction / ingestion / egestion / digestion / waste products / some parts of animal not eaten ; M4 the energy is lost as, heat or thermal energy ;	**3**	M2 **ignore** energy transfer is not efficient M2 **ignore** primary consumers as a group contain less energy M2 **accept** individual primary consumers contain less energy M2 **accept** 10% is passed on between trophic levels M3 **guidance** needs to relate to energy in some way so 'animals move' or 'animals respire' is not enough M3 **ignore** decomposition / death M3 **accept** life processes M2 M3 energy lost due to stated process = [2] marks
2(d)(iv)	M1 *increase*: less competition for stated resource e.g. food sources / prey / habitat ; M2 *decrease*: increased predation (of other organisms) ;	**2**	M1 **ignore** resources unqualified M1 **ignore** more insects unqualified as need to relate to prey or food M1 **accept** more food / more prey / more insects to eat M2 **ignore** more predators unqualified / no pangolins to eat M2 **ignore** lions unqualified M2 **accept** more of these (other) organisms are eaten / more predation / more predators per prey / more lions per prey / increased chance of getting hunted / predator or lions will look for another source of prey / lions eat other animals (instead)

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Question	Answer	Marks	Guidance
3(a)(i)	M1 285.1 ; M2 24.2 ;	**2**	**ignore** minus sign note '4' can look like 9 or 7 M2 correct answer = [2] M2 **accept** 24 M2 **accept** ecf a correct answer from: 69 ÷ their M1 × 100 **or** their untotalled values from the table used correctly in the expression for determining the percentage M2 **accept** correct rounding on ecfs M2 **accept** rounding up or down from a '5' from ecfs
3(a)(ii)	*any three from:* M1 (remains of) marine organisms / organisms on sea bed ; M2 deposited as **sediment** / **sedimentation** (occurs) ; M3 (remains) (only) **partially** decayed / anaerobic conditions / lack of oxygen ; M4 pressure **and** (high) temperature ; M5 (over) millions of years ;	**3**	M1 **reject** organisms not in the sea M1 **ignore** aquatic M1 **accept** living organisms die in the sea / plankton die / stated marine organism / plants in sea die M2 **ignore** buried unqualified M2 **accept** buried with **sediment** / layers with **sediment** / formed **sediment** / covered by **sediment** / layers of rock form on top M3 **accept partially** decompose M4 **ignore** melting M4 **accept** pressure and heat M4 **accept** compressed or compaction for pressure M5 **ignore** over time / many years M5 **CON** millennia / thousands

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Question	Answer	Marks	Guidance
3(a)(iii)	(a resource that) cannot (naturally) replenish / cannot be replaced / finite ;	**1**	**ignore** cannot be remade / cannot be used over again / non-reusable / cannot be reused / not recyclable / not sustainable / cannot be renewed / one time use **ignore** has a limit unqualified **ignore** stated time frames **ignore** uses fossil fuels **CON** for naming a renewable resource e.g. solar **accept** cannot be used infinitely / will be used up / will run out / cannot be regenerated / will deplete / used quicker than is made / it will finish / limited **supply** / has a limit on **usage**
3(a)(iv)	*any three from:* M1 has large reserves ; M2 limited alternative resources or stated resource e.g. tidal not available ; M3 established industry / known technology / provides jobs ; M4 easy to extract ; M5 economic value / to sell / generate foreign exchange ; M6 reduced cost AND qualified reason e.g. cheaper than alternative energy resources / expensive to switch to other resources / idea of reducing costs as do not need to import oil ; M7 high demand or stated demand e.g. needed for cars / heating / air conditioning / to generate electricity	**3**	**ignore** ease of transport of oil **ignore** produces a lot of energy M1 **accept** idea of Nigeria has a lot of oil M2 **ignore** reliable without qualification M2 **accept** not dependent of stated external factor e.g. not dependent on amount of wind or sun M4 **accept** easy to mine or obtain M5 **accept** can be exported M6 **ignore** cheap or cost unqualified M6 **ignore** cheap to extract

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Question	Answer	Marks	Guidance
3(a)(v)	*any two from:* M1 change in, weather / temperature ; M2 affordability / change in cost, (of energy) ; M3 availability or stated reason for change in availability e.g. conflict ; M4 stated reason for change in use e.g. use of air conditioners ;	**2**	**guidance:** responses need to refer to reasons for **fluctuations** rather than progress or lack of progress **ignore** population / birth rate, change / migration **ignore** change in demand M1 **accept** climate change / global warming / (enhanced) greenhouse effect / extreme weather M2 **accept** price of energy / inflation / wealth of individuals (in the country) / economy (of country) M3 **accept** low supply M4 **ignore** advancement in technology
3(b)	*any two from:* M1 employment / jobs; M2 cannot afford to live elsewhere ; M3 improvements to infrastructure or stated example e.g. roads / communications / health facilities / schools ; M4 improvement in **local** economy ;	**2**	**ignore** poverty unqualified / access to oil / transport of oil **ignore** nowhere else to go unqualified M1 **accept** live close to where they work M2 **accept** houses or land is cheap M3 **ignore** standard of living M3 **accept** multiplier effect or described M4 **ignore** economy without idea of being a benefit to 'local' people
3(c)(i)	*any two from:* M1 methane is a greenhouse gas ; M2 contributes to, the (enhanced) greenhouse effect / global warming / climate change ; M3 stated impact of climate change e.g. causes sea level rise ; M4 flammable gas / risk of explosions / risk of fire ;	**2**	**ignore** air pollution / habitat or biodiversity loss M1 **CON** CFC M2 **accept** global warming described M2 **CON** reference to ozone depletion / acid rain

GradeMax

Question	Answer	Marks	Guidance
3(c)(ii)	*any one from:* M1 stated example of air pollution: smog / smoke / particulates / toxic gases ; M2 breathing difficulties ; M3 crops become polluted ; M4 risk of fires ; M5 risks of burns (to people) ;	**1**	**ignore** global warming / climate change / carbon dioxide **ignore** air pollution unqualified / visual pollution **ignore** suffocation / smell **ignore** death / injuries unqualified **ignore** explosions **ignore** 'affect 'effect' M1 **ignore** harmful substances M1 **accept** benzene / toluene / carbon particles / carbon monoxide / CO / volatile organic compounds / VOCs / sulfur dioxide / NOx M2 **accept** damage lungs / respiratory problems / eye irritation / cancer / asthma / lung or breathing problems or issues M3 **accept** crop failure / kills crops
3(c)(iii)	M1 [7539 + 7760 + 7195 + 6627 + 5318] ÷ 5 **or** 34 439 ÷ 5 **or** 6887.8 ; M2 correct rounding to nearest whole number: 6888 ;	**2**	M2 **ecf** on their M1 correct rounded to a whole number M2 **accept** round up or down from 5 from their ecf M2 correct answer = 2 marks M2 **accept** 6888.0
3(c)(iv)	*any two from:* M1 overall decrease (from 2013 to 2022) ; M2 fluctuates / goes up and down ; M3 overall change of 4023 **AND** million m^3 (from 2013 to 2022) ;	**2**	**ignore** quoted data M1 **accept** decreases over the years M1 **reject** decreases EVERY year M2 **ignore** dates for when it fluctuates M3 **reject** answers without units

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Question	Answer	Marks	Guidance
3(d)(i)	*any two from:* M1 rain ; M2 run off / washed off surface ; M3 rivers carry or transport oil (to sea or coast) ;	**2**	**ignore** slope of landscape / transfer by animals or birds **ignore** references to oil tankers or ships / dumped at sea / offshore M1 **reject** by wind / air M1 **accept** floods M2 **accept** leaching M3 **ignore** movement underground or in groundwater
3(d)(ii)	*any three from:* M1 toxic ; M2 shortage of food / kills the prey (of birds) ; M3 bioaccumulation (when prey is ingested) ; M4 coats feathers or bird or wings **AND** so cannot fly ; M5 coats feathers or bird or wings **AND** so not insulated or get hypothermia M6 coats their nostrils / causes suffocation ; M7 feathers stop being waterproof ; M8 oil covers surface of water preventing birds from seeing or catching prey ; M9 damages coastal nesting sites / reduces chances of (successful) breeding ; M10 eye irritation / blindness ; M11 skin irritation ;	**3**	**ignore** kills unless qualified **ignore** can't see unqualified **ignore** photosynthesis **ignore** disrupts food chains or webs / loss of habitat **ignore** harm unqualified M1 **accept** poisonous M3 **accept** bioaccumulation described / biomagnification or biomagnification described M4 **accept** feathers clump together **AND** cannot fly or affects ability to fly M4 **accept** coats feathers **AND** weighs them down **AND** causes drowning or cannot fly M5 **accept** coats feathers **AND** get hyp**er**thermia M6 **accept** choking M7 **accept** feathers clump together **AND** stop being waterproof

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Question	Answer	Marks	Guidance
3(d)(iii)	M1 *booms*: prevent the oil from spreading ; M2 *detergent sprays*: breaks up oil ; M3 *skimmers*: remove or scrape oil from the (water) **surface** ;	**3**	**ignore** clean the oil M1 **accept** gather / catches / captures / traps / acts as barrier / encloses / collects / surrounds the oil (on the surface) M2 **accept** disperse / degrade / decompose / break down / dissolve the oil M3 **guidance**: looking for reference to **surface** or a (top) **layer** of oil or oil and water have different densities M3 **accept** skim oil or collects from (water) **surface**
3(e)(i)	2.5×10^{10} ;	**1**	**accept** correct rounding of 24 869 746 835.4430 e.g. 24 869 746 840 e.g. 24 870 000 000 / 25 000 000 000 / 25 billion / 25 000 million **accept** other standard form e.g. 24.9×10^{9} 248.7×10^{8} 2486×10^{7} $2\,487.0 \times 10^{7}$ $24\,869.7 \times 10^{6}$ $248\,697.5 \times 10^{5}$ $2\,486\,974.7 \times 10^{4}$ $24\,869\,746.8 \times 10^{3}$ $248\,697\,468.4 \times 10^{2}$

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Question	Answer	Marks	Guidance
3(e)(ii)	*any two from:* M1 increase in demand or use or increase in stated use e.g. more technology / increased use of air conditioners ; M2 increase in population (of Nigeria) ; M3 increased exports / sold to other **countries** ; M4 prediction was wrong / estimate was inaccurate ;	**2**	**ignore** economic status of country **ignore** leaks / spills **ignore** climate change / global warming M1 **accept** need more energy M3 **ignore** sold unqualified M4 **accept** estimate was wrong
3(e)(iii)	*any two from:* M1 dedicated car lanes for multiple occupancy (in car) / car sharing / restrictions for car usage or stated example driving on certain days of the week ; M2 stated financial **penalty** e.g. charges for using car in cities / parking controls / congestion charge / road tolls / taxation ; M3 stated financial **incentives** e.g. financial incentive for selling 2nd car / subsidies for buying an electric vehicles / lower road tax for electric vehicles / cheaper public transport ; M4 more / improved access to / priority in roads given to, public transport ; M5 introduce cycle lanes or pedestrian areas / priority for bikes or pedestrians compared to cars ; M6 improved infrastructure for electric cars or EVs / more charging points for EVs ; M7 public awareness / advertising ;	**2**	**ignore** urban planning / harder driving exam **ignore** legislation unqualified **ignore** harsher penalties for breaking driving laws M2 **accept** other stated vehicle-use charge e.g. ULEZ / increase cost of fuel / increase cost of cars / tax on cars / stated tax M4 **ignore** list of public transport vehicles e.g. bus, train unqualified without idea of more etc. M4 **accept** (use of) public transport M6 **accept** (use of) EVs / electric vehicles

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Question	Answer	Marks	Guidance
3(e)(iv)	*any two from:* M1 renewable ; M2 idea of carbon neutral ; M3 makes use of waste materials ;	**2**	**ignore** pollution unqualified **ignore** cost **ignore** acid rain M1 **accept** descriptions of renewable M2 **ignore** less CO_2 emitted without **net** carbon emissions or **overall** emissions M2 **ignore** less CO_2 emissions – as no reference to NET or OVERALL M2 **accept** carbon neutral described e.g. less CO_2 emitted **overall** / less **net** CO_2 emitted M2 **accept** carbon to mean carbon dioxide M3 **ignore** extraction / easier to obtain / readily available M3 **accept** sustainable

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Question	Answer	Marks	Guidance
3(e)(v)	*any two from:* M1 risk of deforestation / requires **large** areas of land ; M2 grown in place of food crops / causes food shortages / increase food prices ; M3 irrigation of crops may cause water shortage (for other uses) ; M4 not all vehicles can run on biofuels / vehicles need to be converted to run on biofuels ;	**2**	**ignore** take up space unqualified / cost unqualified **ignore** availability of biofuels or fossil fuels **ignore** lack of technology **ignore** loss of habitat / loss of biodiversity M4 **accept** cost of converting vehicles to biofuel M5 **ignore** less energy / less energy when used unqualified M5 **ignore** efficiency M5 **allow** biofuels have less energy density (than fossil fuels) / less energy in tonne of biofuel than tonne of fossil fuels M6 **allow** stated cost of growing biofuels e.g. cost of fertilisers or irrigation

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