Rewarding Learning

ADVANCED
General Certificate of Education
2011

Geography

Assessment Unit A2 2

assessing

Physical Geography and Decision Making

[AG221]

TUESDAY 24 MAY, AFTERNOON

MARK SCHEME

MARK SCHEMES

Foreword

Introduction

Mark Schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of 16 and 18-year-old students in schools and colleges. The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes therefore are regarded as a part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

The Council hopes that the mark schemes will be viewed and used in a constructive way as a further support to the teaching and learning processes.

Introductory Remarks

The assessment objectives (AOs) for this specification are listed below. Students must:

AO1 demonstrate knowledge and understanding of the content, concepts and processes;

AO2 analyse, interpret and evaluate geographical information, issues and viewpoints and apply understanding in unfamiliar contexts;

AO3 select and use a variety of methods, skills and techniques (including the use of new technologies) to investigate questions and issues, reach conclusions and communicate findings.

General Instructions for Markers

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all markers are following exactly the same instructions and making the same judgements so far as this is possible. Markers must apply the mark scheme in a consistent manner and to the standard agreed at the standardising meeting.

It is important to recognise that in some cases there may be other correct responses that are equally acceptable to those included in this mark scheme. There may be instances where certain judgements have to be left to the experience of the examiner, for example, where there is no absolute, correct answer.

Markers are advised that there is no correlation between length and quality of response. Candidates may provide a very concise answer that fully addresses the requirements of the question and is therefore worthy of full or almost full marks. Alternatively, a candidate may provide a very long answer which also addresses the requirements of the question and is equally worthy of full or almost full marks. It is important, therefore, not to be influenced by the length of the candidate's response but rather by the extent to which the requirements of the mark scheme have been met.

Some candidates may present answers in writing that is difficult to read. Markers should take time to establish what points are being expressed before deciding on a mark allocation. However, candidates should present answers which are legible and markers should not spend a disproportionate amount of time trying to decipher writing that is illegible.

Levels of Response

For questions with an allocation of six or more marks three levels of response will be provided to help guide the marking process. General descriptions of the criteria governing levels of response mark schemes are set out on the next page. When deciding about the level of a response, a "best fit" approach should be taken. It will not be necessary for a response to meet the requirements of all the criteria within any given level for that level to be awarded. For example, a Level 3 response does not require all of the possible knowledge and understanding which might be realistically expected from an AS or AL candidate to be present in the answer.

Having decided what the level is, it is then important that a mark from within the range for that level, which accurately reflects the value of the candidate's answer, is awarded.

General Descriptions for Marking Criteria

Knowledge and Understanding	Skills	Quality of Written Communication	Level
The candidate will show a wide-ranging and accurate knowledge and a clear understanding of the concepts/ideas relevant to the question. All or most of the knowledge and understanding that can be expected is given.	The candidate will display a high level of ability through insightful analysis and interpretation of the resource material with little or no gaps, errors or misapprehensions. All that is significant is extracted from the resource material.	The candidate will express complex subject matter using an appropriate form and style of writing. Material included in the answers will be relevant and clearly organised. It will involve the use of specialist vocabulary and be written legibly and with few, if any, errors in spelling, punctuation and grammar.	3
The candidate will display an accurate to good knowledge and understanding of many of the relevant concepts/ ideas. Much of the body of knowledge that can be expected is given.	The candidate will display evidence of the ability to analyse and interpret the resource material but gaps, errors or misapprehensions may be in evidence.	The candidate will express ideas using an appropriate form and style of writing. Material included will be relevant and organised but arguments may stray from the main point. Some specialist terms will be used and there may be occasional errors in spelling, punctuation and grammar. Legibility is satisfactory.	2
The candidate will display some accurate knowledge and understanding but alongside errors and significant gaps. The relevance of the information to the question may be tenuous.	The candidate will be able to show only limited ability to analyse and interpret the resource material and gaps, errors or misapprehensions may be clearly evidenced.	The candidate will have a form and style of writing which is not fluent. Only relatively simple ideas can be dealt with competently. Material included may have dubious relevance. There will be noticeable errors in spelling, punctuation and grammar. Writing may be illegible in places.	1

Section A

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Option A: Fluvial and Coastal Environments

1 (a) An appropriate description of the ways in which this stretch of coastline is subject to increasing and varied demands should be given. This may include, for example, increasing residential and recreational use with associated utilities.

Level 3 ([7]–[8])
At least two ways in which the stretch of coastline presented by the resource is subjected to increasing and varied demands is given. The response is strongly supported by information gleaned from the resource.

Level 2 ([4]–[6])
At least two ways in which the stretch of coastline presented by the resource is subjected to demands is given; however, restricted emphasis may be placed upon the 'increasing' or 'varied' elements of the question. There is some, albeit restricted, support from resource-based information.

Level 1 ([1]–[3])
Perhaps only one way in which the stretch of coastline presented by the resource is subjected to demands is given. Either the 'increasing' or 'varied' elements of the question may be neglected. The response may not be supported by information gleaned from the resource, or it may lack validity or clarity. [8]

(b) The candidate should present an annotated diagram or diagrams to support an explanation of the way in which the selected landform has been formed. Both diagrammatic material and written description are required.

Level 3 ([6]–[7])
An accurate and well presented diagram or diagrams is presented along with a clear description of the relevant coastal processes. Depth/details are present.

Level 2 ([3]–[5])
Either the diagram/s or explanation of the creative processes is incomplete in a significant way (such as restricted depth/detail, poor quality of construction).

Level 1 ([1]–[2])
The response may lack any relevant diagram and/or the explanation may be very restricted in depth, quality or relevance. [7]

(c) The candidate is asked to discuss the ways in which implementation of a basin management scheme brought beneficial outcomes and conflicts of interest to a relevant and valid case study of a river basin at a regional scale.

Level 3 ([11]–[15])
The answer refers to a relevant case study example of an appropriate scale. Both the beneficial outcomes and the conflicts of interest of a valid and relevant implemented scheme are discussed in a balanced manner. A high level of appropriate detail is given. Terminology is good.

Level 2 ([6]–[10])
The answer refers to a relevant case study example of an appropriate scale. Both the beneficial outcomes and the conflicts of interest of a valid and relevant implemented scheme are discussed although, perhaps, in an unbalanced manner. Case study detail is restricted. Terminology may be restricted.

Level 1 ([1]–[5])
The answer may refer to a case study of an inappropriate scale or nature. One or more elements of the question (beneficial outcomes, conflicts of interest) may be neglected. Case study detail may be very restricted. Terminology may be poor. [15]

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2 **(a)** Award maximum [2] for appropriate statement of the meaning of channelisation.

Level 3 ([6]–[7])
The sequence of impacts of one method (A, B, C or D) is identified and logically explained with validity, clarity and detail. The response is strongly supported by information gleaned from the resource.

Level 2 ([3]–[5]
The sequence of impacts of one method (A, B, C or D) is identified and explained although validity, clarity and/or detail may be restricted. There is some, albeit restricted, support from resource-based information.

Level 1 ([1]–[2])
There is a limited attempt to identify and explain the sequence of impacts of one method (A, B, C or D). Thus, validity, clarity and/or detail may be neglected. The response may not be supported by information gleaned from the resource. [2] + [7] = [9]

(b) A valid solution should be identified with an appropriate description of its operation.

Level 3 ([5]–[6])
A valid environmentally sensitive engineering solution is clearly identified. Its operation is described with clarity and relevant detail. Terminology is good.

Level 2 ([3]–[4]
A valid environmentally sensitive engineering solution is identified. Its operation is described, perhaps with limited clarity and restricted relevant detail. Terminology may be restricted.

Level 1 ([1]–[2])
The candidate does not clarify their identification of a valid environmentally sensitive engineering solution. The description of its operation may be cursory, invalid or restricted in detail. Terminology may be poor. [6]

(c) The candidate is asked to outline the arguments for and against coastal protection in a valid case study location, and to state and justify their view as to whether coastal protection should be allowed to proceed in this location.

Level 3 ([11]–[15])
The answer refers to a relevant case study example of an appropriate scale. Both arguments for and against coastal protection in this location are clearly outlined. The view of the candidate is clearly stated and a strong, valid and relevant justification made to support this opinion. Appropriate details are given. Use of terminology is good.

Level 2 ([6]–[10])
The answer refers to a relevant case study example of an appropriate scale. Both arguments for and against coastal protection in this location are clearly outlined although, perhaps, in an unbalanced manner. Although the view of the candidate is stated and a justification made to support this opinion, either or both may lack some measure of clarity, relevance or validity. Case study detail may be restricted. Use of terminology may be restricted.

Level 1 ([1]–[5])
The answer may refer to a case study of an inappropriate scale or nature. One or more elements of the question (arguments for, arguments against, statement, justification) may be neglected. Case study detail may be very restricted. Use of terminology may be poor. [15]

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Option B: The Nature and Sustainability of Tropical Ecosystems

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3 (a) (i) Tropical Grassland. [1]

(ii) The annual northerly migration of the overhead sun brings the ITCZ low pressure cell and its associated convectional rain. As N'djamena lies 12°N of the Equator the overhead sun passes in May and again in August. Between these dates the hot and wet summer season provides almost all of the station's annual rainfall. The high temperatures of early summer due to the longer day length and the high angle of the overhead sun are partly moderately by the cloud cover associated with the high rainfall of July and August. In winter, November to March, while temperatures are a little lower there is no rainfall recorded. this is the consequence of the southward shift of the sub-tropical high pressure limb of the Hadley Cell that moves to dominate the region. The subsiding air and north easterly trade winds of this region brings seasonal hot, drought conditions.

Level 3 ([5]–[6])
Accurate explanation of the links of both the hot wet and hot dry seasons with the Hadley Cell are made. Specifically the role of the ITCZ and the migration of the system are developed and linked to the climate illustrated by the resource.

Level 2 ([3]–[4])
Some valid links are made between N'djamena's climate and the Hadley Cell but this is significantly limited. Only one season may be adequately discussed or links to the resource material is lacking.

Level 1 ([1]–[2])
The response lacks accurate reference to the Hadley Cell in its explanation and may simply describe the climate graph. [6]

(b) **One mark** for each flow correctly identified (3 x 1):
1 – Weathering of parent rock; 2 – Death of organic material/leaf fall; and 3 – Leaching. (Judge any other versions of these labels on their accuracy.)
The remaining **five marks** are for an accurate explanation of how these three flows operate in the context of a tropical forest ecosystem.
1 – Weathering of parent material is promoted by the hot and wet climate and the presence of organic acids in the soils. The weathering is therefore rapid and deep under tropical forest.
2 – The death of biomass is not seasonal but continues throughout the year. The much layered nature of the vegetation and the enormous biomass and biodiversity of both plant and animal species produces a high quantity of dead organic material (DOM) into the litter store.
3 – High annual rainfall totals and intense daily storms cause extensive and rapid downward leaching of water and nutrients through the soil. These deplete the upper horizons and plant roots of nutrients and may cause the re-deposition of nutrients at depth in the soil forming an impermeable plinthite or laterite layer. [8]

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	(c)	An appropriate small-scale case study is required and evaluation of the extent to which its management is sustainable from both economic and environmental perspectives should be discussed. **Level 3 [(11)–(15)]** The response accurately describes, with detail, and evaluates the sustainable management of a relevant case study both economically and environmentally. **Level 2 [(6)–(10)]** The answer refers to a relevant case study at the appropriate scale. Management is described and evaluated though the depth and detail of these is restricted. **Level 1 [(1)–(5)]** The answer omits at least one key element of the question: a relevant case study; one or other of the required two aspects of sustainability (economic and environmental) or any evaluation. [15]	30
4	**(a)**	The question requires a description of the natural vegetation of tropical forests and its role in the trophic structure of the forest ecosystem. The layered nature of the tropical forest vegetation and its critical role in the storage and exchange of energy and matter (nutrients) will form the focal points of an answer. Specific examples of plant species are required but these do not need to be tied to any one location or region. **Level 3 [(7)–(9)]** The candidate identifies both the nature and role of producers in tropical forest accurately and with reference to named species. **Level 2 [(4)–(6)]** The candidate makes reference to all the required elements of the question but some aspects lack depth and detail. **Level 1 [(1)–(3)]** The answer lacks in at least one major point, such as omitting the role of producers in the trophic structure or the naming of specific plant species. [9]	
	(b)	An annotated diagram is required and the question can be answered using the diagram alone. Both the process of salinisation and the environmental impact of salinisation should be clarified by the diagram. An appropriate diagram would identify the role of the sun, capillary action in the soil, evaporation and the deposition of salt in and on the soil surface. **Level 3 [(5)–(6)]** The diagram clarifies the processes that cause soil salinisation and the impact it has on the soil environment.	

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Level 2 [(3)–(4)]
A relevant diagram is provided but the illustration and/or its annotation do not clarify fully the salinisation process or its environmental impact.

Level 1 [(1)–(2)]
While a diagram is provided it does not adequately identify the salinisation process and/or its impact on the environment. If a written description is provided without a relevant diagram the response would be limited to this level. [6]

(c) The answer must discuss both the attempts at a solution featured in the resource. These both describe the use of genetically modified plant species that can be grown in salinised (salt damaged) soil. The second requirement is to detail a regional case study and specifically the possible solutions proposed in that context. Please note that should a candidate use Japan or Australia as their regional case study then additional material on proposed solutions, beyond the resource, must be provided.

Level 3 ([11]–[15])
The answer provides a clear and balanced discussion of both the resource material and possible solutions in a relevant regional case study context.

Level 2 ([6]–[10])
The resource is discussed and a relevant case study is provided but the depth and detail is limited in one or other case.

Level 1 ([1]–[5])
Answers neglecting the resource material or failing to provide a relevant case study are confined to this level. Alternatively a cursory discussion of both the resource studies and the regional study may be similarly restricted. [15] 30

Option C: The Dynamic Earth

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5 (a) (i) A diagram is required to aid the explanation of the formation of the island arc and trench. It is anticipated that a diagram, commonly a cross section, (2 or 3D) will illustrate the subduction of one oceanic plate beneath another producing a trench and a parallel line of volcanic islands.

Level 3 [(6)–(7)]
A relevant, accurate diagram is presented which is integrated into an explanatory account of subduction creating the deep ocean trench and volcanic island arc. Precise terminology is used with respect to the processes and features involved.

Level 2 [(3)–(5)]
A diagram and related text are both provided but the explanation is limited in depth or detail.

Level 1 [(1)–(2)]
A written explanation, of any quality but without a diagram would be confined to this level. Alternatively, a poor diagram with an explanation that lacks detail and the appropriate terminology would be similarly restricted. [7]

(ii) Linear patterns of volcanic activity can be found at a range of ***other*** plate margins including:

- destructive margins involving subduction of oceanic plate beneath a continental plate;
- constructive margins, either mid-oceanic such as the Mid-Atlantic (Iceland); or
- land-based constructive margins, such as the East Africa Rift valley.

At least one such plate margin should be described with a valid example. The second requirement is to identify how Hot Spots form linear volcanic activity such as the Hawaiian island chain in the Pacific Ocean. In both cases an explanation of their formation is needed.

In each case, plate margin and hot spot, award up to four marks as follows:
type and explanation 3 marks; and
relevant example 1 mark. (4 × 2) [8]

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	(b)	The answer should describe examples of volcanic activity hazards for all three aspects: social, economic and environmental. The description should include evaluation of these with reference to their scale of impact. **Level 3 [(11)–15)]** The answer contains a description of volcanic hazards, with relevant examples for all three aspects. The nature and degree of hazard is clarified as an evaluation of their impact. **Level 2 [(6)–(10)]** Relevant discussion of the three hazard aspects is provided but the depth and detail is limited. A lack of named examples for some areas or a restricted evaluation would also confine a response to this level. **Level 1 [(1)–(5)]** The answer may lack discussion of one or more of the three key aspects required or no evaluation is made of the degree of hazard. [15]	30
6	**(a)**	Based solely on the resource the candidate should explain the benefits of the volcanic springs at Sankampaeng in terms of both the society and the economy. These benefits relate to the improvement in the region's accessibility with improved roads and the availability of electricity, the opportunity for increased local employment with a wider market for locally produced goods, the opportunity to meet international visitors and the amenity of the site itself for local people. (3 marks) A second example of a volcanic activity provided by the candidate should also identify both social and economic benefits. This may not be a case study but at least an example location is expected. Possibilities include: soil fertility, the use of geothermal energy (not hot springs for tourism), land creation and mineral deposits. (3 marks) [6]	
	(b)	Candidates should demonstrate a sound knowledge of each of the three effects and how each relates to the earthquake activity. **Seismic shaking:** The release of energy waves radiating away from the focus of an earthquake causes the surrounding crust to shake. Several types of wave cause vibration of the ground surface and any structures built on it. These movements may be both lateral and vertical in nature. Seismic shaking is responsible for much of the damage done to the built environment in earthquake regions. **Liquefaction:** This effect is the result of loose unconsolidated ground being shaken by an earthquake event. In wet or dry sediments the vibration causes the ground to lose strength and act more like a liquid. The foundations of buildings or other structures will then lack support and may sink or topple. Liquefaction is a common cause of building collapse and may cause ground to spread and cracks appear at the surface.	

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	Tsunami: Earthquake events beneath the sea may transfer large quantities of energy into the water. In the deep ocean this energy can be transferred rapidly often as a long low wave. When these approach shallow water they can slow and build into a series of huge breaking waves and sweep across low lying coastal regions. The Boxing Day event of 2004 is modem example of such an event as a result of which around a quarter of a million people perished around the edge of the Indian Ocean basin. **(3 × 3 marks)** [9]	
(c)	Two case studies of earthquake activity are identified and relevant details of these studies are used throughout. The answer should discuss how the stage of development in the two studies influenced both the impact of earthquake activity and also the management of the event. **Level 3 [(11)–(15)]** The response identifies two appropriate studies and presents a discussion of how their stage of development influenced both the impact and management of the effects of the earthquake. **Level 2 [(6)–(10)]** Appropriate studies are identified but the discussion of impact and/or management in relation to stage of development lacks depth and development. **Level 1 [(1)–(5)]** The lack of one appropriate study would confine an answer to this level. Alternatively, an answer with relevant studies may lack the discussion of one of the aspects required. [15]	30
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Section B

Decision Making Paper

Introduction: some guiding principles

7 The ideas outlined in the "Guidance on Content" section are lines of thought that candidates might take in their report. They are not to be seen as the definitive answer, though it is to be expected that the points outlined below will feature, if only in part, in most answers. When allocating marks look favourably on answers which:

(a) avoid undue verbatim quoting from Resource Booklet and adopt a consistent style,

(b) use the full range of the resource material appropriate to the task – particularly where it is provided in non-literary format such as the OS map, printed maps and photographs,

(c) apply knowledge and concepts that are not specifically raised in the resource material, yet are both illuminating and relevant to the task,

(d) maximise opportunities presented by the resource material,

(e) appreciate that "bias" might exist in resource material which expresses particular views,

(f) avoid undue repetition of the same answer material in different sections or, if overlap is unavoidable, present it in a fresh way, and

(g) back up points with specific detail, e.g. giving statistical information where it is provided rather than making vague statements when details are readily available.

Guidance on content

(a) Introduction (Discuss the need for eco-towns and briefly describe the proposed Rackheath development.)

The British government set a target date of 2020 by which time they will reduce carbon dioxide emissions to just 60% of the 1990 levels. A key element of that is to reduce carbon emissions from dwellings. Originally it was planned to construct ten eco-towns, each with between 5,000 and 20,000 environmentally friendly dwellings. The shortlist of possible ecotowns was eventually narrowed to just one; Rackheath, 6 kilometres northeast of Norwich. Rackheath will also help to address some of the housing issues in Norwich, as house prices are high in the area. Even though there is a high percentage of social housing, the price of properties is beyond the reach of many on even average incomes. As at least 30% of houses in eco-towns have to be affordable to households with low income, these eco-towns may help to solve some of the housing problems in certain areas.

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This eco-town, Rackheath, will be built close to the small village of the same name joining it to neighbouring settlements of New Rackheath and Salhouse. It will also use some land currently used for industry, on what was previously a World War II airfield. In all there will be a total of 3,400 new houses built in the eco-town, joining 870 existing dwellings. In addition there will be places of employment, a new secondary school and other services and amenities in a series of mixed use developments. There are also plans for a windfarm and other sustainable energy sources. There will be a new railway station and public transport links to Norwich will be improved. Within Rackheath there will also be 124.5 hectares of green space set aside for the residents of the eco-town.

Level 3 ([7]–[8])
The candidate clearly discusses the need for eco-towns and clearly describes the proposed development. Both elements are included and the resource material is handled confidently and to good effect.

Level 2 ([4]–[6])
The candidate makes fewer clear and correct points. There is little or no development of any point, but points made are valid. Resources may not be exploited fully.

Level 1 ([1]–[3])
The candidate presents little content and a lot of it may be irrelevant to the need for eco-towns or the description of the proposal. Some of the points made may lack validity. [8]

(b) (i) The likely impact on: People and economy (Discuss the possible beneficial effects of the proposed development on people and the economy and the counterarguments.)

Local residents seem not to want this development with 71%, in response to a questionnaire, coming out against any development in Rackheath. However it may help those locals who require social housing. The charity, Shelter, says that the development will increase the number of houses that local people will be able to afford, and Gordon Brown agrees. This is particularly important as the population of the Norwich Planning Area is set to rise by 50,000 by 2025 and these people will require housing. The proportion of social housing in Norwich, at 38%, is higher than average in England so more social housing is required. Eco-towns must have at least 30% of the houses social housing, and the developers of Rackheath intend to make 40% of their housing affordable, so this should help to alleviate some of this need. Opponents of the eco-town's proposals claim that the houses are not affordable. The houses are expensive to build and opponents of eco-towns claim that they will be more than twice the cost of an average house in Norwich. On top of that all households in the eco-town are required to pay £200 each year for renewable energy. There are also fears of a £500 levy each year to subsidise public transport and to manage public space. This may well make these houses unattractive to people in medium or low incomes. On the other hand, those who support

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the development point out that the houses will be cheaper to run compared to traditional housing.

The new development will provide employment for the residents of the eco-town, providing an estimated 2000 more jobs than are already provided in Rackheath Industrial Estate (2813). Some of these may be in the shops on the central boulevard and in the smaller corner shops. As links with Norwich will be improved, this will bring employment opportunities in industrial estates and business parks there within reach of the Rackheath eco-town residents. There will also be jobs provided in the construction of the eco-town. This will also help to develop skills among the local population which will lead them to be more employable. Rackheath residents will not get all their social needs met in the town and it is unlikely that all will be employed there. There is a danger of Rackheath becoming another commuter settlement bringing little economic benefit to residents.

Level 3 ([7]–[8])
Candidate states clearly the main impact on people and the economy and the counterarguments. Both aspects of the subheading (people and the economy) have to be discussed. The account will have many of these characteristics:

- the points made will be consistently relevant and logically structured;
- the ideas will demonstrate insight and a level of sophistication;
- clear understanding of all concepts will be demonstrated;
- use will be made of most of the relevant resource material – no significant points will be omitted;
- figures, where available and appropriate, will be used to good effect; and
- ideas will be expressed clearly and effectively.

Level 2 ([4]–[6])
Candidate will have fewer lines of thought or discussion may be limited. However, while ideas may lack depth and/or detail, they are still adequate. There may be an imbalance between the two sides of the argument. The account may show deficiencies in the following ways:

- understanding displayed but an over-reliance on verbatim quoting, even though appropriate;
- resource material used but some information not as well exploited as it could be;
- largely related to the question but some irrelevant material introduced; and
- ideas not expressed particularly logically or clearly.

Level 1 ([1]–[3])

- Simple understanding demonstrated but sketchily dealt with;
- verbatim use of resources, sometimes not fully appropriate;
- some use made of the resource material but many relevant resources omitted; and
- little or no structure or logic in the ordering of content. [8]

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(ii) The Environment (Discuss the environmental damage of the proposed development and the counterarguments.)

The boundary of the protected area, the Norfolk Broads Special Area of Conservation, is just 2 kilometres to the northeast of the proposed eco-town (Resource B). This National Park contains rare habitats and is biodiverse with many plants and animals including endangered species and opponents of the proposed development are concerned that it may impact upon this area.

Water provision in this area is already under strain with existing populations and an increased population in the area to live in the 3,400 new houses in Rackheath will cause even more problems. There is no water available locally at times, according to the Environment Agency, and the additional need for water from the new population will exacerbate this situation further.

Rackheath is being built on a greenfield site, as Resource C shows. This is damaging to the environment, especially given that there are 27,000 hectares of brownfield land across the country which should be the favoured location of eco-towns before greenfield land is used. Eco-towns divert money away from other, more useful, environmental projects.

While even the new town's opponents concede that it is good to have houses that are zero carbon, they point out that the whole development is not zero carbon. Rackheath eco-town will not be self-sufficient and many of its residents will have to travel by car to Norwich or further afield for work. While some services are available in the new town, other goods and services will have to be travelled to, or transported to Rackheath either by car or train. While this will increase carbon emissions, it is also argued that it will produce chaos on the local roads. One local raised a concern that there would be "10-12,000 cars leaving for Norwich" each day, increasing traffic problems on the small rural roads around the town. Opponents voice the opinion that the eco-town's proposal may really be just an excuse to start to build three million new houses in the countryside of England and Wales, which would cause untold damage to the environment in their view. In any case, some environmental groups, such as the Green Party, have argued that it is important that all towns become environmentally friendly, not just those established as "eco-towns".

In the views of these opponents, Rackheath "eco-town" will actually result in an increase in road traffic along the Northern Distributor Road (NDR) and there is the suspicion that the eco-town is being used as the excuse to build the road. It will be massively polluting, generating 24,631 tonnes of carbon in the first year alone, with this rising in subsequent years. If the eco-town were not built, the need for the NDR would not be clear.

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The proponents of the scheme claim that development will actually enhance the environment. The heathland which was lost when the airfield was created in WWII will be restored and designed with water features to enhance biodiversity of the area. It will also provide a corridor for wildlife, linking Norwich to the Norfolk Broads. This is particularly important as, at present, the area around Rackheath is of low environmental quality, being used to grow potatoes, sugar beet and cereals (see Resource C2). A range of species will be supported by the eco-town and its green spaces including reptiles, newts, barn owns, bats and badgers.

The eco-town will also improve the environment by managing and reducing waste. There are targets to get recycling rates of 70% and to get 90% of organic material composted. The new settlement itself will use ground source heat pumps and biomass boilers in addition to wind power to produce energy and the houses will run entirely on this renewable energy.

Transport for the residents of Rackheath eco-town will also be carefully considered to reduce or eliminate impact on the environment through carbon emissions. Public transport will be developed to provide affordable alternatives to the use of private cars. There will be a new train station to the east of the settlement providing easy rail access to Norwich city centre and to other places of employment and services. These trains will run every 15 minutes at peak times and every 30 minutes at other times. The bus service too will be developed employing state-of-the-art GPS technology to help its users. No one in Rackheath will live more than 300 m from a bus stop and the aim is to have 65% of all journeys made in the eco-town non-car journeys. Other steps will be taken to reduce the number of driver-only journeys, which is currently 86%, to just 50%. This will be achieved by having affordable public transport and by the establishment of car clubs. There will also be cycle paths and walkways encouraging residents not to use vehicles for shopping and trips to work.

Those in favour of Rackheath eco-town also point to the steps taken to use water efficiently in the new settlement with each house or business having rainwater collection devices fitted. Residents will also be encouraged to grow their own vegetables using the 2.9 hectares of allotments spread around the settlement.

All of these efforts will, according to those in favour of the scheme, reduce CO_2 emissions in Rackheath eco-town by 80% over the next 40 years. This considerably exceeds the national target of the government and matches the target set by wildlife and conservation charities such as Friends of the Earth and the World Wildlife Fund.

AVAILABLE MARKS

Level 3 ([9]–[12])
Candidate states clearly the main beneficial effects and the counterarguments. **Two** or more different factors should be discussed. The account will have many of these characteristics:

- the points made will be consistently relevant and logically structured and will not stray beyond the local economy or, if they do, the local impact will be highlighted;
- the ideas will demonstrate insight and a level of sophistication;
- clear understanding of all concepts will be demonstrated;
- use will be made of most of the relevant resource material – no significant points will be omitted;
- figures, where available and appropriate, will be used to good effect; and
- ideas will be expressed clearly and effectively.

Level 2 ([5]–[8])
Candidate will have fewer lines of thought or discussion may be limited. However, while ideas may lack depth and/or detail, they are still adequate. There may be an imbalance between the two sides of the argument. The account may show deficiencies in the following ways:

- understanding displayed but an over-reliance on verbatim quoting, even though appropriate;
- resource material used but some information not as well exploited as it could be;
- largely related to the question but some irrelevant material introduced; and
- ideas not expressed particularly logically or clearly.

Level 1 ([1]–[4])

- Simple understanding demonstrated but sketchily dealt with;
- verbatim use of resources, sometimes not fully appropriately;
- some use made of the resource material but many relevant resources omitted; and
- little or no structure or logic in the ordering of content. [12]

	AVAILABLE MARKS

(c) Decision (State clearly your decision and justify it on the basis of the greater overall benefits.)

The recommendation may overlap with some of the points made in B with regards to people, economic and environmental impacts of the proposed development. However, the emphasis here has to be on the *greater overall benefits* of one option over the other. In this section, candidates can weigh up the relative merits of both positions. *No mark for stating a decision alone without a justification*.

Level 3 ([8]–[10])
Candidate states clearly a decision. A range of reasons are provided in justification. The account will have many of the following:

- there is evidence that the arguments of both sides are being balanced, one against the other;
- links are made between diverse aspects of resource material, not possible in B;
- points are consistently relevant and logically structured;
- there is a clear grasp of the concepts used.

Level 2 ([4]–[7])
Candidate states or clearly implies a decision. There are fewer lines of thought or discussion, but what is present is relevant and correct or supportable in what is argued.
There may be deficiencies such as:

- too much verbatim quoting or overuse of quotations in full;
- important sections of resource material not utilised;
- irrelevant material introduced;
- ideas not expressed particularly or clearly;
- understanding of concepts not always clearly demonstrated.

Level 1 ([1]–[3])

- Few lines of thought and sketchy in detail;
- large gaps in the use of resource material;
- little or no structure or logic in the ordering of the concepts. [10]

Format
Clear format headings **using the headings provided** throughout [1]
Clear subheadings **using the subheadings provided** in Section B [1] Headings and subheadings must be on a separate line. [2]

Role
Role adopted [1]
Role maintained [1] [2]

Graph
Reference in report [1]
Appropriateness of the technique used [1]
Accuracy of the data presented [3]
Conventions (key, labelled axes, title) [3] [8] 50

Section B **50**

Total **110**