



**General Certificate of Education**

**Geography 2030**  
*Specification*

**GEOG1 Physical and Human Geography**

**Mark Scheme**

**Post-Standardisation**

*2011 examination – January series*

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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**GEOG1, GEO4A and GEO4B General Guidance for GCE Geography Assistant Examiners****Marking – the philosophy**

Marking should be positive rather than negative.

**Mark schemes – layout and style**

The mark scheme for each question will have the following format:

- a) Notes for answers (nfa) – exemplars of the material that might be offered by candidates
- b) Mark scheme containing advice on the awarding of credit and levels indicators.

**Point marking and Levels marking**

- a) Questions with a mark range of 1-4 marks will be point marked.
- b) Levels will be used for all questions with a tariff of 5 marks and over.
- c) Two levels only for questions with a tariff of 5 to 8 marks.
- d) Three levels to be used for questions of 9 to 15 marks.

**Levels Marking – General Criteria**

Everyone involved in the levels marking process (examiners, teachers, students) should understand the criteria for moving from one level to the next – the “triggers”. The following general criteria are designed to assist all involved in determining into which band the quality of response should be placed. It is anticipated that candidates’ performances under the various elements will be broadly inter-related. Once the Level has been determined, examiners should initially set the mark at the middle of the mark range for that level (or the upper value where no mid value exists). Then refine the mark up or down using the General Criteria, Notes For Answers and the additional question specific levels guidance. Further development of these principles will be discussed during Standardisation meetings. In broad terms the levels will operate as follows:

**Level 1: attempts the question to some extent (basic)**

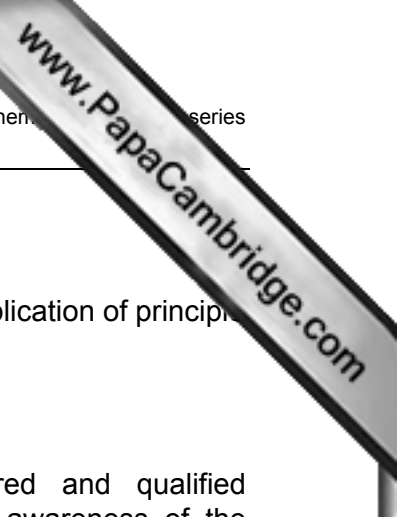
An answer at this level is likely to:

- display a basic understanding of the topic
- make one or two points without support of appropriate exemplification or application of principle
- demonstrate a simplistic style of writing perhaps lacking close relation to the terms of the question and unlikely to communicate complexity of subject matter
- lack organisation, relevance and specialist vocabulary
- demonstrate deficiencies in legibility, spelling, grammar and punctuation which detract from the clarity of meaning.

**Level 2: answers the question (well/clearly)**

An answer at this level is likely to:

- display a clear understanding of the topic
- make one or two points with support of appropriate exemplification and/or application of principle
- give a number of characteristics, reasons, attitudes (“more than one”) where the question requires it
- provide detailed use of case studies
- give responses to more than one command e.g. “describe and explain..”
- demonstrate a style of writing which matches the requirements of the question and acknowledges the potential complexity of the subject matter
- demonstrate relevance and coherence with appropriate use of specialist vocabulary
- demonstrate legibility of text, and qualities of spelling, grammar and punctuation which do not detract from the clarity of meaning.



**Level 3: answers the question very well (detailed)**

An answer at this level is likely to:

- display a detailed understanding of the topic
- make several points with support of appropriate exemplification and/or application of principles
- give a wide range of characteristics, reasons, attitudes, etc.
- provide highly detailed accounts of a range of case studies
- respond well to more than one command
- demonstrate evaluation, assessment and synthesis throughout
- demonstrate a sophisticated style of writing incorporating measured and qualified explanation and comment as required by the question and reflecting awareness of the complexity of subject matter and incompleteness/ tentativeness of explanation
- demonstrate a clear sense of purpose so that the responses are seen to closely relate to the requirements of the question with confident use of specialist vocabulary
- demonstrate legibility of text, and qualities of spelling, grammar and punctuation which contribute to complete clarity of meaning.

**CMI+ annotations**

- The annotation tool will be available for levels response questions.
- Where an answer is marked using a levels response scheme the examiner should annotate the script with 'L1', 'L2' or 'L3' at the point where that level has been reached. At each point where the answer reaches that level the appropriate levels indicator should be given. In addition examiners may want to indicate strong material by annotating the script as “Good Level...”. Further commentary may also be given at the end of the answer. Where an answer fails to achieve Level 1 zero marks should be given.
- Where answers do not require levels of response marking, the script should not be annotated. For point marked questions where no credit-worthy points are made, zero marks should be given.
- The following is a list of the annotations available on the CMI+ system:

**Generic**

ca	–	expl	– explanation
char	– characteristic	Ldfm	– landform (Section A)
con	– contrast	role	–
desc	– description	twe	– to what extent
e.g.	– (for) example		

Additional question specific annotations are shown in the mark scheme for each Levels marked question.

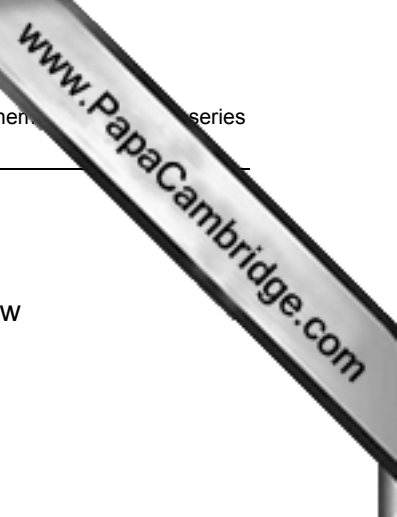
**Other mechanics of marking**

- Various codes may be used such as: ‘rep’ (repeated material), ‘va’ (vague), ‘NAQ’ (not answering question), ‘seen’, etc.
- Unless indicated otherwise, always mark text before marking maps and diagrams. Do not give double credit for the same point in text and diagrams.

**SECTION A**

**Question 1**

- 1 (a) (i)** Magnitude refers to the severity of floods. This idea is required for 1 mark. A further mark is for elaboration, with reference to size of area affected, amount of damage done, the fact that it can be used to predict the return period of a flood event of a particular scale in conjunction with frequency. An example may be used to illustrate.  
2×1. **(2 marks)**  
**AO1 – 2**
- 1 (a) (ii)** Response should recognise the following elements – there is a general reduction in the frequency of floods as the severity increases. This may be illustrated by reference to any valid figures relating discharge to recurrence interval (up to 2). Further mark(s) are permissible for recognising the clustering of events between 1 and 15 years and the relative infrequency of very small floods (less than 200 cumecs) and very large floods (more than 600 cumecs). **(3 marks)**  
**AO1 – 1**  
**AO2 – 1**  
**AO3 – 1**
- 1 (b) (i)** Meanders are the most obvious feature – these are quite sinuous. There is evidence of the build-up of material on the inside bend (to right of photo) forming a gentle slip-off slope. There are levées present following the river’s course. The meanders are surrounded by an extensive flat gently sloping area – the flood plain. The meander belt extends across this. The valley sides (bluffs/river cliffs) rise beyond the extent of the meander belt.  
Allow 2 marks for identification.  
There must be reference to at least two landforms.  
4x1. **(4 marks)**  
**AO1 – 1**  
**AO2 – 2**  
**AO3 – 1**
- 1 (b) (ii)** There is likely to be reference to flood plains (shown in Figure 2), ox-bow lakes (the subsequent stage from the meander development present); levées are also permissible as are bluffs and braided streams. Reference should be made to the specific role of flooding in formation, e.g. the development of levées when the river bursts its banks, the subsequent loss of energy and the deposition of material, beginning with the largest first. Subsequent flood events lead to the further build-up of the banks. The finer material is carried further to be deposited on the flood plain, leading to its aggradation. This process may be especially marked in deltas and channels may split, following flooding. There could be recognition that the meander is often cut off during times of flooding resulting in a straight course and the formation of an ox-bow lake. **(6 marks)**  
**AO1 – 3**  
**AO2 – 2**  
**AO3 – 1**



**Level 1 (1-4 marks)**

Identifies landforms at lower end.

Describes the formation of landform(s) such as flood plains, ox-bow lakes.

May be detail on one or a variety of landforms mentioned.

Some reference to flooding will be present at the higher end.

Some use of appropriate terminology present at the higher end.

**CMI annotation**

- **L1 Description of relevant landform(s)**
- **L1 Description of relevant landform(s)  
Some reference to flooding**

**Level 2 (5-6 marks)**

There is mention of two landforms.

Description is purposeful – related to flooding specifically.

The role of flooding in the formation of at least **one** landform is clear – link is made.

Appropriate geographical terminology is used.

**CMI annotation**

- **L2 Clearly links role of flooding to landform(s)**

**1 (c)**

Description should refer to channel characteristics such as cross profile, wetted perimeter, hydraulic radius, roughness and efficiency. There are links between some of these and to velocity, discharge and vertical erosion, lateral erosion and deposition processes. These will form the basis of explanation.

Description should identify the changing width, depth and shape of the cross section, the increasing wetted perimeter (but note the impact of boulders near the source), the increasing HR, decreasing roughness and increased efficiency.

Examples of content include the following:

Cross-profile – this refers to the width and the relative depth across the width. The relationship between these two will have a significant impact on the wetted perimeter – the length of the bed and banks in contact with the water. Near the source, this is likely to be small as the river is narrow and shallow, but will increase as the volume of water increases downstream. The relationship between these two characteristics is identified in the hydraulic radius (HR). This divides the cross-sectional area (determined by width × average depth) by the wetted perimeter. This is partly a measure of efficiency as the higher the HR the less water relatively there is in contact with the bed and banks in proportion to that away from them. Thus, there is less friction, greater velocity and greater energy left for erosion, transportation. The roughness of the channel – the extent to which there are large boulders or coarse material along the bed – affects the cross-sectional area, wetted perimeter and hydraulic radius. An increase in roughness will reduce velocity as a result of the need to overcome the increased contact and friction and so the river will be less efficient.

**(15 marks)**  
**AO1 – 7**  
**AO2 – 8**

Explanation should relate to velocity and discharge and how these change downstream. There may be reference to potential and kinetic energy and the importance of different processes such as vertical erosion near the source, the increasing prevalence of lateral erosion and the dominance of deposition in lower course.

**Level 1 (1-6 marks)**

Describes channel characteristics and how they change downstream. Description is of individual characteristics. Description is partial – explanation likely to be absent – one-sided. Some use of appropriate terminology present at the higher end.

**CMI annotation**

- **L1 Defines/describes channel characteristics**
- **L1 Desc changes of individual characteristics**

**Level 2 (7-12 marks)**

Description is more complete – begins to see links. Sequence is clear. Explanation begins to be addressed – with reference to process, energy, velocity, discharge. Appropriate geographical terminology is used.

**CMI annotation**

- **L2 Clear desc and expl - some links**

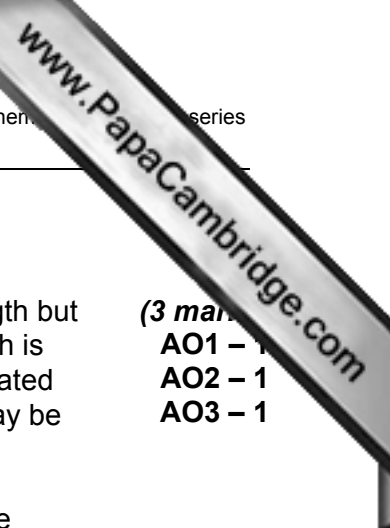
**Level 3 (13-15 marks)**

Precise description of changes in channel characteristics. Links are sequential and/or detailed. Explanation is integrated relating to velocity, discharge, energy, process. Appropriate terminology is used throughout.

**CMI annotation**

- **L3 Sequence, desc and expl are integrated - links clear, detailed**





**Question 2**

- 2 (a) (i)** All glaciers are retreating. Glaciers are retreating/shrinking in length but at different rates – with reference to evidence, e.g. Grosser Aletsch is retreating fastest and has lost approximately 2km. Pizol has retreated least in absolute terms – only 300m approximately. Reference may be made to the relative proportions of these – that Pizol has lost approximately one third of its length in contrast to Grosser Aletsch which has lost approximately one twelfth. Reference could also be made to the fluctuation apparent – especially in Trient with an increase during late 1980s and early 1990s.  
Must refer to trends – maximum 2 on any trend.  
3x1.
- (3 marks)**  
AO1 – 1  
AO2 – 1  
AO3 – 1
- 2 (a) (ii)** Answers are likely to relate to the glacial budget and a recognition that there is an overall loss of ice – negative mass balance as ablation exceeds accumulation. This may be related to the reduced length of the glacier as the snout appears further 'upstream'. There should be recognition of the time scale involved – that this is an ongoing trend repeated frequently during the 20<sup>th</sup> century so that glaciers have retreated. There may be reference to underlying reasons such as reasons why climate appears to be getting warmer – linked to natural cycles or global warming. (1 for recognition of global warming + 2 for underlying reasons).
- (4 marks)**  
AO1 – 4
- 2 (b) (i)** Figure 4a shows the temperature of a warm based glacier is much closer to 0°C. The surface summer temperature is positive, whereas the cold based glacier remains negative at approximately –15°C. In winter the surface temperature of the cold based glacier is approximately 12°C colder at 27. Throughout its depth, the warm based glacier remains near to 0 and the pressure melting point (PMP) whereas the cold based glacier temperature ranges between –10 and –27. At its base, the warm based glacier reaches the PMP, whereas the cold based one is at –10 and approximately 9 °C colder than required for the PMP.  
Maximum 2 for separate description.  
Maximum 1 if own knowledge only.  
3x1.
- (3 marks)**  
AO1 – 1  
AO2 – 1  
AO3 – 1



- 2 (b) (ii)** There are clues to the answer in Figure 4. The diagram indicates that the base of the warm based glacier has a temperature of  $-2^{\circ}\text{C}$  and that this is synonymous with the PMP. This is significant for the process of basal sliding where the weight of overlying ice causes some ice to melt, even though temperatures are below freezing. Subsequent movement causes friction, enhancing melting. This encourages the ice to move as it is not frozen to its base and the presence of water acts as a lubricant. Obstacles to the ice flow (especially small ones under a metre long) create added pressure on the ice as it begins to move over them. This causes melting at the PMP on the up-glacier side and the presence of meltwater aids the passage of the ice over the obstacle – this is known as regelation slip. (Regelation refers to the layer of ice where the process occurs at the base). Larger items are overcome by creep. Here, the ice does not melt, but acts more like a piece of plastic and moulds itself around the obstacle as the ice crystals change shape or deform.

**Level 1 (1-3 marks)**

Defines basal sliding.

Begins to explain.

Answer likely to be partial.

Figure 4 may not be used – but importance of meltwater will be present.

Sequence will be incomplete.

Some use of appropriate terminology present at the higher end.

**CMI annotation**

- **L1 Partial expl - basic idea**
- **L1 Partial expl - recognises meltwater**

**Level 2 (4-5 marks)**

Explanation is clear.

Sequence given so that how process occurs is clear.

Links are made to Figure 4 and the role of meltwater.

Adds exemplification to explain process, e.g. referring to how obstacles are overcome via regelation slip or creep.

Appropriate geographical terminology is used.

**CMI annotation**

- **L2 Sequence clear – links to meltwater and/or overcoming of obstacles**

2 (c)

**Fluvioglacial landforms** include meltwater channels, kames, eskers and outwash plains. A definition of term is a valid inclusion. Likely answer will begin with landforms resulting from erosion as this is first term.

**Meltwater channels** – also known as glacial overflow channels – are the product of **erosion**. These form as the original course followed by a river before glaciation may be blocked by ice or as an overflow from a proglacial lake (one that results from meltwater from glaciers). Large amounts of meltwater had much energy to erode and carve out deep gorges, that today are occupied by streams too small to have created the valleys they flow in. Examples are well documented – Newtondale and Lake Pickering, Lake Lapworth and Ironbridge Gorge.

**Eskers** – these are winding/sinuuous ridges of often coarse sands and gravels that are **deposited** by meltwater as it flowed in a channel beneath the glacier. Flow is under pressure and much material is carried, to be dropped when meltwater reduces in winter and exposed when the glacier melts. Material is rounded due to **water erosion**. They vary in height – 5-20m for small eskers and length – from a km to 400km (Munro esker in Canada).

**Kames** – are rounded mounds/hills of fluvioglacial deposits. These are found near the end of the former glacier as it began to retreat. Meltwater ponded back by terminal moraine led to formation of lakes and material was **deposited** where the meltwater left the glaciers to flow into lakes – creating delta-like landforms – when the ice supporting the up-valley side melted, the material collapsed back to form the kame. There is the suggestion that hollows on the surface of a melting glacier would fill up with sediment and then gradually go down to lower levels as the ice melted – ultimately forming a mound on the ground surface. Kettle holes/lakes may be referred to in the context of kames. Kame terraces are found where meltwater runs between the glacier and the sidewall and material is deposited (sorted) when flow is reduced.

**Outwash plains** – are areas that may have been glaciated by ice sheets and then affected by meltwater or they may be areas in front of the snout. When meltwater emerges from the snout, it loses its energy as it is no longer flowing under hydrostatic pressure. Consequently, the material it is carrying is **deposited** – the largest first often forming an alluvial fan at the end of the glacier. When a number of these merge – an outwash plain is formed. The material is in layers, reflecting the years and seasons and water available. Kettle lakes are a feature here and varves may also be mentioned. Braided streams are relevant here.

**Level 1 (1-6 marks)**

Describes formation of fluvioglacial landform(s).  
Likely to refer to depositional (or erosional) landform(s) only.  
Sequence of landform formation is partial.  
Points made are simple and random.

***CMI annotation***

- ***L1 Desc of formation - focus on deposition***

**Level 2 (7-12 marks)**

Likely to refer to deposition only.  
Considers links between process and landform – explanation is present.  
Points are clear and illustrated/developed at least in places.  
Tentative/implicit assessment based on evidence.

***CMI annotation***

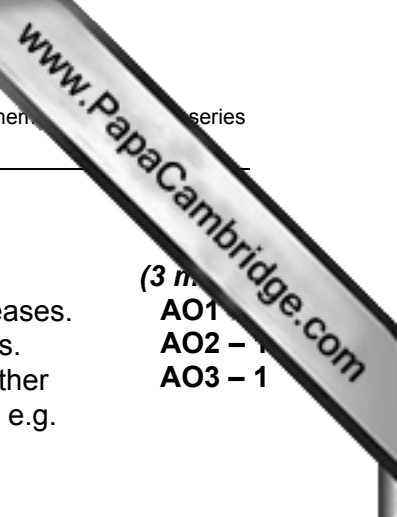
- ***L2 Links process and landform - some assessment***

**Level 3 (13-15 marks)**

Clear, purposeful explanation – process is thrust and links between process and landforms are to the fore.  
Will refer to both deposition and erosion in a more balanced response (although deposition likely to be to the fore). There may be reference only to the processes of erosion.  
Points are clear and illustrated/developed throughout.  
Clear/explicit assessment based on evidence.

***CMI annotation***

- ***L3 Sequential – considers deposition and erosion  
Clear assessment***



**Question 3**

- 3 (a) (i)** The size of beach material decreases along the beach to the east towards headland as percentage of material less than 10mm increases. The exception to this is at sites 5 and 8, where the percentage falls. The increase is in variable amounts – and these get bigger the further east the sampling points were. Evidence may be used in support, e.g. smallest increase between sites 1 and 2 of 1%, whereas greatest increase between sites 8 and 9 of 26%. (1 per valid item).  
3x1. **(3 marks)**  
AO1 – 1  
AO2 – 1  
AO3 – 1
- 3 (a) (ii)** Longshore drift is likely to be main response – 1 for process. Further elaboration with reference to the direction of movement in an easterly direction (as smaller size material carried further) and detail on process as to how it occurs with regard to swash and backwash. May also refer to increase in proportion of smaller material east as a result of attrition and abrasion (1 for naming both and 1 for development of what process entails and how it results in material being smaller). May seek to explain exceptions where collector error relevant. **(4 marks)**  
AO1 – 4
- 3 (b) (i)** Idea of change of height inland is worth 1 mark + 1 for elaboration. There should be recognition of increasing height with distance inland initially and subsequent reduction in height of grey dunes. Differences may be noted between the embryo and fore dunes or both of these and the main ridges. The reductions in height between the ridges may also be considered and the presence of slacks. Reference to changing colour of dunes, increased stability.  
3x1. 1 mark for appropriate use of evidence. **(3 marks)**  
AO1 – 1  
AO2 – 1  
AO3 – 1
- 3 (b) (ii)** The following conditions are required for the development of sand dunes – a wide range between high and low tide to expose a large area of sand; an abundant supply of sand on the beach that will provide the sand for the dunes (but decreases further inland so the ridges are of a lower height); a gentle beach profile; prevailing onshore winds to blow the sand from the beach inland; vegetation that will stabilise the sand in mounds – embryo dunes and facilitate the build-up of the dune ridges. There may be reference to the steeper slopes facing the wind where wind speed is greater in contrast to the more sheltered area on the leeward side where speed reduced after highest part crossed. Increased speed at the bottom of the slope leads to erosion and the formation of slacks. **(5 marks)**  
AO1 – 3  
AO2 – 2

**Level 1 (1-3 marks)**

Condition(s) necessary are identified/described.  
 Some simple explanation.  
 Some use of appropriate terminology present at the higher end.

**CMI annotation**

- **L1 Conditions identified**
- **L1 Some ref to expl**

**Level 2 (4-5 marks)**

Conditions are described and are linked to the development of sand dunes.  
 Explanation is clear.  
 Appropriate geographical terminology is used.

**CMI annotation**

- **L2 Clear on conditions and links to development**

**3 (c)**

A case study is required so responses will be determined partly by the case study used – textbooks for the specification refer to Towyn floods in 1990, 1953 storm surge and Hurricane Katrina. Myanmar/Burma is also a likely example, as is the Boxing Day/Indian Ocean tsunami. Case study identified can be of varying scales as indicated above.

**(15 marks)**  
**AO1 – 8**  
**AO2 – 7**

**Physical causes** – likely to refer to storm surges, linked to passage of deep depressions, high tides and high levels of runoff; tropical revolving storms (hurricanes/cyclones); tsunamis; climate change.

**Human causes** – likely to focus on rising sea levels due to global warming and people's role in this. The decisions made to build in vulnerable areas – such as London, New Orleans would also be valid and level of protection/preparation given.

**Physical consequences** – actual flooding of the land, impact on farmland – salt water contamination of the soil, breaching of levees.

**Human consequences** – are likely to be to the fore, given the hazardous nature of the event – and number of deaths, injuries, homes lost, people evacuated, insurance claims etc. are likely to be present.

Assessment likely to relate to relative importance of physical/human causes; physical/human consequences; causes verses consequences; physical cause versus human consequences.

If more than one case study is used, select the best for case study strand of mark scheme. Content of 2<sup>nd</sup>/3<sup>rd</sup> case studies should be considered with regard to cause and consequences.

**Level 1 (1-6 marks)**

Describes one/two causes.  
 Describes one/two consequences.  
 Likely to focus on one aspect.  
 Sections are seen separately.  
 Points made are simple and random.

***CMI annotation***

- ***L1 Desc of causes and/or consequences***
- ***L1 Generic/random points***

**Level 2 (7-12 marks)**

Some reference to both causes and consequences. May split into physical and human.  
 Begins to target content to purpose.  
 Likely to be imbalance.  
 Case study is present and information will be recognisable.  
 Tentative/implicit assessment of causes and consequences.

***CMI annotation***

- ***L2 Clear ref to causes and consequences***
- ***L2 Some ref to e.g./assessment***

**Level 3 (13-15 marks)**

Clear detailed causes and consequences. May identify physical and human – clear, purposeful structure.  
 Clear and purposeful in discussing causes and consequences.  
 Case study is specific and detailed.  
 Clear and supported/explicit assessment of causes and consequences.

***CMI annotation***

- ***L3 Detailed ref to causes, consequences and case study***
- ***L3 Explicit assessment***

**Question 4**

- 4 (a) (i)** These areas mainly occur between 30 degrees north and south of the Equator. With the exception of an area in east Africa, they are not found at the Equator. They are on the western sides of continents and extend inland to varying degrees – this is most limited in South America and most extensive cross North Africa, across the Middle East into Asia. The semi-arid areas are generally on the edges of the arid ones. These areas are most extensive in North Africa, Asia and Australia.  
3×1. **(3 marks)**  
AO1 – 1  
AO2 – 1  
AO3 – 1
- 4 (a) (ii)** There are a variety of reasons that might be considered – the presence of high pressure as a result of the areas being on the falling limbs of the Hadley and Ferrel cells and the stability of the air, thus the warming air means precipitation will not occur; prevailing winds are out-blowing from high pressure belt and so as they are land based do not contain moisture; the presence of cold currents off the western coasts results in winds coming across these precipitating over the sea; many of the areas are in rainshadow as a result of mountains elsewhere that have been crossed by prevailing winds earlier and many are substantial distances from the sea – the influence of continentality.  
4x1. Allow 1 mark for naming 2 factors. **(4 marks)**  
AO1 – 4
- 4 (b) (i)** The largest material – between 0.25 and 2mm rolls along the surface in a process known as surface creep. Intermediate size of 0.25 – 0.15mm hops along the surface at heights of up to a metre – saltation whilst the finest material of under 0.15mm is carried within the atmosphere – up to 300m via suspension.  
3×1. Allow 1 mark for identifying 2 processes. **(3 marks)**  
AO1 – 1  
AO2 – 1  
AO3 – 1
- 4 (b) (ii)** There is a clear link between suspension and deflation. Deflation occurs when the fine material is removed by the wind via suspension to leave behind a pebble strewn flat surface known as a desert pavement. Deflation hollows also result as material is picked up to create a basin shape. **(5 marks)**  
AO1 – 3  
AO2 – 2
- There is an equally clear link between saltation, suspension and abrasion. Material carried by the wind has a sandblasting effect on exposed rock surfaces, especially near the surface (1.5m). The material is carried and responsible for the abrasion process etches out areas of weakness – such as layers of soft rock to create landforms such as rock pedestals, yardangs and zeugen.



**Level 1 (1-3 marks)**

Describes the erosion processes.

Shows some awareness of what wind transport does. Implicit link.

Some use of appropriate terminology present at the higher end.

**CMI annotation**

- **L1 Desc of deflation or abrasion**
- **L1 Desc of both – some link to wind**

**Level 2 (4-5 marks)**

Explains clearly how transportation processes affect erosion processes – links explicit.

Both erosion processes needed for top of level.

Appropriate geographical terminology is used.

**CMI annotation**

- **L2 Clearly links process to role of wind**

4 (c)

**Landforms resulting from water action** include pediments, inselbergs, mesas and buttes, salt lakes, alluvial fans, wadis and badlands.

**(15 marks)**  
**AO1 – 8**  
**AO2 - 7**

**Erosion – pediments** – are extensive gentle slopes resulting from erosion at the foot of mountains. They are believed to have been formed by water erosion possibly by streams in wadis that change course regularly, sheetflow and the transport of weathered material from the slopes is another possibility.

**Inselbergs, mesas and buttes** are relict landforms of different sizes – these are left behind following erosion of the surrounding area. Chemical weathering is believed to have an important role in initial breakdown of the rock. This is due to rock being more resistant. Moving water in channels of varying sizes – wadis, gullies and rills – erodes the surrounding rock, as does sheetwash in times of rainstorms.

**Wadis** are gorge-like valleys cut by ephemeral streams in confined areas giving streams significant energy.

**Badlands** – are areas littered with a variety of features associated with deserts – there are many canyons separating areas of high land, the sides of which are often gullied. Wadis are a common feature. Canyons are a valid landform.

**Deposition –**

**Badlands** – are areas of soft, impermeable rock, littered with a variety of features associated with deserts – some of which are erosional and some of which relate to deposition – alluvial fans are common in them at the foot of steep slopes or where wadis emerge from the confines of their valleys.

**Alluvial fans** – these are cone shaped deposits of material left by intermittent streams – often at the end of wadis. These are known as bahadas where they join together.

**Salt lakes** – salination is a common process in arid areas – water drawn up to the surface contains dissolved salts such as sodium chloride and gypsum. When the water evaporates, the salt is left on the surface. Endoreic streams washing over the land transport the salt to lakes, where it is deposited when the lake dries up after rainfall.

There may be reference to landforms resulting from wind – such as mesas, buttes, yardangs, zeugen, dunes – in the context of assessing role of water in the formation of desert landforms.

**Level 1 (1-6 marks)**

Identifies source of water.

Describes formation of landform(s) resulting from water action.

Sequence of landform formation is partial.

Points made are simple and random.

**CMI annotation**

- **L1 Description of relevant landform(s)**

**Level 2 ( 7-12 marks)**

Begins to target content to purpose – begins to focus on process responsible.

May refer mainly to erosion or deposition - a clear imbalance.

Considers links between process and landform – explanation is present.

Points are clear and illustrated/developed at least in places.

Tentative/implicit assessment of role of water.

**CMI annotation**

- **L2 Begins to explain how water causes specific landforms.**
- **L2 Tentative assessment**

**Level 3 (13-15 marks)**

Clear, purposeful explanation – process is thrust and links between process and landforms are to the fore.

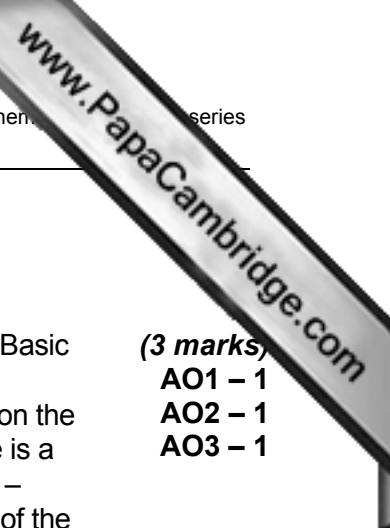
May consider landforms that are mainly the result of wind action and water unimportant.

Points are clear and illustrated/developed throughout.

Clear/explicit view assessment of role of water.

**CMI annotation**

- **L3 Clear explanation – links between process and landform**
- **L3 Clear assessment**



**SECTION B**

**Question 5**

**5 (a)** There should be recognition of uneven pattern / variation in density. Basic idea of high on coast low inland is worth 1 mark. Areas of highest density – above 700 per square km are exclusively on the east coast. There is a general reduction westwards. However, there is a band inland from the coast that is marked by relatively high densities – between 300-700, including provinces on Henan and Hunan. Some of the eastern coastal areas are relatively low – between 100 and 299 – these form a clear area in the east, south of Shanghai. The lowest densities are without exception to the north and west. Allow 1 for evidence – maybe number or place to support point made. 3×1. **(3 marks)**  
**AO1 – 1**  
**AO2 – 1**  
**AO3 – 1**

**5 (b)** The question refers specifically to density, so responses relating to population structure are not relevant. Answers likely to consider natural change resulting from relationship between births and deaths – so that a surplus of births over deaths will result in an increase. Migration change is also relevant – and the relationship between levels of people moving in and those moving out to determine net gain or loss. The underlying reasons for changes in the death, birth and migration rates could also form a legitimate part of an answer. There may be reference to change within an area and reference to a case study. **(5 marks)**  
**AO1 – 3**  
**AO2 – 2**

**Level 1 (1-3 marks)**

Identifies components of population change.  
 Statements are separate.  
 Emphasis is likely to be on one component.

**CMI annotation**

- **L1 Some reference to either natural or migration change**

**Level 2 (4-5 marks)**

The contribution of individual component(s) to changes in population density is clear.  
 Links are made and sequence of events is clear.  
 Appropriate terminology is used.

**CMI annotation**

- **L2 Clear reference to natural and/or migration change - links to density.**

5 (c)

Sustainability in the context of development may be viewed with reference to either economic and/or environmental implications. There is evidence that can be used in support of sustainable development as the narrowing of the pyramid shows that the young dependent population is reducing. This indicates a slowing of growth rates and population of more manageable levels. This would reflect in a possible reduced demand for resources or a more feasible level of growth to ensure appropriate living standards without putting as much pressure on the environment. In the 2000 pyramid the size of the independent sector is large and the pyramid tapers to the top, suggesting the fact that the population can support itself. However, when the 2050 projection is also considered, it becomes apparent that the population is ageing and the pyramid becomes top heavy. There are implications relating to sustainability here as there is a reducing number of people in the independent sector and children – so there is a long term issue for sustainable development due to the demands of the elderly and a high dependency ratio at this end – perhaps with an inadequate number of children.

There may be reference to own knowledge also which may refer to China, but need not do so. It is also permissible to look at pronatalist policies and those relating to migration in the evaluation of the information in the pyramid.

**Level 1 (1-4 marks)**

Describes population pyramids – refers to changes.

May refer to own knowledge of population policies.

Sustainable development defined/described.

***CMI annotation***

- ***L1 Describes structure separately***
- ***L1 Describes changes***
- ***L1 Tentative reference to sustainable development***

**Level 2 (5-7 marks)**

Response targets question.

Different components are linked so that information in pyramids is used to assess whether sustainable development is facilitated.

Own knowledge may also be present and is used to make points relating to sustainability.

Comes to a view on to what extent.

***CMI annotation***

- ***L2 Clearly links changing structure to sustainable development***
- ***L2 To what extent clear***

5 (d)

Response will depend on content covered and whether population increase or decrease is main focus as will links to migration. Question demands that positive and negative effects of change be considered in the two areas – countryside and cities. This should give the answer a structure. It is likely that content will be influenced by the two settlement case studies that have been undertaken, a diverse range of responses is likely – relating to migration, squatter settlements etc.

**Increase – rural** – likely to refer to rural-urban fringe locations and changes in suburbanised villages regarding age structure, socio-economic groups, income, car ownership; changes in housing and house prices, services, community and possible conflict between newcomers and original inhabitants. Response needs to make clear what represents change for the better such as more varied, high order services and those that are for the worse, such as the loss of basic, specialised food services such as butchers and greengrocers as incoming population are more mobile.

**Decrease – rural** – likely to refer to loss of services, including basic ones such as post offices, general stores as population falls, the loss of young population due to migration, leaving older behind, the importance of second home ownership and the implications of this, the need for diversification in farming, areas falling into disrepair. Likely changes here will focus on change for the worse – should be clear from response.

**Increase – urban** leads to rapid growth – urban sprawl on edges – large areas of housing of varying quality; increase in demand for services – in CBD, in new retail areas throughout city, increasing social and economic problems, increase in ethnic mix leading to multicultural societies, increase in inner city and CBD edge due to redevelopment, gentrification. Changes could be viewed as for better and/or worse depending on those included.

**Decrease – urban** – leads to areas becoming rundown and neglected, leaves behind deprived areas of society – poorest, elderly, single parent families, reduces service base, leads to downward spiral that makes investment unlikely. Likely to relate to parts of city – inner area rather than city as a whole.

The response expected are in the context of the UK, but content from other areas is equally valid as long as question is targeted.

#### **Level 1 (1-6 marks)**

Describes the character of areas that are increasing or decreasing.

May focus on either urban or rural.

Better or worse may be mentioned.

General simple statements.

#### ***CMI annotation***

- ***L1 Description of changes of rural and/or urban areas with increasing or decreasing population***

**Level 2 (7-12 marks)**

Links the changing character of areas to either changes for the better and/or worse.

Some discussion, debate.

May be imbalance, but urban and rural are both considered at the top end.

Some developed, illustrated statements.

***CMI annotation***

- ***L2 Links changes to increasing/decreasing population***
- ***L2 Begins to discuss and to relate to better/worse***

**Level 3 (13-15 marks)**

Response is purposeful in linking changes in the character of areas that are increasing or decreasing to whether changes are for the better or worse.

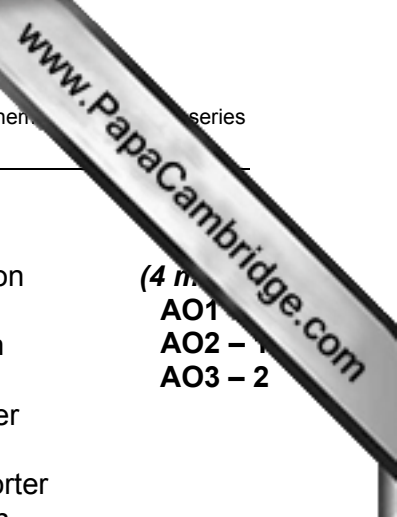
Discussion, debate is present.

Both urban and rural are considered in a more balanced account.

Developed, illustrated statements.

***CMI annotation***

- ***L3 Clearly links changes in population to that of rural and urban areas.***
- ***L3 Discussion to the fore***



**Question 6**

**6 (a) (i)** There is no requirement to give specific country names, but location intended should be clear from description.  
 The areas that are the highest net importers are clustered in North Africa and Arabian peninsula. Elsewhere the highest category is scattered, including rich countries such as Japan, Spain and poorer areas such as Zambia. All of Africa (except Zimbabwe and South Africa) is a net importer of food. The majority of Asia is a net importer with the exception of countries in the south such as India, Pakistan. The highest net exporters include a widespread and diverse area, including North America, Australia and Argentina and Uruguay in South America. There are a limited number of countries in Europe that are net exporters – France being the most obvious with 50%+.  
 The above represent possible statements: many other possibilities are apparent. Allow 4x1 for description of pattern, which should seek to establish key contrasts between net importers and net exporters in distribution. The focus must be on the pattern, supported by evidence. Exceptions are a valid aspect of pattern.

(4 marks)  
 AO1 – 1  
 AO2 – 1  
 AO3 – 2

**6 (a) (ii)** Countries are net importers of food because they have large numbers of people/high densities and cannot produce enough food to meet demand;  
 farming systems may be extensive;  
 the environment is harsh – too dry, too mountainous to allow adequate growth;  
 some food may be given as aid to overcome famine, e.g. North Africa;  
 they cannot grow certain foodstuffs, e.g. tropical fruits coming into UK;  
 they cannot produce certain foodstuffs in sufficient quantity, e.g. meat in UK;  
 there is a demand for out-of-season produce.

(5 marks)  
 AO1 – 3  
 AO2 – 2

**Level 1 (1-3 marks)**

Some reasons are suggested.  
 Statements are simple and separate.  
 May be one reason with some development or a list-like approach.

**CMI annotation**

- **L1 Simple, separate reasons**

**Level 2 (4-5 marks)**

Develops reasons.  
 Statements are linked and sequential.  
 Refers to more than one reason – may offer illustration using Figure 11 as stimulus.

**CMI annotation**

- **L2 Clear reasons, links made**



**6 (b)**

There may be a definition of genetic modification – the intervention by people to produce a plant that has certain (desirable) characteristics by manipulating DNA – transferring the material from one plant to another. This leads to potential increase in food supply as injecting genes of a variety resistant to a specific pest will mean that the injected variety becomes resistant; the same is true of a particular strain resistant to disease. These both clearly mean that the food supply will increase as crops will survive/not be eaten in similar environments whereas at one time they would have been. Similarly high yielding varieties can be introduced that require less water – Monsanto, the world's leading GM food producer, has said that seeds would be available by 2030 that would double yields of maize and soya beans. If such promises can be delivered and plants engineered to grow in areas of limited rainfall, areas at present not cultivatable could potentially become so – increasing food production further.

**Level 1 (1-4 marks)**

Describes some features of GM crops.

Tentative explanation of how food supply can be increased.

**CMI annotation**

- **L1 Describes GM crops**
- **L1 Begins to explain**

**Level 2 (5-6 marks)**

Clear and purposeful explanation demonstrating an understanding of GM crops.

Sees the two aspects in a linked way.

**CMI annotation**

- **L2 Explanation clear – links GM crops to food supply increase**

**6 (c)**

**Organic produce** – is that which is produced 'naturally' – largely without the use of chemicals, artificial fertilisers and food additives; animals should be kept in appropriate conditions of space and food. Fertilisers must be items such as manure, nitrogen fixing crops such as clover and fertility is encouraged by crop rotation. These methods may be seen as environmentally friendly as they do not use potentially harmful chemicals in pesticides and herbicides and so are kinder to wildlife and ecosystems as is the rotation practised. There is greater species diversity in areas of organic farming as a result. Less energy is used in production of foodstuffs, so cutting down on pollution as does the fact that less packaging is generally used. The fact that there is greater diversity in shape and size could also be seen to be environmentally friendly, rather than the mass production sector that relies on chemicals. The labour intensive nature of some aspects, such as weeding if necessary and the fact that yields are much lower than with 'traditional' ways of farming means that people choosing to buy such produce tend to pay more – even when sold in larger supermarket chains – so this may be viewed as economically unfriendly as may the reduction in intensity overall.

**(15 marks)****AO1 – 8****AO2 – 7**

**Locally-sourced food** – it is increasingly the case that the major supermarket chains identify the origin of food items – flagging up that that has come from with a county and possibly the specific farm of origin. Restaurants are increasingly doing the same. This clearly supports the local economy and farmers trying to make a living, rather than bringing in produce from the other side of the country or the world. The savings in transport and environmental pollution can be substantial – although this may need to be weighted against the costs of storing certain items for many months before they reach the shelves, e.g. apples. The same is true of farmers' markets where farmers sell produce directly to customers in a variety of temporary venues – allowing a greater range of produce to be on display and encouraging diversification and choice of product on sale. There may be reference to disadvantages to poorer countries if locally sourced food reduces demand for high value exports.

**Level 1 (1-6 marks)**

Describes either organic farming or local/regional sourcing of food. Points made are simple and in a random sequence.

**CMI annotation**

- **L1 Describes features of organic production and/or local farming of food**

**Level 2 (7-12 marks)**

Begins to link organic farming and/or local/regional sourcing of food to the notion of being environmentally and/or economically beneficial. Begins to target information to purpose in an ordered response. Points are made with some development/support. Tentative/implicit assessment of 'to what extent'.

**CMI annotation**

- **L2 Begins to link increase in demand for organic or local produce to environmental or economic advantages**
- **L2 Begins to link increase in demand for organic or local produce to environmental or economic advantages with some support and to what extent**

**Level 3 (13-15 marks)**

Clear, purposeful summary of organic farming and local/regional sourcing of food and links clearly to the context of environmentally and economically beneficial. Points are developed/supported throughout. Clear, explicit assessment of 'to what extent'.

**CMI annotation**

- **L3 Clearly links organic and locally found food to environmental and economic advantages**
- **L3 Explicit to what extent**

**Question 7**

- 7 (a) (i)** The proven oil reserve has increased (+ 1 for qualification – for example – by about 330 thousand million barrels between 1987 and 2007/by about a third of that in 1987).

(4 marks)  
AO1 – 1  
AO2 – 1  
AO3 – 2

Europe and Eurasia has seen the biggest increase – an increase of just under a third of its reserves in 1987 in percentage terms. This is similar in actual numbers to Africa. South America and Central America have seen a slower increase – of 20%. Asia Pacific has seen a decrease of 25% and remains the region with the smallest proven reserves. North America has seen the biggest reduction of proven reserves – approaching 50%. The above represent possible statements; many other ways of expressing similar ideas are apparent.

These are using percentages given; reference may be made to actual values that can be calculated from information given e.g. 75.5 thousand million in 1987 → 143.6 in 2007, so proven oil reserves have nearly doubled in actual numbers for Europe and Eurasia.

4x1

- 7 (a) (ii)** There may be recognition that prediction is relatively short and that it appears to go against the trend identified in part (a). Responses are likely to focus on the increase in world population and inherent demand; the increase in industrialisation in certain countries and therefore increase in demand; an increasingly affluent society demanding greater mobility in terms of private car transport and global air travel and greater possession of goods that use electricity. Conversely, there is the supply angle to consider – at present it is difficult to foresee that technology will increase to identify and extract reserves that are entirely unknown at present and will allow better extraction on newer fields; some reserves are found in areas that are protected – Antarctica and so exploitation is not possible.

(5 marks)  
AO1 – 3  
AO2 – 2

**Level 1 (1-3 marks)**

Identifies reasons why oil may run out.

Simple statements.

Likely to relate to reasons for increased demand.

**CMI annotation**

- **L1 Suggests simple reasons**

**Level 2 (4-5 marks)**

Develops points – statements are linked.

Understands why demand will increase, e.g. explains the significance of increasing population.

Will develop demand angle and/or consider aspects of supply.

**CMI annotation**

- **L2 Develops points, links and explains reasons**

7 (b)

Biomass refers to living and decaying living matter. Some of this can be used to produce energy – as in use of fuelwood in Sahel. However, modern biofuels supplied by planting designated areas in Brazil with sugar cane to produce ethanol or the growth of miscanthus (tall, woody grass) and willow in UK are converted into gas before producing electricity. Advantages likely to include reference to the renewable nature of the resource; its relative availability; its reduced effect on the environment – plants absorb carbon dioxide during growth and emit oxygen; when burnt carbon dioxide is released into atmosphere but on a smaller scale than fossil fuels and as part of a cycle; its potential to be a cheaper option than oil, especially as reserves reduce – or in connection with political situations, creating uncertainty in supply – not the case with biofuels. Disadvantages relate to the loss of land for food production – in Brazil, it is reported that food prices have gone up by at least 3%, some sources (IMF) suggest 30%, there are implications for overall levels of food supply; rainforest is being chopped down at times to make way for sugar cane; new system is one of monoculture – with associated disadvantages and production is likely to be increasingly intensive – involving use of high levels of artificial fertilisers and pesticides.

Comment may refer to biomass/biofuels as being more environmentally friendly; it won't run out in contrast to oil; the issue of taking away land from food production.

**Level 1 (1-4 marks)**

Understands what biomass is and how it generates energy.  
Identifies either advantages and/or disadvantages.

***CMI annotation***

- ***L1 Describes biomass.***
- ***L1 Gives simple advantages and/or disadvantages***

**Level 2 (5-6 marks)**

Is aware of advantages and disadvantages.  
Points are clear and developed.  
Some comment on either advantages or disadvantages.

***CMI annotation***

- ***L2 Clear description of advantages/disadvantages.  
Some comment***

7 (c)

Content should show understanding of the concept of sustainable with regard to extent to which the environment is not damaged as a result of use of resource and lifetime of resources – nuclear power predicted at 1000 years.

In terms of **lifetime** – and sustainability in this context – 1000 years is substantially longer than lifetime of fossil fuels, especially oil that is predicted at 50 years and this may be discussed with regard to long term investment, security etc. It is also less concentrated than these fuels and so offers more opportunities to a wider area of the world. In contrast to renewable sources, the lifetime is short, but the technology is currently more available and consequently cheaper.

In terms of **environment** – this is likely to include a discussion of the relative merits of nuclear fuel with regard to fossil fuels and its reduced pollution in terms of greenhouse gases and thus less impact in terms of both acid rain and global warming. Conversely, it is more polluting in this context than renewable sources – and discussion of these may follow. However, nuclear power provokes an often negative image environmentally with past disasters such as Chernobyl (there may be a discussion of this) coming to the fore as does the issue of managing waste from the reactors. This is likely to be a central part of the answer – with reference to the need to dispose safely of radioactive waste that remains radioactive for many years – thousands of years. There are risks involved in transportation to 'safe' sites and many of these are not permanent, given the time scale involved. In the UK, the radioactive waste that cannot be used is stored in steel clad containers in Sellafield. There are issues with this, such as impact on local population and potential increased risk of cancer, impact on fish in the Irish Sea, issue of terrorist attacks. Equally, there are issues regarding the future disposal of waste – current thinking is looking at burying waste in geologically sound sites at a depth of between 200-1000 metres in a variety of rock types, including clays and salts, but this is for the future at least 15-20 years and would look at a lifetime of 100 years for a waste product that retains its radioactivity for thousands.

**Level 1 (1-6 marks)**

Simple statements describe features of nuclear power.

Likely to describe nuclear waste and how it is dealt with.

Limited support.

Links to question are tentative.

***CMI annotation***

- ***L1 Describes characteristics of nuclear power***
- ***L1 Some reference to nuclear waste***

**Level 2 (7-12 marks)**

Begins to develop points and sequence them.

Offers some support.

Engages with theme and considers links to environmental sustainability.

Tentative/implicit discussion/debate of issues.

***CMI annotation***

- ***L2 Begins to link nuclear power to environmental sust.***
- ***L2 Begins to link nuclear power to environmental sust. plus some comment/debate***

**Level 3 (13-15 marks)**

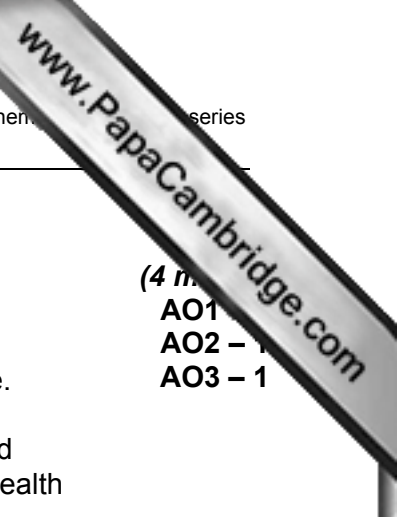
Develops points and sequences them.

Purposeful response with support present.

Focus is on sustainability and addresses environmental aspect purposefully.

Clear/explicit discussion/debate of issues.

- ***L3 Purposeful discussion on how/whether nuclear power can be managed to be environmental and sustainable – clear explicit debate/comment***



**Question 8**

**8 (a) (i)** There is no requirement to give specific regional / area names but location should be clear from description.

Description of pattern should seek to establish key aspects of the pattern. The focus must be on the pattern, supported by evidence. Exceptions are a valid aspect of pattern.

Areas with the highest incidence of poor health (between 11.9 and 16.5) are exclusively in south Wales. Areas where rates of poor health are relatively high (9.1-11.8) allow the identification of the main conurbations in the north of England/Tyneside, South Yorkshire, Greater Manchester, Merseyside. Areas of north Wales also come into this category. Generally, rates can be seen to be higher in the north and west. The median values (7.4-9.0) include an area cutting across central England and parts of the north. Areas with the lowest incidence are found in a belt from south west of The Wash, going south west to the south coast, (excluding London) but including many surrounding counties to the west. The South East has the lowest rates overall – all areas in the two lowest categories. Wales has poorer health than England.

The above represent possible statements; many other possibilities are apparent.

1 for higher in north, lower in south + 1 for evidence of this.

4x1.

(4 marks)  
AO1 – 1  
AO2 – 1  
AO3 – 1

**8 (a) (ii)** Answers will vary depending on which aspects of the two figures candidates focus on. For example, an expected approach would be to consider areas with high percentage of people reporting poor health and relatively low numbers of doctors per 10000 population; the reverse would also be expected and then exceptions to this. There are incidence where fewest doctors equates with highest proportion reporting poor health – e.g. areas of south Wales, but this is by no means an exact match between the two areas on the maps. Areas with the largest number of doctors (between 31.1 and 55.9) partly fits with the areas west of London with the lowest rates of poor health – but there are areas also with a middle level on the poor health category such as southern coastal area of south Wales and London. Some areas reporting a relatively high incidence of poor health such as Greater Manchester and Merseyside, also have relatively high numbers of doctors. Conversely, there are areas with relatively low incidence of poor health that have relatively few doctors such as central part of south.

(5 marks)  
AO1 – 2  
AO2 – 2  
AO3 – 1

**Level 1 (1-3 marks)**

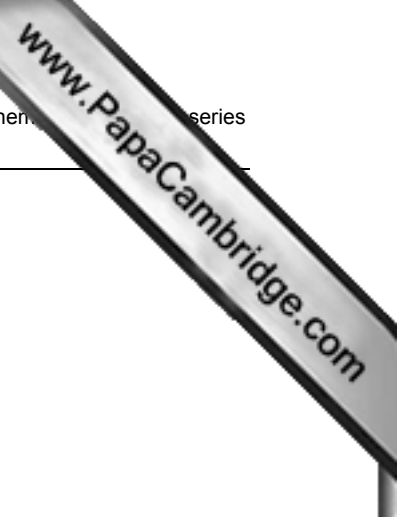
Describes Figure 14.

Some tentative/links between Figure 13 and 14.

**CMI annotation**

- **L1 Describes Figure 14**
- **L1 Occasional link with Figure 13**





**Level 2 (4-5 marks)**

Relates to both Figures 13 and 14.

Clearly describes links between the two figures – supports with evidence.

**CMI annotation**

- **L2 Describes relationships**

**8 (b)**

There should be reference to at least two reasons that affect health in the UK. The specification refers to age structure, income, occupation type, education, environment and pollution.

Age structure – a greater proportion of elderly people is likely to be linked to rates of ill health as certain diseases are associated with age – partly CHD, cancers or a general feeling of being less well.

Income can be related to access to healthcare, especially private healthcare and general well-being – access to leisure facilities etc.

Occupation type relates to a variety of possible values and attitudes – it is likely that people with working class jobs smoke more than those who are professional and this will have a direct impact on health.

Education can have a specific effect on health matters – in terms of smoking, consuming alcohol, diet and seeking to take exercise and the impact that these have on people's health.

Environment may result in a feeling of depression if poor quality urban area is lived in; the community in an area and the appearance of surroundings have a real bearing on how people feel.

Pollution may be seen to be linked to health – people living in cities where air quality can be poor are more likely to suffer from asthma and breathing related problems.

**(6 marks)**

**AO1 – 4**

**AO2 – 2**

**Level 1 (1-4 marks)**

Identifies factors that cause variations in health.

General points with limited support.

**CMI annotation**

- **L1 Suggests simple reasons**
- **L1 Suggests simple reasons and offers some basic support**

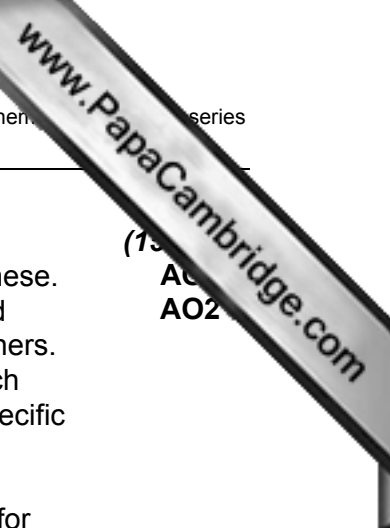
**Level 2 (5-6 marks)**

Clearly explains how 2 or more reasons result in regional variations in health.

Specific, elaborated points with support.

**CMI annotation**

- **L2 Clearly explains reasons for variations with support**



8 (c)

It is likely that candidates will have considered examples of pharmaceutical transnationals and so answer is likely to refer to these. GlaxoSmithKline is the largest UK based pharmaceutical TNC and other possibilities are Pfizer, Johnson & Johnson, Novartis and others. The response will depend on content they have considered – which could be diverse given all that is available on the internet using specific companies.

**Research** – this is a critical sphere as it is this that is responsible for finding drugs that act as cures/offset symptoms of diseases. Thus, drugs to offset impact of HIV/Aids have evolved. Most research is into diseases of affluence so CHD and cancer, high blood pressure that affect many people in richer areas of the world attract a lot of investment for research and drug development. Diseases that affect many in poorer areas such as malaria receive less. However, GSK do tackle this and HIV/Aids and TB – and there is clearly a need for this, given numbers affected, its debilitating impact and rates of spread.

**Production** – many drugs are sold under different names – those sold by major pharmaceutical companies directly (the designer label versions) are more expensive than the copies – that perform the same function – at affordable prices. WHO provides a list of such drugs – under their actual technical name, rather than that used to market them by big brand name companies. This has led to court action having been taken in the US – so answers may relate to the purpose of production – to improve health of population or for profit.

**Distribution** – many companies target doctors with regard to selling their products rather than the patients – and they are sold principally for profit. Often symptoms are treated rather than the cause – as this is more lucrative – so iron tablets are manufactured rather than changing the diet of sufferers and ensuring they eat green vegetables. The presence of drugs that are made but are not available to poorer countries is an issue – as HIV/Aids sufferers in poorer countries cannot access treatment. GSK provided 206 million tablets at special prices to poorer countries, including 120 million of these generically made. Comment may refer to relative numbers affected; relative wealth and investment; the global availability of drugs and research on an equal footing; determined by disease or by those who can pay or exert most pressure?

**Level 1 (1-6 marks)**

Describes pharmaceutical TNCs and their research and/or production and/or distribution.

Limited support.

Points may be random.

Generic TNCs

***CMI annotation***

- ***L1 Describes characteristics of pharmaceutical TNCs.***
- ***L1 Describes characteristics of pharmaceutical TNCs with some limited support***

**Level 2 (7-12 marks)**

Begins to develop points with reference to role of TNCs in researching/producing or distributing drugs – Notes issues for top of level. Support is present – reference to companies/strategies. Tentative, implicit discussion.

***CMI annotation***

- ***L2 Describes role of pharmaceutical TNCs in researching/producing/distributing drugs***
- ***L2 Describes role of pharmaceutical TNCs in researching/producing/distributing drugs and begins to debate/discuss***

**Level 3 (13-15 marks)**

Clear, purposeful awareness of role of TNCs in at least two aspects – but need not be entirely balanced. Response is precise, elaborated – and focussed on issues. Clear, explicit comment.

***CMI annotation***

- ***L3 Considers at least two aspects and debates/discusses issues***