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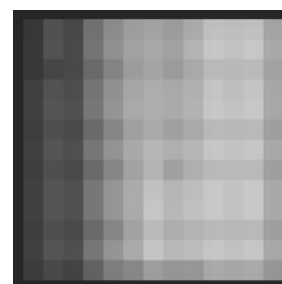
OCR

RECOGNISING ACHIEVEMENT

ADVANCED GCE   **A2 7832**

ADVANCED SUBSIDIARY GCE   **AS 3832**

GEOGRAPHY SPECIFICATION A

AS/A2

COMBINED MARK SCHEME
AND REPORT FOR THE UNITS
JANUARY 2005

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The report on the Examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the syllabus content, of the operation of the scheme of assessment and of the application of assessment criteria.

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Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annersley
NOTTINGHAM
NG15 0DL

Telephone: 0870 870 6622
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MARK SCHEME ON THE UNITS

REPORT ON THE UNITS

Mark Scheme 2680
January 2005

Hydrological Systems

1   Study fig 1 (insert) which shows two storm hydrographs for Canons Brook, Harlow in Essex for the years 1950 and 1960 after two similar rainfall events. During this time there has been urban development of the catchment.

What is meant by the terms:

(a) (i)   discharge?   [2]

Discharge is the volume/amount of water passing a certain point over a given period of time. It is usually measured in cumecs.

Accept the following:
The formula (2)
Amount of water in the channel plus units (2)
Amount + movement (1)
Amount of water flowing down a channel (1)

(ii)   lag time?   [2]

This is the difference in time (1) between the peak rainfall of a storm event and the peak discharge of a river (1).

Difference between peak discharge and peak precipitation (1)
Difference in time from the start of the storm to the peak discharge (1).

(b) (i)   Compare the two storm hydrographs shown in Fig 1.   **[6]**

Indicative content: candidates should compare the peak discharges and the lag time. The shape of the two hydrographs should also be noted for full marks. Direct reference must be made to the figures for level two.   In 1960 the discharge curve is far steeper, peak discharge of 8 cumecs and a steeper descending limb. In 1950 during development there is a slightly longer lag time and a more gentle rising limb.

Level 2 (5-6 marks): direct comparison of one element is made with use of the data from the graph. The 6th mark is for the development of a difference or use of information.

Level 1 (0-4 marks): consists of a series of statements of varying detail and accuracy without direct comparison being made. Comparison with no reference to the graph data will reach the top of this level. Description of the two hydrographs separately without clear comparison will also reach the top of this level.

(ii)   Explain the differences in discharge between 1950 and 1960.   **[6]**

Indicative content: reference should be made to the increasing amount of impermeable surfaces leading to reduced lag time as water is transferred more readily; the installation of drainage system also reduces the lag time. The soil store is reduced and so peak discharge increases. In 1950 there is more vegetation present which will mean greater interception, more infiltration and throughflow, all of which will lengthen the lag time and reduce the peak discharge. The hydrograph is more subdued.

Level two (5-6 marks): candidates explain fully the reasons for the differences in discharge.

Level one (0-4 marks): candidates suggest reasons for the differences but they are not fully developed. Inaccurate use of geographical language.

(c)   With reference to <u>one</u> or more named drainage basins, describe and explain measures, which may be taken to control the discharge of a river.   [10]

Indicative content: Methods of controlling a river's discharge may include: the construction of dams, lining of channels, flood retention basin, levees, weirs, sluice gates, overflow channels, afforestation, channel straightening, wing dykes (although the effect on discharge must be clarified), channel lining.

Level three (8-10 marks): candidates describe and explain in detail and link this back to the change of discharge. There is detailed reference to one or more examples and geographical terminology is used confidently and accurately.

Level two (5-7 marks): candidates describe and there is development in terms of either explanation or reference to the impact on a river's discharge.   Reference to place is more detailed and geographical terminology is used more accurately.

Level one (0-4 marks): candidates describe how discharge might be controlled. Explanation is absent. Limited reference to place and inaccurate use of geographical terminology. Bottom of the level may be no more than a list.

A maximum of 7 marks if there is no specific reference to place.

Ecosystems

2   Study Fig.2 (insert), which shows global net primary productivity

(a) (i)   What is meant by the term net primary productivity?   [2]

Net primary productivity is the rate at which vegetation grows. It is expressed in weight of organic matter produced per unit of area per unit of time e.g. $kg/m^2/yr$, $g/m^2/a$.

This is the amount of energy (1) minus the energy lost during respiration (1)

Accept the amount of plant tissue created (1)
GPP – respiration (1)
There should be an idea of productivity being explained.

(a) (ii)   Describe the pattern of net primary productivity shown in Fig. 2.   [4]

Indicative content: Areas of highest NPP are located in low latitude areas, between 30° N&S of the equator. Continental interiors there are of low productivity (e.g. Sahara, Australian Desert) and the polar areas are of the lowest NPP (e.g. Greenland, Antarctica).
There are some exceptions, e.g. SE USA which is just outside the tropics which are of high NPP, whilst western South America is extremely low NPP.

Level two (3-4 marks): candidates describe in detail the general pattern with clear reference to the map. No reference to a pattern but good use of the map has a maximum of 3 marks. Reference is made to anomalies at the top end of this level.

Level one (0-2 marks): candidates recognize areas of high and low NPP.

Study Fig. 3 (insert), which shows the trophic pyramid of an ecosystem.

(b) (i) What is meant by the term primary consumer? **[2]**

These are organisms that feed directly on producers (1), with a reference to a trophic level (1).

Herbivores (1)
Some omnivores (1)
Credit the idea of it being the first part of the food chain being consumed; the idea of the primary consumer being higher in the food chain.

(b) (ii) Describe and explain the changes in biomass shown in Fig. 3.
[6]
Indicative content: The trophic pyramid shows the reduction of biomass with increased trophic levels. Exponential decrease. Reasons for this are the loss of energy due to respiration, decomposition, excreta, feeding and or death of species. This will account for the shape and the biomass figures. There should be some development of the way in which biomass is decreased.

Level two (5-6 marks): candidates describe and explain the shape of the trophic pyramid and use the figures that are given.

Level one (0-4 marks): candidates describe the shape of the trophic pyramid with little, if any, attempt at explanation of the shape and/or figures. At the top of this level there is better use of geographical terminology, reference to the rate of change, use of figures.

The following is for guidance:

The trend is identified but there is no explanation or development = 0-2 marks.
The trend is identified with some supporting evidence = 3-4 marks.
No trend is identified = max of 2 marks.

c)   With reference to <u>one</u> or more ecosystems, describe and explain how human activity might alter the flows of energy and nutrients.   [10]

Indicative content: answers might include deforestation whereby energy converters are removed from the ecosystem. This will also affect the nutrient cycle in that there is less organic matter to be recycled and so less humus and nutrients are added to the soil. Deforestation may also affect the hydrology of an area. A marine ecosystem can be accepted, as can tropical rainforests.

Level three (8-10 marks): candidates describe, explain and relate the human activity to energy and/or nutrient flows in a named ecosystem. Confident use of geographical language. One activity can get full marks.

Level two (5-7 marks): candidates describe human activity and explain or refer to the alteration of energy or nutrient flows. More accurate use of geographical language.

Level one (0-4 marks): candidates describe human activity with no explanation. Limited or no reference to place. Bottom of the level might be a list.

Atmospheric Systems

3   Study Fig. 4 (insert), which shows the distribution of temperature across a large city at 6am in May.

(a) (i)   Describe the temperature pattern shown.   [4]

Indicative content: general increase of temperature towards point A with lower temperatures towards the edge of the city. The presence of water leads to cooling of the temperature. There is a steep change towards the edge of the city (e.g. 3°C over 2.5 kms at point B). Greater cooling in the east where the river leaves the city.

Level two (3-4 marks): candidates make specific, detailed reference to the map. The different rates of change or an anomaly will be identified at the top of this level. An anomaly might be used instead of figures at the bottom end of this level.

Level one (0-2 marks): candidates outline the basic pattern of temperature increasing towards the centre and it being lower at the edge of the city. There is no reference to the anomalies.

(ii) State and explain two possible reasons for the different temperature at A and B.   [6]

Indicative content: building densities: higher in the city centre at A with more heating, air conditioning heating the city air; greater trapping of the sunlight means greater heating. Higher emission of pollutants in the CBD increases the temperatures. More space and green areas leading to cooler temperatures at B. Lower building and population density leading to cooler temperatures. Where there is a river or water the temperatures are lower due to the cooling effect of the water.

Mark each reason separately as far as possible. Do not credit opposites.
1 mark for each reason stated.
2 marks for the quality of the explanation given.

(b) What is meant by the terms:

(i)   condensation?   [2]

This is the change of state from water vapour to a liquid (2).

(ii)   longwave radiation?   [2]

This is the outgoing radiation (1) that is emitted from the earth (1).

Reflected from the earth is not accepted.

(iii)   Describe and explain how condensation and longwave radiation give rise to a variety of weather phenomena at a local scale.   [10]

Indicative content: loss of heat and the cooling of air can give rise to frost, fog and dew. Most long wave radiation is lost overnight when conditions are calm and cloud cover minimal. Formation of frost requires loss of heat from the earth and temperatures to fall. Dew requires condensation to take place and condensation nuclei are required (e.g. grass). More common in spring and autumn due to the temperature change. Fog forms mostly in autumn and spring and is due to cooling of the air with a temperature inversion needed. This leads to dew point being reached and low level condensation. A temperature inversion may be associated with fog formation. Accept clouds and accept urban heat islands.

Level three (8-10 marks): candidates describe and explain the formation of more than one type of local scale weather phenomenon. Answers are clear and detailed with confident and accurate use of geographical language.

Level two (5-7 marks): candidates describe types of weather and attempt to explain the formation of at least one type of weather. There is more detail and geographical language is used with more confidence.

Level one (0-4 marks): candidates describe types of local weather. There is no explanation. Weak use of geographical terminology. Answers at the bottom of this level may be no more than a list.

Lithosphere

Study Fig. 5 (insert), which shows a limestone cliff and slope in Southern Spain that is experiencing mass movement.

(a) (i)   What is meant by the term mass movement?   **[2]**

The movement of slope material (1) due to gravity/downhill (1).

Slope material = (1)
Downhill or gravity = (1)

(ii)   Explain the mass movement processes contributing to the formation of the features labelled A (terracettes) and B (scree) in the photograph.   **[4]**

Indicative content: Terracettes have been formed by soil creep on the rectilinear slope. This is very slow, less than 1 cm per year. Movement of individual soil particles caused to move down hill by gravity. Triggers are lubrication, expansion and contraction (frost creep and thermal), burrowing by animals. Scree has been formed by freeze thaw in the joints of the limestone on the free face. Scree is also present which has formed due to rockfalls. The rocks are weakened by freeze thaw and then are loosened from the rock face. Gravity pulls them off the rock face. Other triggers could include extreme weather, pressure release (although not really in this photograph), or earthquakes.

Mark each process separately.

Level two (3-4 marks): a process of mass movement is identified and explanation is present.

Level one (0-2 marks): a process of mass movement has been identified but there is minimal or no explanation.

(b) **Describe and explain the factors that might control the rate of weathering process on the cliff face.** **[6]**

Indicative content: joints and bedding planes are present which present lines of weakness. These are exploited by weathering processes, which will increase the rate of weathering. The fact that soil has buried some of the limestone will protect it from rapid weathering. Temperature, aspect, amount of rainfall and acid rain are acceptable. Do not allow granite or other rock types.

Level two (5-6 marks): candidates describe and explain the controls on the rate of weathering. For the top of this level there must be reference to the rate of weathering. More than one factor described and explained is needed for this level. Accurate use of geographical terminology.

Level one (0-4 marks): the answer is mainly descriptive with an element of explanation present. One factor done very well with reference to the rate will reach the top of this level. Inaccurate use of geographical terminology.

(c) **Describe and explain how human activity might influence mass movement**
[10]

Indicative content: human activity might increase or decrease the rate of mass movement. Activities such as building, ploughing, management will affect the rate of mass movement. Afforestation might decrease the rate and amount of mass movement.

Level three (8-10 marks): candidates describe and explain and relate the human activities to mass movement processes. The impact is clear. The answer is clearly related to different human activities. Confident and accurate use of geographical terminology.

Level two (5-7 marks): candidates describe human activity and there is explanation present or the impact is referred to. The answer is more detailed with more accurate use of geographical language.

Level one (0-4 marks): candidates describe human activity. Answers at the bottom of this level may be no more than a list. Inaccurate use of geographical terminology.

Mark Scheme 2681
January 2005

1   **Population**

Study Figs 1 and 2 (insert) which show birth rates and death rates for India and Australia, between 1900 and 2000.

(a) What is meant by the term 'natural increase'?   **[2]**

The increase in population as a result of birth rate exceeding death rate.
1 mark only for 'birth rate minus death rate'.

(b) (i)   With reference to Fig 1 and Fig 2, compare the natural increase of India with that of Australia between 1900 and 2000.   **[4]**

Level 2   3 – 4 marks
A clear description that compares the differences in the natural increase of the two countries between the two dates. The discriminator from Level 1 is that a summative comment is made. Responses which describe changes in the relationships between birth and death rates without use of the term 'natural increase' may also be awarded up to 4 marks. Max 3 marks if no reference to figures or dates.

Level 1   0 – 2 marks
A basic description that may not focus on differences in natural increase throughout the time period. There may be separate, descriptions of changes in birth and / or death rates without reference to natural increase.

Indicative content.

- Natural increase was higher in Australia between 1900 and approx 1930 whereas it was higher in India between 1930 and 2000.
- Australia's n.i. has declined overall whereas India's has increased / remains high
- Australia's n.i. has fluctuated throughout / India's n.i. has declined in only one period
- In 1900 the n.i. of Australia (13 / 1000) was approx twice that of India (6 / 1000) whereas in 2000 India's n.i.(18 / 1000) was at least twice that of Australia (7 / 1000).

(b) (ii)   **State and explain possible reasons for India's declining birth rate between 1900 and 2000.**   **[6]**

Level 2   **5 – 6 marks**

A clear understanding with at least two valid reasons linked to the decline in birth rate.

Level 1   **0 – 4 marks**

A basic understanding. Up to 4 marks may be awarded for one valid reason with appropriate explanation.
At the lower end of the mark range (max 2) there will be little more than simple statement of one valid factor or a purely descriptive response.

Indicative content.

Possible reasons may be political, economic, social or demographic, including:-
- Decreasing rates of infant mortality – nutrition – post natal care
- Government birth control policies – contraception/incentives – sterilisation
- Government policy – education – awareness of problems created by uncontrolled growth / overpopulation
- Improving levels of female literacy
- Later age of marriage
- Rising levels of income – improving standards of living
- Decline in the proportion of population in the reproductive age range

(c)   **Trends in birth rates and death rates shown in Fig 1 and Fig 2 can lead to changes in a country's age structure.**
State and explain <u>one</u> possible difference between the age structures of India and Australia in 2000.   **[3]**

1 mark for clear identification of any one valid difference in age structure and up to two marks for explanation of the difference.

Indicative content.
Possible differences include :-

Overall
- Tapering of the Indian pyramid whereas the Australian pyramid has a more variable decrease – higher birth rates in India plus higher infant mortality and continued higher mortality rates with increasing age

Specific age categories
- Indian pyramid has higher % of young / under 16 – higher birth rate, high infant mortality, children an economic asset, low life expectancy
- Australian pyramid has higher % of elderly / over 60 or Australia has higher % of working population 16 –60, longer life expectancy, better health care, nutrition etc, lower death rates in all age groups, low birth rate

(d) (i)   **What is meant by the term net migration gain?**   **[2]**

Net migration gain is the growth in population as a result of more people moving into an area than moving out (permanently) i.e. immigration exceeding emigration in an area over a time period.
1 mark for responses which show less secure understanding of net gain i.e. defining only part of the term e.g. ...when people migrate into an area...

(ii)   **With reference to examples, describe and explain two ways in which age – sex structure may be influenced by net migration gain.**   **[4 + 4]**

Each way to be marked separately but using the same levels mark scheme.

Level 2   **3 – 4 marks**
A clear response in which an effect on age – sex structure is explicitly linked to the influence of net migration gain on the receiving area. Exemplification is required for full marks. Max 3 marks if no appropriate exemplification.

Level 1   **0 – 2 marks**
A basic response in which there is no link between the effect on age – sex structure and net migration gain. Responses are descriptive only.

Indicative content.

Possible effects include :-
- Increased proportion of young working population and / or children arising from economic / social / political influences such as the effects of counterurbanisation / relocation e.g. dormitory settlements / new towns
- Increased proportion of elderly and / or elderly females arising from retirement migration
- Increased proportion of young males / females (depending on cultural / economic circumstances) e.g. in LEDC urban areas

In addition to examples of internal migration, also credit examples of international migration where significant effects on the age – sex structure of an area can be demonstrated.

                                                   [Total: 25]

2   Rural Settlement

Plymouth is a large urban area in Devon with a population of approximately 240,000.
Study the 1:50000 OS map extract of part of the rural hinterland of Plymouth, Devon and Fig 3 (below) which shows population change in the parishes of Buckland Monachorum and Sheepstor.

(a)   What is meant by the term counterurbanisation?   **[2]**

A decrease in the proportion of people living in urban areas.
An increase in the proportion of people living in rural areas.
The net effect of decentralisation of population from urban areas to rural areas.

1 mark only for a less precise definition e.g. a decline in population of large urban areas or a growth in rural population i.e. just one part of the process.

(b)   (i)   With reference to Fig 3, compare the changes in population of Buckland Monachorum and Sheepstor between 1961 and 2001.   **[4]**

Level 2   3 – 4 marks
A clear description which compares the changes in population between 1961 and 2001.
The discriminator from Level 1 is reference to both parishes.
Max 3 marks if no reference both to significant change in Buckland Monachorum (e.g. rate of change) and also to dates or population figures for each parish.

Level 1   0 – 2 marks
A basic description that might refer only to Buckland Monachorum or only to Sheepstor i.e. comparison is not made. There might be reference to absolute numbers only date by date.

Indicative content.

- Buckland Monachorum experienced rapid growth in the 1960s, slower growth   between 1971 and 1991 and slight decline in the 1990s
- Sheepstor's population has remained relatively constant throughout with only minor fluctuations.

(ii) **Using OS map evidence only, state and explain possible reasons for the differences in population change for Buckland Monachorum and Sheepstor between 1961 and 2001.** **[6]**

Level 2 **5 – 6 marks**
A clear explanation which shows understanding of at least two reasons for the contrasts in population change. Max 5 marks if no specific reference to the OS map.

Level 1 **0 – 4 marks**
A basic explanation offering only undeveloped reasons.
One well developed reason for contrasts in population change may be awarded up to 4 marks. Max 3 marks if no reference to the OS map.
At the lower end of this mark range up to 2 marks may be awarded for simple descriptive statements, or map evidence alone, with no explanation

Indicative content.

Possible reasons include :-
- Commuting - in Buckland Monachorum there is relatively easy access to the A386 whereas Sheepstor is connected only by very minor roads – affects travelling time to Plymouth
- Access to higher order services - shorter distance to Plymouth for residents of Buckland Monachorum
- Planning restrictions / availability of housing stock - parish of Buckland Monachorum is mainly outside the national park with clear evidence of housing stock beyond the boundary whereas Sheepstor lies wholly within the national park
- Access to local services / service centres - fewer services in Sheepstor and poorer access to local central places (such as Horrabridge, Yelverton) for residents of Sheepstor.
- Higher altitude in Sheepstor – harsher environment, limited resources for farming may have led to the slight loss in population

(c) Key settlements have been selected for planned growth in some counties.

With specific reference to the OS map, state <u>one</u> possible reason why Horrabridge (5169) was selected to be a key settlement. **[2]**

1 mark for a clearly stated valid reason and 1 mark for supporting map evidence.

Possible answers include:
- To lessen the effect of rural service decline – Horrabridge (some 10km from the outskirts of Plymouth) is a relatively large settlement which suggests a concentration of population allowing service thresholds to be met.
- Accessible – convergence of routes; Horrabridge is a service centre for a number of surrounding smaller settlements (including those located in the national park where the need to preserve their original character may have restricted service provision)
- Infrastructure already present – physical size suggests relatively large population with services already in place – reduces costs of further development

(d) With reference to a named rural area in an MEDC, describe and explain the socio-economic changes in settlements both close to, and remote from, a large urban centre during the last 40 years.   [10]

Level 3   8 – 10 marks

A Level 3 response should include detailed knowledge and convincing understanding of social and / or economic change in a rural area in an MEDC. A discriminator from Level 2 might be explanation of social and / or economic change both in an area close to and also in an area remote from an urban centre. Reference to place names is expected at this level. In addition reference to specific socio-economic elements such as shops, services, % of second homes, % unemployment, population figures etc are required for full marks.

Level 2   5 – 7 marks

Clear knowledge and understanding of social and / or economic change in a rural area. There may be explanation of social and / or economic change in only one type of area, either close to, or remote from an urban centre. Knowledge of place detail and / or specific socio-economic elements is less secure.

Level 1   0 – 4 marks

Basic knowledge and understanding of social and / or economic change in a rural area. Factual information is limited. No explanation is offered with description only of one or both types of area.

Wholly generalised answers may be awarded up to 6 marks.

Indicative content.

Possible changes could include :
• Population – total and / or structure
• Services
• Housing – changes in housing stock and / or tenure (second home and holiday home ownership)
• Retail establishments – number and / or type

[Total: 24]

3   Urban Settlement

(a) **Study Figs 4 and 5, photographs of two areas in Bridgetown. Bridgetown is the capital city of Barbados, West Indies with about 110,000 inhabitants.**

Compare the characteristics of the urban land use shown in Figs 4 and 5.   [4]

Level 2   3 – 4 marks
A clear description of land use in the two urban areas that makes explicit comparison.
Any two comparative points for full marks**.**

Level 1   0 – 2 marks
A more basic description that makes only one directly comparative point or perhaps offers a description of only one locations.

Indicative content.

Possible points in Figs 4 / 5 include :-
- high density building with no open space / lower density with gardens
- mainly commercial use / mainly residential use
- several storeys / single storey
- concrete, brick construction, modern facades / wooden construction, some upgrading

If there is clear statement of photographic evidence, other contrasts may be credited such as age of buildings, quality of residential accommodation, road maintenance / management.

(b) **Explain the locations of low quality housing found in large urban areas in LEDCs.   [6]**

Level 2   5 – 6 marks
A clear account of at least two reasons linked to a valid location(s). There must be appropriate development of each reason for 6 marks. Exemplification is not essential but it may be credited if it helps to confirm understanding.

Level 1   0 – 4 marks
An account which includes only one developed explanation, linked to a valid location may be awarded up to 4 marks.
At the lower end of the mark range (max 2 marks) responses may include only basic statements or they are merely descriptive.

Indicative content.

Possible reasons include :-
- space available for building on the edge of the city – squatter settlements represent recent growth and are found therefore beyond the older built up area
- alongside sites with strong negative externalities which tend to be around the edge of cities – rubbish tips (recycling), sewage works, ring roads, airports, industry
- access to employment - on land adjoining industry which tends to be peripheral
- on land furthest away from the attention of the authorities – less likelihood of eviction
- alongside arterial roads with access to central areas and possible employment opportunities
- potentially hazardous sites e.g. flood plains, steep slopes

(c) Explain the location of high quality residential areas in large urban areas in LEDCs. [6]

Level 2   5 – 6 marks
A clear account of at least two well developed explanations linked to a valid location(s) may be awarded up to 6 marks. Responses which include three or more valid reasons with some development but slightly less detail may also achieve full marks.

Level 1   0 – 4 marks
A basic account which includes only one developed explanation linked to a valid location may be awarded up to 4 marks.
At the lower end of the mark range (max 2 marks) responses offer brief statements which include little more than a description of the location(s) of high status housing areas.

Indicative content.

Possible reasons include :-
- poor urban transport systems / traffic congestion – wealthy can afford to live in close proximity to work in office blocks which are concentrated in the CBD / commercial spine
- central locations also favoured since wealthy groups can afford high quality housing (often high rise apartments) in close proximity to best shops, theatres, restaurants, museums etc
- wealthy can afford to live in more expensive housing near parks / open areas with more desirable environmental qualities (or universities and schools) / avoiding industrial, polluted areas - with easy access to the centre
- close proximity to concentration of political institutions near centre such as government offices and embassies – employment and services

- central location attracts groups of higher socio-economic status since they prefer the larger, low density housing which is a legacy of colonial periods – now surrounded by extensive suburbs of lower grade housing
- wealthy attracted to districts where infrastructure for services is developed (e.g. areas of safe water supply, sanitation and efficient waste collection)
- away from the centre, housing in former villages (now engulfed by urban sprawl) which have easy access to the centre have become attractive and gentrified by wealthy groups – high degree of car ownership
- some areas of decentralised commercial centres / shopping malls attract the wealthy
- various instances of high security, gated enclaves where property protected in distinctly segregated environments

(d) **Describe and explain how recent demographic trends have caused environmental change in a named LEDC urban settlement in the last 40 years.**

                                                                                                [10]

Level 3   8 – 10 marks
A response in which there is detailed knowledge of environmental change in an LEDC urban area. The discriminator from Level 2 is that the response should include well developed understanding of the link between demographic change and two effects on the environment. Specific reference to population figures or named intra-urban areas / features is required for full marks.

Level 2   5 – 7 marks
A clear understanding of the link between demographic change and one environmental change is required at this level. Knowledge of population figures and place specificity will be less secure.
The discriminator from Level 1 is reference to the link between demographic change and environmental change.

Level 1   0 – 4 marks
A basic response in which there is little more than description of demographic change or description of environmental change; there is no understanding of the link between the two. Place specificity is weak.

Wholly generalised responses may be awarded up to 6 marks**.**

Indicative content.

Environmental change could include reference to deterioration such as :-

- loss of water supply
- contamination of water supply
- untreated sewage
- untreated solid waste
- air pollution
- impacts on natural ecosystems e.g. lakes, forests
- squatter settlements

and / or examples of enhancement.

                                                                                                [Total: 26]

Mark Scheme 2682
January 2005

1   State the title of your Geographical Investigation below:

(a) Draw one clearly labelled diagram in each of the boxes A and B below, to show two different ways in which you presented data in your Geographical Investigation.   [5+5 marks]

5 marks for each diagram. **Each diagram must be located in a box.**

Indicative content:
The following diagrams are acceptable:
   ◆ *Figure (chart)*: title, labelled axes, labelled points and/or lines/bars where appropriate.
   ◆ *Figure (other, e.g. pie chart):* title, labelled components.
   ◆ *Table:* title, labelled rows and columns.
   ◆ *Map based (flow lines, isolines, dot maps, choropleths):* title, scale, north, key, labelled components
   ◆ *Photograph:* title, annotations. [NB: a photograph will be hard to represent].
   ◆ *Map/Sketch:* title, scale, north, key, [NB: a map alone will not be easy to represent].
   ◆ *Figure located on map*: see characteristics of figures and maps.
   ◆ *Models (e.g. Burgess)*: application of investigation data to model.

The following content is applied to each level:
   ◆   The relevance of the diagram to the Geographical Investigation.
   ◆   The technical correctness of the diagram chosen.
   ◆   The clarity of the diagram.

Level 2 (3-5 marks)
Top: relevant; clear; technically correct.
Middle: relevant; clear; most technical features present and/or correct.
Bottom: relevant; clear; some technical features present and/or correct

Level 1 (0-2 marks)
Top: relevant; not clear; few technical features present and/or correct
            not relevant; not clear; not all technical features present and/or correct.
Bottom: not relevant; not clear; few technical features present and/or correct.

If the title of the Geographical Investigation is not given after "State the title of your Geographical Investigation below", Max top Level 1.

(b) For each of the diagrams explain why you chose this way of presenting the data.
[5+5 marks]

5 marks for each explanation, **which must apply to the correct diagram**.

Indicative content:
  ◆ *Figure (chart):* show relationships between 2 or more variables; show proportions; visually attractive; bars used combinations of qualitative and quantitative variables; lines used for quantitative variables; scatter used when data available for many locations, show anomalies.
  ◆ *Figure (other, e.g. pie chart):* visually attractive; show proportion of components; show scale.
  ◆ *Table:* exact data values; data ready for statistical analysis.
  ◆ *Map based (flow lines, isolines, dot maps, choropleths):* visually attractive, location shown, provide context, show scale, show proportions/densities.
  ◆ *Photograph:* visually attractive; highlight key characteristics/relationships.
  ◆ *Map/sketch:* location shown; scale of site for data collection shown; provide context.
  ◆ *Figure located on map*: see characteristics of figures and maps.
  ◆ *Models*: able to represent results of study findings in terms of model.
  ◆ *Credit the rejection of alternative diagrams*.

The following content is applied to each level:
  ◆ **The level of detail.**
  ◆ **The use of geographical terminology.**
  ◆ **The clarity of the explanation.**

Level 2 (3-5 marks)
Top: Detailed explanation of why the diagram was chosen.
Bottom: General explanation of why the diagram was chosen.

Level 1 (0-2 marks)
Top: Limited explanation of why the diagram was chosen.
Bottom: Diagram described, but no explanation.

Max top Level 1 if do not correctly identify the type of diagram/method of data presentation in either (a) or (b).

2 **Figures 1 and 2 provide examples of two different locations where you might carry out a Geographical Investigation.**

(a) For each of these two locations, suggest an appropriate question for a Geographical Investigation. **[5+5 marks]**

5 marks for each suggested title (Location A: sand dunes. Location B: deciduous woodland). ***No marks given if the title does not clearly relate to the correct location.***

Level 2 (3-5 marks)
Top: The question is suitable for a real and successful Geographical Investigation.
E.g. "What is the relationship between vegetation height and coverage with changes in height and distance along a sand dune transect?" This is at the right scale, data will be available and it is researchable at AS level.

Bottom: Some adjustment would be needed for the question to be successful.
It must be realistically researchable, but may be overambitious and lack specificity.
E.g. "What is the relationship between vegetation height and coverage along sand dunes?" The question is valid, but lacks specificity.

Level 1 (0-2 marks)
Top: The question is not suitable without substantial modification, i.e. it is not realistically researchable.
It will lack specificity and clarity.
E.g. "Does this woodland ecosystem fit the textbook model?" This is a valid question but the scale is too vague.

Bottom: The response given does not constitute a valid investigation.
E.g. "How many plants are there in a given space?" The scale is far too large and the question too vague for a 1000 word investigation.

Accept either a question or a hypothesis for investigation.

(b) For one of the locations you have selected, justify the question you have identified. You must identify clearly which location your justification refers to.
[10 marks]

No marks given if it is not clear which location is being referred to.

Indicative content:
   ⬩ Explanation of geographical theory in relation to study area.
   ⬩ Scale of the Investigation.
   ⬩ Number and location of transects.
   ⬩ Variables selected.
   ⬩ Accessibility to site.
   ⬩ Accessibility to data collection equipment.
   ⬩ Ability to collect data during 1 visit (or more if part of question).

The following content is applied to each level:
   ⬩ **The level of detail.**
   ⬩ **The use of geographical terminology.**
   ⬩ **The clarity of the explanation.**

Level 3 (8-10 marks)
Top: **Two or more** points of justification are discussed **well.**
Bottom: **More** points of justification are discussed **in less depth**.

Level 2 (5-7 marks)
Top: **Two or more** points of justification are discussed **moderately well.**
Bottom: **More** points of justification are discussed **in less depth**.

Level 1 (0-4 marks)
Top: **One or more** points of justification are discussed **in a basic manner.**
Bottom: The comments made are **descriptive/irrelevant** rather than giving justification.

3   **The data shown in Fig. 3 (below) was collected in an investigation of pedestrian flows each hour over a 24 hour period in a shopping street in a medium sized town.**

     (a) The mean value of the pedestrian count is 80. What are the strengths and weaknesses of the mean as a statistic describing this data?   **[10 marks]**

Indicative content:
- Strengths of mean:
  - Ease of calculation.
  - Ease of understanding/communication.
  - Appropriate because it gives one summative value from many individual values.
  - Appropriate for this example because the extremes are not too great.
  - Appropriate to this data because symmetrical distribution of data.
  - Appropriate because the calculated value is meaningful.
  - Appropriate because the data set is not small.
  - Can be used for further calculation, e.g. standard deviation.
- Weaknesses of mean:
  - It is affected by the extreme values, but cannot show the extreme values.
  - Needs standard deviation to be calculated in order to show variation from mean.
  - Does not show distribution, e.g. changes during course of the day.
  - Takes longer to calculate than mode/median.

Possible indicative content:
- Strengths of mode/median:
  - Mode/median very quick to calculate.
  - Mode/median not affected by extreme values.
- Weaknesses of mode/median:
  - Mode involves a considerable loss of information.
  - Mode/median cannot be used for further mathematical processing.
  - Median does not reflect the significance of the extremities of the distribution.
  - Median gives equal weight to each item regardless of its value.

> The following content is applied to each level:
> - **The level of detail.**
> - **The use of geographical terminology.**
> - **The clarity of the explanation.**

Level 3 (8-10 marks)
Top: **Two or more** points are discussed **well.**
Bottom: **More** points are discussed **in less depth**.
Must include one or more strengths and one or more weaknesses.
Must refer to the raw data set.

Level 2 (5-7 marks)
Top: **Two or more** points are discussed **moderately well.**
Bottom: **More** points are discussed **in less depth**.

Level 1 (0-4 marks)
Top: **One or more** points are discussed **in a basic manner.**
Bottom: The comments made are **irrelevant**.

(b) **Figure 4 (below) shows the temperatures recorded at a meteorological station (A) in a city and at a station (B) in the city's rural surroundings at 0600 hrs on nine occasions.**

How would you use the Mann-Whitney U test to help you decide if temperatures are higher in the city? **[10 marks]**

Indicative content:
- Concept of difference: Mann-Whitney can be used as
  - Null hypothesis states that the 2 data sets (city and rural) are drawn from the same population or two identical populations.
  - It tests the difference in temperature between 2 data sets.
  - There are 2 independent data sets at an ordinal scale.
  - All recordings made at the same time of day.
- Carrying out the test:
  - The 2 data sets (number of readings for A and B: $n_1 = 9$, $n_2 = 9$) are ranked continuously together.
  - Ranks of A added together (ΣR_1).
  - Ranks of B added together (ΣR_2).
  - Calculate:
    $U_1 = n_1 n_2 + \{[n_1(n_1 + 1)]/2\} - \Sigma R_1$ *and* $U_2 = n_1 n_2 + \{[n_2(n_2 + 1)]/2\} - \Sigma R_2$

  - Smallest of U_1 and U_2 is read off against critical value on critical values table.
- Meaning of the outcome and its significance:
  - If smallest U number is less than critical value, reject the null hypothesis, i.e. there is a significant difference in temperature between the city and rural area at the selected level (usually 95%).

The following content is applied to each level:
- **The level of detail.**
- **The use of geographical terminology.**
- **The clarity of the explanation.**

Level 3 (8-10 marks)
Top: Concept of difference, how to carry out test, meaning of outcome and its significance level are discussed **well**.
Bottom: Concept of difference, how to carry out test, meaning of outcome and its significance level are discussed **less well.**
Must discuss the data set.

Level 2 (5-7 marks)
Top: 2 or more of concept of difference, how to carry out test and meaning of outcome and its significance level are discussed **moderately well**.
Bottom: 2 or more of concept of difference, how to carry out test and meaning of outcome and its significance level are discussed **less well**.

Level 1 (0-4 marks)
Top: 1 or more of concept of difference, how to carry out test and meaning of outcome and its significance level are discussed **in a basic manner**.
Bottom: **Little or no** reference to any of concept of difference, how to carry out test and meaning of outcome and its significance level

1. **Spearman's Rank Correlation: no credit as it does not test differences.**
2. **Chi^2: credit those parts of the response relating to the concept of difference and the meaning of the outcome and its significance.**

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January 2005

Generic Mark Scheme

AO1 Knowledge (0-11 marks)

Section A		Section B
6-7	**Level 3** Substantial knowledge of themes, processes, concepts, environments, and where appropriate specific examples.	4
4-5	**Level 2** Sound knowledge of themes, processes, concepts, environments, and where appropriate specific examples.	2-3
0-3	**Level 1** Basic knowledge of themes, processes, concepts, environments and examples.	0-1

A02 Critical Understanding of Content (0-10 marks)

Section A		Section B
4	**Level 3** Authoritative understanding of concepts, theories and content including examples where appropriate.	5-6
2-3	**Level 2** Sound understanding of concepts, theories and content including examples where appropriate.	3-4
0-1	**Level 1** Basic understanding of concepts, theories and content and examples where appropriate.	0-2

AO3 Application of knowledge and critical understanding to unfamiliar contexts (0-12 marks)

Section A		Section B
3	**Level 3** Clear application of relevant knowledge and understanding to the question set.	8-9
2	**Level 2** Sound application of relevant knowledge and understanding to the question set.	5-7
0-1	**Level 1** Limited application of relevant knowledge and understanding to the question set.	0-4

AO4 Skills and techniques including communication skills (0-12 marks)

Section A		Section B
5-6	**Level 3** Clear structure and organisation. Communication is clear with maps, diagrams, statistics, if appropriate. Confident use of geographical terms.	5-6
3-4	**Level 2** Sound structure and organisation. Communication is sound with maps, diagrams, statistics, if appropriate. Some accurate use of geographical terms.	3-4
0-2	**Level 1** Poor structure and organisation. Much inaccuracy in communication and limited and/or ineffective use of different forms. Little confidence in the use of geographical terms.	0-2

Section A

List A Options

Option 1: Coastal Environments

1 (a) **What are the causes of changing sea level?** **[20]**

   (b) **Explain how both rising and falling sea levels influence the development of coastal landforms.** **[25]**

   (a) The focus here is on eustatic and isostatic changes. A response containing a clear understanding of relative or net change should be awarded in AO2 at Level 3. Points include;
   - both terms refer to long-term and significant sea level changes
   - eustatic refers to absolute changes in global sea level
   - isostatic refers to the vertical movement of land
   - eustatic mainly results from glacio-eustacy that is the transfer of water within the hydrological cycle. During a period of glaciation water is locked up as ice on the land, thereby lowering sea levels. Some 18 000 BP sea levels were approx. 130 metres lower than today.
   - As deglaciation occurs ice melts so that water is free to continue through the hydrological cycle and return to the sea, which therefore rises in level. Some 10 000 BP sea level had risen to approx. 35 metres below today. Approx. 6 000 BP this relatively rapid rise in sea level had taken sea level to about 10 metres below today. Since then there has been a relatively slow rise in sea level to its present position, although there were higher sea levels during some inter-glacials.
   - isostatic mainly results from glacio-isostacy. Continental ice sheets exert great overburden pressure causing the land to subside. When these sheets melt, the land is released from this downward pressure and so 'rebounds' or undergoes uplift.
   - glaciated areas such as western Europe have complicated relative sea level histories as when ice sheets melt both sea and land rise.
   - tectonics can also lead to relative upward of downward movement of the land. This is commonly seen at a local scale such as the localised Tertiary movements evident in N. Wales e.g. Lleyn peninsula, although the regional tilt of the British Isles should be widely known by the candidates.
   - eustacy associated with the thermal expansion of water and melting of ice as consequences of global warming / thermal contraction during glacials
   - isostatic changes due to denudation/deposition balance e.g. S America.

   (b) The key assessment here is the level of application of the processes to landform development. A0s 1 + 2 will reward the coastal landforms, A03 the link between landform and sea level change and A04 has potential to reward diagrams and sketch maps as well as text. The question mentions both rising and falling sea level so a determined effort to comply should lift the A03 mark to Level 3. Points include;
   - Eustatic changes;
   - shingle beaches (spits; bars; tombolos) that have been driven onshore by rising sea levels post-glacially.
   - drowned valleys. Fjords and rias.
   - fossil shore platforms, beaches and cliff lines resulting from falling sea level
   - slope over wall cliffs
   - Isostatic changes;
   - fossil shore platforms, beaches and cliff lines resulting from rising land level

2 (a) Describe how human activities can impact on coastal sand dune and salt marsh systems. [20]

(b) Explain the role of vegetation in the formation of coastal sand dunes and salt marshes. [25]

(a) Impacts of human activities are explicitly stated in the Spec. as are sand dune and salt marsh systems. An even treatment of the two ecosystems is not necessary for top Level marks but a response that only includes one should not receive more than Level 1 in AO3. A response offering positive as well as negative impacts is likely to receive a Level 3 mark in AO2. Clear descriptions that are likely to include convincing exemplification should reach Level 3 in AO1. We must be open to candidates describing a wide diversity of impacts and there might be references to field courses that can be rewarded. Points include;
  * recreational impacts – blow-outs in sand-dunes
  * conservation – management of both ecosystems
  * flooding – abandonment of coastal defence in some salt marsh locations
  * reclamation – draining of salt marsh for agriculture/manufacturing; levelling of sand dunes for building (housing/manufacturing)
  * pollution – oil spills on salt marsh

(b) As with (a) there need not be an even coverage of the two eco-systems for top Level marks but a response that only includes one should not receive more than Level 1 in AO3. The question asks specifically about the role of vegetation, therefore responses that make a convincing link between plants and dunes and marshes should receive Level 3 in AO3. The correct identification of some of the key species (e.g. marram grass – Ammophila arenaria or cord grass – Spartina) might be an indication of Level 3 in AO1. There is much potential for AO4 marks to be gained by the use of diagrams. Points include;
  * vegetation has a stabilising effect, either reducing wind or water velocity, allowing particles to accumulate
  * tolerance of some species to various harsh conditions e.g. mobile sand, high salt levels, difficulty in obtaining fresh water
  * vegetation succession – a key understanding and without this Level 3 in AO2 can not be awarded
  * interaction between vegetation, hydrology and soil characteristics

3   (a)   How does the sea erode the land?   **[20]**

**(b)   Explain how the development of cliffs and shore platforms are influenced by both
        lithology and sub-aerial processes.**   **[25]**

(a) There should be clear and detailed descriptions of the main erosional processes. Material on
       beach erosion is as valid as those on cliffs. Comments about sub-aerial processes are only
       relevant if included as preparation for marine erosion e.g. salt crystallisation opening up
       fissures subsequently exploited by hydraulic action. The quality of description will be
       reflected in AOs 1 + 2 and Level 3 can be reached by good descriptions of all four of the
       principal processes.
  • abrasion/corrasion – sediment picked up by the sea and used in an abrasive way to
    remove yet more material
  • hydraulic action – waves breaking on well-bedded, jointed or faulted rocks creating
    hydraulic pressure in these structural voids which may lead to weakening and eventual
    removal
  • corrosion/solution – chemical decomposition of rock due to acidity of water
  • attrition – detached sediment rubbing against other sediment reducing sediment size and
    rounding the individual particles
  • mention of tidal range and wave type environment is likely to indicate a Level 3 response

(b) Cliffs and shore platforms are explicitly stated in the Spec and the two factors in the
       question, lithology and sub-aerial processes should be well-known to candidates. A balance
       between cliffs and shore platforms is likely to indicate a Level 3 response in AO3 but top of
       Level 2/ bottom Level 3 can be reached with a pre-dominance for cliffs for example. If just
       either cliffs or shore platforms are covered then bottom of Level 2 in AO3 is the upper limit.
       AO3 will assess the degree to which a response links lithology and sub-aerial together, so
       that without the link then bottom of Level 2 in AO3 should be the maximum award. It is likely
       that material on cliffs will make up the clear majority of responses and this will allow Level 3
       in AOs 1 + 2 to be reached. Annotated diagrams could well feature here and help advise
       AO4 marks. Points include;
  • the relative hardness of the rock as this influences the angle of the cliff that can be
    supported
  • the incline of the bedding planes – seaward dipping; landward dipping; horizontal; vertical
    influence both cliffs and shore platforms
  • weathering processes and their interaction with various lithologies e.g. granite;
    limestones; clays
  • cliff retreat can continue through pressure-release jointing.
  • wetting and drying of shore platforms

Option 2: Fluvial Environments

4   (a) Describe the characteristics of riffle and pool sequences.   [20]

(b) Explain how riffle and pool sequences form and how they can lead to meander development.   [25]

(a) There should be a clear description of the sequence with opportunities for AO4 marks via diagrammatic communication. Plan or long profile diagrams would be appropriate. Points include;
  *   alternating sequence, not just one pool and one riffle
  *   found along sinuous and straight stretches
  *   contrasting bed material i.e. gravel/small pebbles in riffle, finer material in pools. Without this Level 1 in AO1.
  *   low flow – current faster over riffles c.f. high flow – current faster through pools.

(b) The link between riffle and pool sequences and meander development will be important in advising AO3 marks, with the link Level 3 might be expected. Responses that focus entirely on meanders should receive bottom of Level 2 in AO3 but where there is a real effort to deal with all the elements then Level 3 should be given. There are also opportunities for AO4 marks via diagrams. Points include;
  *   riffles and pools develop at high flow
  *   turbulence set up due to frictional resistance between water and the bed and banks
  *   sinuous path set up even in straight channels
  *   spacing of eddies is c.5/6 times channel width
  *   downstream changes in fast and slow flow leads to erosion (faster flow) and deposition (slower flow)
  *   along sinuous stretches the path of the thalweg and the concentration of the faster flow on the outside of the meander help explain the pattern. Within a meander this higher energy flow undercuts the river bank.
  *   even in less sinuous stretches, thalweg wanders across the channel and varies in its concentration
  *   secondary flow, helicoidal, transfers sediment from deepened pool to shallower sections helping maintain pool riffle forms and promoting the establishment of point bar deposits on the inside of meanders

5 (a) How do rivers erode? **[20]**

(b) Explain how the processes of erosion, transport and deposition are influenced by a river's velocity. **[25]**

(a) There should be clear descriptions of the main erosional processes, abrasion/corrasion hydraulic action, corrosion/solution and attrition. The more convincing responses might also include comments about the type of water flow (laminar/turbulent) which could lift the mark in AOs 1,2 and 3. A thorough treatment of processes alone is capable of taking the response to the top Level. The quality of description will be reflected in AOs 1 + 2. Points include;
- corrasion / abrasion
- hydraulic action including cavitation – more effective when the river is flowing through a clay geology for example. Acceleration of flow causes a drop in pressure which, if of sufficient magnitude, leads to formation of air bubbles. As these bubbles implode, tiny jets of high velocity water are emitted.
- attrition – a response that distinguishes this from channel erosion might be a top Level differentiator in AO1
- solution – the more convincing responses will make this point in connection with carbonate geology over which the river is flowing
- vertical / lateral / headward erosion – these inclusion of these might be an indication of a Level 3 response in AOs 1, 2 +3

(b) This focuses on the critical forces required for the processes to occur. The Hjulstrom curve is specifically mentioned in the Specification and should be present in Levels 2 + 3 responses. It would be encouraging to read answers that explicitly linked an increase in velocity with an increase in the critical tractive force and so larger particles might be entrained; these are likely to be rewarded at Level 2 and above in A02. A clear knowledge and understanding of the principles that underpin the Hjulstrom curve may reach Level 3 in all four AOs. There are several technical terms that apply here and their correct application might help when assessing under A01, 2 and 4. Points include;
- competence of different flow velocities – competence is the max. particle size that can be entrained at a specific flow velocity.
- the need for higher velocities to entrain than to keep particles moving
- the need for the smaller particles(clay) to be subject to higher flow velocities than larger particles(sand) for entrainment
- narrow range of flow velocity between entrainment and fall for the larger particles and vice versa

6 (a) How might the efficiency of fluvial channels be measured?   **[20]**

(b) Explain the factors that influence channel cross-sectional shape.   **[25]**

(a) A key element here is that the candidate understands that only a small proportion of the total energy in a fluvial channel is available for the processes of erosion and transportation. The lower the proportion of total energy used in overcoming friction with the bed and banks and of the water itself the more efficient the channel. Responses may include comments regarding the practical measurement of factors influencing efficiency. Points include;
- hydraulic radius (cross-sectional area/wetted perimeter)
- width-depth ratios (width i.e. bank to bank/average depth)
- bed roughness – Manning's equation is explicitly mentioned in the Specification and its absence is likely to indicate a Level 1 response in AO1 and 3

(b) A river will try to adopt a channel shape that best fulfils its two main functions: transporting water and sediment. There is potential for good communication to be present via diagrams which can be rewarded under AO4. Responses that deal with valley shape are not valid. Points include;
- nature of bank materials – essential point for Level 3 in AOs 1, 2 +3 – coherent materials e.g. clay/silt channel tends to be deep and narrow; incoherent materials e.g. sand/gravel tends to be shallow and wide
- channel shape e.g. compact v wide + shallow is the key here
- differences between bankfull discharge and other discharges both higher (flood) and lower. Bankful discharge is the key determinant of shape. As bankfull discharge increases so do channel width and depth with width generally increasing more rapidly than depth
- calibre of load – decreases downstream and so there is less frictional resistance to flow so velocity increases helping explain the increases in width and depth
- vegetation along banks
- cross-sectional shape across a meander
- bars
- differences along a river's course would be appropriate here and might indicate a higher Level response

Option 3: Glacial and Periglacial Environments

7   (a) Describe how a glacier operates as a system.   [20]

**   (b) Explain how the advance and retreat of a valley glacier can lead to the formation of depositional landforms.   [25]**

(a) The glacier as a system is a major section within the Specification. At its most basic we are looking for a response to show knowledge and understanding of inputs, stores and processes and outputs for the AO 1, 2 + 3 marks. There is additional potential for AO4 marks from diagrams here. Points include;
- glacial mass balance – accumulation, ablation and the relationship between the two as regards mass balance
- stronger responses might make reference to non-ice components such as rock debris as an input and output
- contrast between cold and warm based glaciers

(b) The way a glacier functions as a system influences how a glacier moves and creates and modifies landforms. The Question is clear in its reference to valley glaciers and so reference to landforms not found in such landscapes will influence the mark in AO3 although it is possible for a wide range of landforms to be found in a valley. Deposition by ice and fluvio-glacial deposition can be accepted. The inclusion of both advance and retreat is intended as a guide to candidates but there need not be an even balance of material within a response. It is important that for the very highest marks, especially in AO3, candidates explicitly link movement with landform development rather than just offering a catalogue of glacial landforms. It might be a sign of a higher Level response when comments about subsequent advances and retreats modifying/destroying earlier landforms are included. Points include;
- till/boulder clay
- moraines – lateral/terminal/recessional/medial/push
- hummocky moraine
- drumlins
- kames and kame terraces
- varves in ribbon lakes – not strictly landforms but worthy of credit
- esker
- valley train

8   Study Fig. 1 which shows part of the Brecon Beacons in south-east Wales.

    (a) Identify the glacial landforms A, B and C, and describe their characteristics.   [20]

    (b) Explain how successive glaciations have modified the slopes shown in the photograph.   [25]

    (a) The aerial shot of the Brecon Beacons is a view of trough head / cirque development focussed along a plateau margin creating a deeply notched plateau edge (biscuit board topography). The aerial photograph shows at A a trough head / cirque, B a glacial trough and at C an arête or ridge at top of backwall. The descriptions of their characteristics might include diagrams, which can be assessed under AO4. Level 3 in AO3 should be reserved for those candidates who clearly attempt to deal with these particular landforms rather than a pre-learned example. Where a candidate incorrectly identifies a landform, credit can be given for the description of characteristics in AO1 + 2. The AO3 mark would reflect this mis-application to the actual question set.

    (b) The photograph is clear as regards the slopes on the landscape. There is a marked contrast between the steeper slopes making up the valley sides and the more rounded nature of the crests between valleys. This is a pattern found in other parts of the UK. Points include;
- The word 'successive' is likely to be picked up by the more thoughtful candidates who would relate the idea of glacials and inter-glacials to the coming and going of ice in the area. Any who make a convincing effort at this are likely to be at Level 3 in AO3
- excavation of the troughs by valley glaciers leading to a steepening of the sides
- trough head / cirque development steepening slopes
- over-riding of the area by ice sheets smoothing and rounding the upper slopes
- deposition of moraines steepening slopes locally within the trough
- a possible indication of a higher level response in AO3 might be reference to the modification of a pre-glacial fluvial landscape so that most slopes have been steepened.

9 **(a)** **Describe what is meant by peri-glaciation and describe the distribution of past and present day periglacial environments in Western Europe.** [20]

(b) **Explain the role of periglacial processes in the development of landforms in glaciated upland regions.** [25]

(a) Understanding of what constitutes periglacial will be rewarded in AO2 while the knowledge, including place, will be assessed under AO1. The term periglacial is somewhat imprecise and broad and we should not be rigid in our demands for exact definitions from the candidates. We can accept descriptions about areas that are characterised by intense frost-action and at least seasonally snow-free ground. As a general guide the upper limit for mean temperature lies between -1 to -3°C and with mean annual precipitation >1000 mm. Candidates who include this range of locations are likely to be higher Level candidates, for example in AOs 1 + 2. Although there is considerable overlap, peri-glacial is not synonymous with permafrost. Points include;
- present day - mid-latitude lowlands e.g. Finland
- present day - high mountain ranges e.g. Alps
- past – varied with extent of ice. Most candidates are likely to mention the peri-glacial environment of southern Britain during the Devensian. Only the very best responses are likely to convey the idea that as the ice retreated, peri-glacial environments crept northwards.

(b) It is important for students studying glaciation to appreciate the periglacial conditions and processes operating both as the climate moved in a glacial and when coming out of such a period. Too often answers about glaciation leave one with the impression that ice more or less descended onto a landscape, eroded solid rock, transported the debris and then dumped it and that is what we see today. In this question, candidates are invited to consider the role periglacial processes have at either side of a glacial period. Points include;
- nivation – e.g. often mentioned in the context of cirque formation
- preparation of rock ahead of a glacial period via intensive frost-shattering – can be related to formation and scale of features such as glacial troughs
- formation of nunataks
- increased efficacy of plucking / quarrying as a result of frost action
- frost action post-glacially generating extensive scree slopes e.g. south-west facing side of Nant Ffrancon; pro-talus ramparts
- peri-glacial mass movements modifying glacial landforms e.g. solifluction lobes in cirques
- tors
- blockfields
- patterned ground
- rock glaciers

Option 4: Hot arid and semi-arid Environments

10 (a) Describe the various ways in which hot arid and semi-arid environments can be defined. **[20]**

(b) Explain the causes of aridity in hot arid and semi-arid environments. **[25]**

(a) Definitions of aridity and effective precipitation are explicitly mentioned in the Spec. and we can, therefore, anticipate convincing accounts of these. Modern definitions are based on the concept of water balance, the relationship between the input of water as precipitation, losses due to evapo-transpiration and any changes in storage e.g. soil storage, groundwater, lakes and rivers. In arid areas there is a deficit in a year and the size of that deficit determines the degree of aridity. It is potential evapo-transpiration that is calculated since the actual amount of evapo-transpiration will vary with many factors, not least of which whether there is any water to evaporate in the first place. Many candidates will use Thornthwaites general aridity index.
When P = PEt index is 0; when P = 0 index is –100; when P greatly exceeds PEt index is + 100.
Climates with index values 0 - -20 are considered sub-humid; between –20 and –40 semi-arid and below –40 arid. Meig further divided the last category into arid and extreme arid, the latter being when a location had at least twelve consecutive months without any rainfall.
A straightforward statistical definition has arid areas as receiving >250 mm of annual precipitation.
Effective precipitation is that part of the total precipitation, which remains after evaporation and which, is available for plant growth. In hydrological terms it is that part of the precipitation which enters a stream channel.
It will be the quality of the factual detail and the nature of the discussion that will inform the AO1 + 2 marks in particular.

(b) Responses should include, for top-level marks in AO1 + 2, consideration of the causes of aridity and how these are similar and different amongst the arid and semi-arid locations. AO3 will assess the clarity with which the response links the causes with aridity. Points include;

- global circulation – sub-tropical high pressure being the downward limb of the Hadley cell.
- rainshadow effect – prevailing winds in sub-tropics are trade winds blowing from NE in Northern Hemisphere and SE in Southern Hemisphere. Barriers such as Andes prevent moisture reaching western slopes. Greater extent of desert where relief barrier in east e.g. Australia. This point likely to be an indication of a Level 3 response in AO2
- linked with trade wind direction is point that where trades blow from sea, their moisture is precipitated on eastern coasts leaving little moisture for mid-continental areas e.g. Gobi desert and Great Basins and Mojave deserts
- ocean currents and prevailing winds e.g. Namib and Atacama deserts
- a level 3 response in AO2 might be indicated by mention that most deserts are the product of a combination of factors e.g. Atacama – high pressure; rainshadow and upwelling of cold water

11 (a) Describe the depositional role of water in hot arid and semi-arid environments.   [20]

(b) Explain how people can use and misuse water resources in hot arid and semi-arid environments.   [25]

(a) The nature of the run-off pattern in deserts is often one of short-lived high-peaked floods produced by a combination of occasional torrential showers and favourable ground surface conditions. Despite their low precipitation, deserts are areas where fluvial action may be important. Points include;

- sediment yields can be high so there is plenty of suspended load for rivers to deposit
- alluvial fans – a major component of desert drainage systems – opportunities for AO4 marks via diagrams/sketches. The better responses, Level 2+ AOs 1+2 are likely to mention the shape and aggradation characteristics i.e. coarse and fine depositional patterns
- coalescing fans - bajadas
- playas – basin and range in south-west USA for e.g.
- wash in-fills in arroyos and in low relief valleys
- evaporation to create salt flats

(b) It is important that responses here focus on <u>explanation</u> and that a purely descriptive answer should not reach Level 3 in AO2 + 3.

The Spec. specifies use and misuse of surface and ground water resources, problems of irrigation, salinisation. There is plenty of material that the candidates should have encountered regarding this topic and we should anticipate some very convincing exemplification. The misuse might feature more strongly but this should not preclude a good mark being awarded but we should reserve Level 3 in AO3 for those who genuinely attempt to deal with both use and misuse. It would be good to read responses that mentioned strategies such as nomadic herding as one way to conserve water supplies. The use of oases is another interesting area of study.

12 (a) Describe the processes by which rock is weathered in hot arid and semi-arid environments. [20]

(b) Examine the erosional role wind can have in the formation of desert landforms. [25]

(a) The Spec. specifies thermal fracture, exfoliation and chemical weathering. The quality of the description of each of these will inform the mark for the AOs. Given the importance of salt weathering, the omission of this is an indication of a Level 1 response in AO 1 + 2. Points include;

- thermal fracture – cracking of rocks due to rapid changes in temperature.
- exfoliation – breaking, splitting and peeling off of outer rock layers. Essential factor here, and with thermal fracture, is the variation in coefficients of expansion of the materials making up the rock e.g. different minerals. The term insolation weathering is likely to be widely employed
- freeze thaw
- pressure release
- chemical weathering – wherever water is more freely available almost any of the types of chemical weathering can occur. Some types overlap with the mechanical category e.g. salt weathering. Rock surfaces commonly impregnated with soluble salts as evaporation > precipitation. Salts can then disintegrate rocks by the growth of crystals from solutions and the expansion of hygroscopic salts on hydration

(b) The importance of wind has been given a changing emphasis in desert geomorphology. At times it was pre-eminent, at others relegated to a minor role. Today, wind erosion is regarded as significant in some deserts. This question is clear in its focus on erosion and so comments about dunes are irrelevant. Points include;

- abrasion – physical impact by wind-borne particles – widely thought that sand sized particles most effective but some research indicates that silt sized particles can be effective. Abrasion confined to within 1-2 m of surface and most effective at <50cms.
- deflation – removal of loose particles – sand sized movement tends to be localised but silt and clay sized particles can be lifted by atmospheric turbulence and carries in suspension great distances. Responses containing comments about the importance of local variations in wind and surface characteristics determining effectiveness of deflation are likely to be Level 3 in AO 1 + 2
- small scale features – ventifacts, small scale pits, grooves and polished surfaces. Higher level responses in AO2 might point out the difficulty in distinguishing between the effects of wind, running water or chemical weathering
- medium scale features – yardangs c. 10m high and c.100m long, deflation hollows a continuum of sizes from <1m deep and a few metres across to the larger scale features
- large scale features – large enclosed basins – part of the continuum of deflation hollows. Pans of S. Africa c. few metres deep and over 100m across to very large features of >100m deep and > 100 km across e.g. Egypt

Option 5: Applied Climatology

13 (a) Describe how buildings can modify the climates around them.   [20]

   (b) Under what circumstances are such modifications likely to be most pronounced?[25]

   (a) Within the section 'Urban climates' in the Spec. the modification by buildings of the climate adjacent to them is, rightly, separate from the bullet point concerning the contrasting energy budgets of urban areas and their surroundings. Many candidates will see this question as an opportunity to describe both the small-scale influences of buildings as well as the larger scale issues of urban heat islands. We should credit both aspects but those who focus only on the whole urban area should not receive more than Level 2 in AO3. Points include;
   - temperature – buildings cast shade
   - sunlight – shade
   - wind – higher wind speeds between buildings, especially high-rise
   - wind – smaller scale eddies and turbulence are also found
   - with increasing height of building the frictional effect reduces and so wind speeds are higher

   (b) The best responses will pick up on 'likely to be most pronounced.' and tackled convincingly will reach Level 3 in AO3. Without this a response can still be awarded Level 2 in AO3. Points include;
   - synoptic context e.g. anti-cyclonic
   - prevailing wind
   - local variations in relief
   - building density
   - overall size of urban area
   - comments about effects on localised energy budgets are appropriate here.
   - effect of shade most effective when there are many tall buildings and at the time of year when the angle of the sun's rays is low.
   - canyon effect of high-rise buildings e.g. skyscrapers funnelling wind along relatively narrow channels with smooth sides.
   - contrasting outlines and surfaces of buildings and layout influence air movements.

14 (a) Describe how the relationship between climate and topography varies with latitude.
[20]
(b) Explain how human activities are influenced by these relationships.   [25]

(a) Topo-climates look at the relationships between topography and climate at the local scale and within this section in this Option, there is explicit mention of topo-climatic variations with latitude. Without a clear link between the three factors, climate, topography and latitude then Level 2 in AO3 must be the maximum. Points include;
- low latitudes – increasing altitude leads to amelioration of heat and increasing possibility of precipitation; reduced impact of aspect as sun rays are at higher angle
- high and mid-latitudes – increasing altitude leads to lower temperatures, more frost, greater potential for precipitation, more fog/mist, higher wind speeds; pronounced effect of aspect

(b) The more convincing responses will deal both with negative and positive influences – these are likely to reach Level 3 in AO3. The quality of the links between topo-climates and human activity will inform in particular the Level in AO3. Points include;
- low latitudes – attraction of highland areas e.g. East Africa for certain types of agriculture; altitude zonation of agriculture prominent in Andes for example
- high and mid-latitudes – same point with increasingly extensive agricultural systems higher up until forestry and then 'wilderness' take over. Use of highest areas for national parks. System of transhumance is relevant here introducing a seasonal element in the argument.

15 **(a) Describe the direct and indirect climatic effects of shelter-belts and wind breaks. [20]**

    (b) Explain how human activities are influenced by these climatic effects.   **[25]**

(a) Shelter belts and wind breaks tend to be artificially generated barriers specifically designed to reduce wind speeds. Their influence also extends to other factors as the question states. The Spec specifically mentions wind speed and turbulence as direct effects and air and soil temperature, evaporation and the water balance as indirect effects. Responses that consider all these factors are likely to receive Level 3 marks in AOs 1, 2 + 3. Points include;

- wind speeds reduced but the more secure answers will describe the complexity of the pattern
- turbulence – there is a calming effect of shelter-belts but also a degree of turbulence in the lee of the shelter
- air and soil temperatures can be increased in the lee of a shelter-belt with the effect sometimes reaching a distance of 10x the height of the belt
- evaporation is reduced in the lee
- vegetation belts to trap snow for increased soil moisture in summer e.g. Canadian Prairies

(b) As so many shelter-belts / wind breaks are deliberately generated they are designed to have a beneficial effect on human activities, most notably agriculture. A range of possible contexts are possible and it is possible for a Level 3 response to be achieved either through a broad approach covering many different applications or through a more detailed study of one or two particular examples. Points include;

- shelter for cattle – sometimes these take the form of a tunnel of vegetation in which livestock can shelter e.g. upland areas
- wind breaks to reduce wind speed in areas of low relief where arable enterprises are important. At certain times of the year the soil will not have a well developed cover of vegetation and so be susceptible to soil erosion by wind e.g. Dutch polders, Fens
- shelter for isolated buildings e.g. farmsteads on Polders

Section B

Group B Options

Option 6: Agriculture and Food

16 **Study Fig. 1 which shows part of an upland area in south-east Wales.**

   (a) Describe the physical constraints of environments such as that shown in Fig. 1 on agricultural systems.   [20]

   (b) Explain the strategies farmers might adopt when they operate in such physical environments.   [25]

   (a) The impacts of the physical environment on agricultural systems are a major part of this Option. Responses are expected to identify the upland nature of the location and can establish the influence of the various factors on agricultural enterprises. The degree to which the physical factors are linked with agriculture, both crop and animal types, will be assessed under AO3. Points include;
   - climate – colder; higher precipitation with snow common over the winter; lower sunshine totals; higher average wind speeds;
   - soils – less fertile, more leached, thinner
   - relief – steep slopes; higher altitude; aspect in deeply incised valleys;
   - hydrology – saturated soil; surface run-off when soil storage exceeded; frozen water at certain times of the year

   (b) The assessment here will depend on the knowledge and understanding of the strategies selected. These can include physical such as liming soils as well as economic such as farm diversification e.g. tourism. Simple descriptions of the strategies should not be awarded more than the bottom of Level 2 in AO2 + 3 whereas a response that genuinely tries to explain should reach upper Level 2 in AO2 + 3. Although it is likely most candidates will have studied this in the context of the British Isles, we must be open to material from similar environments located in other parts of the world. Points include;
   - soil improvements e.g. drainage of valley floors; improving the lower pastures through fertiliser
   - concentration on livestock, in particular sheep
   - use breeds tough enough to survive the harsh conditions
   - diversification away from agriculture into for e.g. tourist and recreational activities
   - use of grants and subsidies
   - abandonment of farming

17 (a) **Describe the impact of farming on the physical environment in LEDCs.** **[20]**

(b) **Account for the variations in the availability of food in the economically developing world between 1971 and 2010 such as shown in Fig.2.** **[25]**

(a) There is a wide range of possible farming practices, commercial and non-commercial from across a wide range of LEDCs. Monoculture plantations, nomadic pastoralism, subsistence rice padi, cattle ranching are some but candidates can select whichever they please. It is important for the AO3 marks that the practices are linked with impact on the physical environment such as on hydrology, soils, slopes (mass movement) and climate. AO1 + 2 marks will come from the quality of the description. If response only deals with MEDCs then capped at Level 2 in AOs 1+2 and AO3 is 0.

(b) The graph shows both regional and temporal changes in this index of food supply. For Level 3 marks in AO3 a response must make convincing reference to both these elements. The better responses might organise their accounts using headings such as physical factors and human factors. Where a response only deals with one type of factor, most likely physical then Bottom of Level 2 in AO3 is a likely maximum. Points include;
- impact of Green revolution measures e.g. HYVs e.g. South and East Asia c.f. sub-Saharan Africa
- land reform
- irrigation schemes
- improved access to markets through infrastructure improvements
- political contexts e.g. the impact of inter- and intra-national conflicts

18 (a) Describe ways in which agricultural systems can be classified. **[20]**

(b) Examine the ways in which the supply of capital affects agricultural systems. **[25]**

(a) This allows candidates to draw on a wide variety of material from across this Option. They should have a sound understanding of what is meant by an agricultural system and have seen how it operates in several different locations. Responses that point out the difficulty in classifying such diversity are likely to receive Level 3 marks in AO2. Points include;
- arable / pastoral / mixed
- commercial / non-commercial
- extensive / intensive
- sedentary / shifting or nomadic

(b) The influence of human / cultural factors is explicit in the Spec. as is the need to consider the role of capital on agricultural systems. Capital can be seen as either fixed such as farm buildings or standing such as machinery or working such as seed, fertiliser or animal feed. Responses displaying good knowledge and understanding of these are likely to be Level 3 in AOs 1 + 2 and if they are appropriately used to show how agricultural systems differ, Level 3 in AO3. Points include;
- as most farmers operate within a fixed location, their decision making operates in different ways to other economic decision makers.
- an increase in availability in capital can lead to the overcoming of physical obstacles e.g. investment in irrigation / glasshouses allows a different agricultural system to be undertaken.
- basic contrast between farmers in MEDCs and LEDCs
- contrasts within MEDCs e.g. hill sheep and arable in UK

Option 7: Manufacturing Industry: Location, Change and Environmental Impact

19 (a) Describe the effect globalisation can have on the location of manufacturing industries in both MEDCs and LEDCs.   [20]

(b) Explain the influence of Foreign Direct Investment (FDI) on one or more regional economies.   [25]

(a) Globalisation is explicitly stated in the Spec. in the context of the global shift in manufacturing and is also part of the section covering industrialisation, deindustrialisation and reindustrialisation. Descriptions should include references to both MEDCs and LEDCs, responses focusing only on one will not receive more than Level 1 in AO3. Points include;
  - both the internal organisation and the sourcing of raw materials/components and selling of finished products have become truly global for many manufacturers.
  - the emergence of TNCs has had locational effects e.g. HQ and R&D in the home country, often MEDC or NIC and manufacturing branch plants in NIC or increasingly LEDC
  - the global sourcing of raw materials e.g. mineral ores / coal / oil has been a factor in some manufacturers remaining in MEDCs

(b) The need to focus on the real world geography of one or more regions is clear and will be reflected in the mark in AO3. We should be accepting of variation in the interpretation of the scale of a region although it is likely that many responses will focus on a region such as South Wales / NE England / Nord-Pas-de-Calais / South-East China. A response might look at one region in detail or several, each in less detail; either route is capable of reaching Level 3. Points include;
  - Foreign Direct Investment has been a prominent feature of manufacturing change both in MEDC regions and LEDCs and NICs e.g. Japanese manufacturers in UK and China
  - This has brought employment and a multiplier effect – an indication of a higher Level candidate in AO2 might be discussion of how effective local linkages have been such as local sourcing of components
  - locations chosen not always traditional areas for that particular type of manufacturing e.g. Nissan in NE England; Toyota in East Midlands
  - security of employment no longer in the region nor even in the same country as TNC HQs overseas
  - TNCs can disinvest as quickly as they invest e.g. Japanese firms in NE England in late 1990s
  - higher level responses in AO2 might make the point that disinvestment highlights the globalisation and inter-dependence of the world manufacturing sector

20 With reference to one or more regions in MEDCs,

    (a) Describe how the industrial structure has changed since the 1970s.   **[20]**

    (b) Explain the causes of these changes.   **[25]**

    (a) Regions of industrial change are explicitly mentioned in the Spec., and are specified as peripheral regions, core regions and deindustrialised regions. Candidates have, therefore, a wide variety of possible exemplars. We must be open to whatever type of region is selected, although if in LEDCs then capped at Level 2 in AOs 1+2 and AO3 is 0. It is possible for AO4 marks to be gained via sketch map(s).

    (b) Points raised in this sub-part will relate directly to the example given in (a). The point about LEDCs applies to this sub-part. The more convincing responses are likely to show organisation around factors such as;
- exhaustion of local raw materials
- change in nature of demand unable to be met by existing location e.g. increased scale of ships excluded some traditional ship-building locations
- issues concerning labour
- changes in markets
- changes in basic demand for key products
- previous specialisation leaves region open to structural change
- growth regions – new resource opened up
- growth regions – acquisition of footloose industry as transport infrastructure improves; energy in form of electricity available; residential preferences of labour force
- role of government – both decline and growth

21 (a) **Describe how the internal organisation of large-scale manufacturing firms, including TNCs, affects the location of industry.** **[20]**

(b) **Explain the influence of capital on the location of manufacturing industry.** **[25]**

(a) There has been a growing appreciation of the role that the internal organisation of firms plays in manufacturing locations. The increase in numbers and scale of the larger firms within the manufacturing sector has added interesting dimensions to the study of manufacturing. There are good opportunities here for AO1 + 2 marks to be influenced by the quality of exemplar material. Points include;
- large-scale firms are often multi-plant with different plants in different locations
- for some firms locations can be in different nations – TNCs
- Firms serving global markets tend to decentralise organisation with control devolved to regional headquarters but with the HQ still in ultimate control e.g. Ford
- large-scale firms often have three key organisational elements – HQ for control and policy making located in MEDCs / NICs core regions; R&D also in MEDCs / NICs core regions; branch plants for manufacturing more footloose – LEDCs / peripheral regions in MEDCs / traditional manufacturing locations in MEDCs and NICs / new industrial locations in MEDCs.
- role of government (supra-national, national and regional/local) can help influence branch plant location

(b) Two types of capital are directly linked with a firm, financial (money) and fixed (factory buildings and machinery). Another possible influence might be fixed social capital (infrastructure such as roads, hospitals, education). Points include;
- financial capital is relatively mobile. TNCs can exploit this to invest funds in locations where profits are high and to dis-invest in unprofitable areas e.g. shift in manufacturing in some industries away from MEDCs to LEDCs and NICS e.g. textiles and clothing.
- shortage of financial capital in LEDCs is a major obstacle to manufacturing developments
- venture capital i.e. money for investing in start-up businesses and or high-risk developments e.g. some biotechnology, often highly localised. MEDCs and then mostly the core regions e.g. USA California + Massachusetts; SE in UK. Close spatial proximity between investor and industry important allows the frequent contact that is needed in the early stage of a project.
- fixed capital - role of industrial inertia
- fixed social capital – larger scale manufacturing needs the support of a developed region that will possess developed infrastructure. New investments in fixed social capital can aid in attracting industry

Option 8: Service Activities: Location, Change and Environmental Impact

22 (a) Describe how rural service provision varies from one area to another.   **[20]**

   (b) Explain how planning responses have addressed issues caused by rural service decline.   **[25]**

(a) The emphasis is on the description of changes in service provision in rural areas and where this is secure Level 3 in AOs 1 + 2 are likely to be awarded. Where a response is convincing in its description of varying changes then Level 3 in AO3 is a likely reward. Points include;
- rural areas close to urban centres – loss of low order services especially food retailing replaced by higher order services e.g. restaurants; antique shops. Loss of low order health and education services although in some areas both of these are thriving. Loss of public transport
- rural areas remote from urban centres – general loss of all services although in some locations seasonal availability is a feature

(b) The interpretation of 'planning' should be broad but to score well in AO3 needs to be related explicitly to rural service decline. Loss of threshold affects all services and comments concerning responses designed to influence population are valid if linked to rural services. The role of retirement migration and second home purchases is evident in rural areas and alters the types of services demanded and the seasonal availability. Points include;
- key settlement policy
- national parks and AONBs plans for settlement patterns
- social housing
- second home issues e.g. Yorkshire Dales / Exmoor
- Post Office post buses
- mobile libraries and banks
- encouragement of convenience 'shops' as part of a petrol retailing site

23 (a) Describe the main changes in the numbers and types of retail outlets over the past 30 years.   [20]

(b) Explain how these changes result from the interaction of several factors.   [25]

(a) Candidates may choose to adopt a broad approach to this question describing both urban and rural contexts. An equally valid approach would be to take either urban or rural environments so that top Level marks can be awarded for either breadth or depth approach. Responses that offer secure descriptions of numbers and types are likely to reach Level 3 in AOs 1, 2 and 3. It may be in the quality of the description of 'type' that the main discrimination will occur. Points include;
- overall decline in numbers
- decline in numbers of low order independent retailers e.g. food
- decline in medium order independent retailers e.g. furniture; electrical goods
- growth of national and most recently trans-national chains
- increasing scale of retailing e.g. supermarkets; superstores; hypermarkets; discount warehouses; factory outlets
- growth of diversified retail outlets e.g. the trend towards non-food items in supermarkets and the combination of petrol with food retailing

(b) Responses that directly take up the challenge of the question, that is to highlight the interaction of factors are likely to reach Level 3 in A03; without this top of Level 2 is the maximum in AO3. Examples of the type of interaction that might be expected are the rise in disposable income of many people has led to increasing personal mobility via increased car ownership. This has allowed journey to shop to be over longer distances therefore allowing less frequent but larger scale shopping trips. This allows food retailers to rationalise their stores. Through these economies of scale small-scale independent retailers are out-competed. The possibilities are wide ranging and we must be open to a variety of answers.

24 (a) Describe why, traditionally, the Central Business District (CBD) was a focus of office activity. [20]

(b) Explain why new office developments are often located away from the CBD. [25]

(a) There is the potential for a longer term historical perspective to be given here stretching back into the 19th century. Many of the buildings in the CBD date from the last quarter of that century and offer local opportunities for field-work in most urban centres that might be reflected in responses. Points include;
- relative accessibility of the centre both intra-urban and inter-urban
- prestige addresses
- face to face interaction amongst complementary services e.g. law and banking
- once a CBD began to be established support services arose that reinforced the pattern

(b) It is possible for a response to offer a strong answer using one detailed case study of a particular urban centre but equally valid is the response that offers a broad-brush approach. It is important that the focus is on offices and comments about retailing are inappropriate. Reference can be made to relocating offices and new offices. Points include;
- high rents
- technological developments making traditional buildings unsuitable for modern office practices e.g. cabling / wiring for computer networks
- planning restrictions on new developments
- difficulty in attracting and retaining staff due to congested journey to work patterns
- basic clerical activity can be located in cheaper peripheral locations and data transferred efficiently by cable to HQ
- in some sectors e.g. banking less face to face contact between supplier and client due to technology

Option 9: Tourism and Recreation and their Environmental Impacts

25 (a) Describe the trends in international tourism over the past fifty years.   **[20]**

     (b) Explain how these trends have the resulted from the interaction of several factors.
                                                                  [25]

(a) The focus is international tourism and specifying fifty years is to help candidates as regards extent of answer and therefore timing. Fifty is not intended as a rigid limit but answers that go well beyond this should not receive credit for material relating for example to the 19th century or early 20th century. Trends include both numbers and types of international tourists. Responses that go no further than simple numbers are most unlikely to reach above Level 1 in AO3. Points include;
  - numbers have seen an accelerating increase, especially over the last twenty-five years
  - spatial patterns – at first strong distance decay effect, mainly to adjacent countries e.g. UK to France; W. Germany to France; then longer distances but mostly within the same continent e.g. Scandinavia to Mediterranean; then trans-continental e.g. N. America – Europe; and more recently between hemispheres and occidental – oriental
  - types of tourism changed – at first much traditional style tourism utilising beach and climate resources; more recently a great diversity of international tourism including eco-tourism, cultural cruises, adventure holidays, theme-park based

(b) The more convincing responses will pick up the idea of 'inter-action' and show how factors are related. Done well this is likely to move the mark into Level 3 in AO3. Points include;
  - rising disposable income in MEDCs
  - changes in transport technology – one link here is the increasing economies of scale achieved by most forms of transport e.g. Boeing 747; ferries; cruise ships allowing unit costs to fall and so meet up with rising disposable incomes
  - package holidays
  - increased awareness and knowledge of tourist opportunities
  - increased education e.g. languages
  - improved health care e.g. vaccinations, but also health risks e.g. Sars
  - use of information technology helping bring down relative cost of holiday
  - potential destinations being opened up to tourism e.g. Cuba
  - many LEDCs recognising the economic potential of tourism
  - political influences e.g. inter and intra-national tensions

26 **Study Fig. 3 which shows the seaside resort of Llandudno, North Wales, in the early 1960's.**

(a) **Using the photograph and your own knowledge, describe how traditional seaside resorts have changed in the past fifty years.** **[20]**

(b) **Explain why some seaside resorts have been more successful than others in responding to change in the past fifty years.** **[25]**

(a) Resorts are the oldest type of tourist development and Llandudno is a classic example of a seaside resort founded in the 19th century. The photograph was taken in the 1960s when such resorts were still flourishing as a 'bucket and spade' location. The photograph is intended as a stimulus but one from which certain aspects can be gained. In AO3 Level 2 is the maximum if there is no reference to the photograph. Points include;
- features on photograph
- resort focussed around the bay and its beach
- railway station dominates the foreground representing the transport mode most visitors would have used – no longer used to the same extent if at all – land used for car parks / building developments
- pier – some derelict (West Pier, Brighton), some renovated (Bangor; Southwold); new facilities on pier e,g, night clubs (Eastbourne)
- large buildings lining the bay – hotels
- substantial buildings in roads land-ward of the front – boarding houses, many now self-catering flats
- features not on photograph
- theatre / concert hall (if you know Llandudno it's in the shot) – some bingo halls
- lido – new leisure centres built
- park
- social changes e.g. from family holidays to niche markets

(b) During the past couple of decades considerable differences have emerged amongst seaside resorts regarding their functioning as resorts. Some have reinvented themselves as resorts, others have looked to non-tourist functions while some now seem set in a serious spiral of decay. AO3 will assess how successful the response is at highlighting the contrasts amongst resorts. Consideration of established resorts overseas such as Spanish Costas, valid. It might be that the issue of scale of resort is helpful in assessing answers; where there is handled well then it could indicate a Level 3 response in AO 2 + 3. Points include;
- scale – the smaller resorts can be below the 'critical mass' required to generate the resources to refurbish and to add to the resort's attractions e.g. Blackpool c.f. Morecombe or Llandudno c.f. Colwyn Bay
- role of government at a variety of scales, local, regional and national e.g. infrastructure developments such as the A55T along the N. Wales coast
- extending the season – Blackpool Illuminations
- development of self-catering accommodation
- conference centres – some might argue not strictly tourism but some texts use the term 'business tourism'
- indoor leisure complexes
- new facilities e.g. marinas; golf courses

27 (a) Describe the ways in which rural areas in MEDCs are increasingly used for tourism and recreation.   [20]

(b) Examine the opportunities and problems caused by the growth of tourism and recreation in rural areas in MEDCs.   [25]

(a) The focus is clearly on rural areas in MEDCs and this restriction is counterbalanced by the use of both tourism and recreation, which allows a response to have a wide range of possibilities. There does not need to be a balance between tourism and recreation but a response that makes a genuine attempt to cover both is likely to achieve Level 3 in AO3. The possible points are many and we must be open to a varied set of responses. If a candidate chooses to focus on one particular rural area in detail e.g. Lake District, this can achieve top Level marks as can a response that has a broad-brush approach. If response deals only with LEDCs then cap at Level 2 in AOs 1 + 2, AO3 is 0.

(b) The question is clear in identifying both opportunities and problems and a response that ignores one will not progress beyond bottom of Level 2 in AO3. Those who sustain a convincing explanation of both positive and negative aspects are likely to receive marks in Level 3 in AO3. Responses such as 'visitors cause pollution.' do not move beyond Level 1 but the more specific a response then higher Level marks can be justified. Comment about LEDCs from sub-part a applies here. Points include;
- employment
- supports local services e.g. retailing
- diversification opportunities for farming
- opportunities for visitors
- problems – seasonality
- problem of low wages in this sector
- conflict between activities e.g. farming and ramblers
- conflict between economic activities e.g. forestry/ quarrying and visitors
- traffic congestion
- footpath pressure
- litter

Mark Scheme 2684
January 2005

People and Environment Options

GENERIC ASSESSMENT CRITERIA

1   Knowledge of content (0-8 marks)

Level 4	Candidates have detailed knowledge of appropriate themes, processes and specific environments and places. They have detailed knowledge of relevant concepts, principles and theories, and of a wide range of geographical terms. They have detailed knowledge of the connections between different aspects of geography represented in the specification.	**7-8 marks**
Level 3	Candidates have clear knowledge of appropriate themes, processes and specific environments and places. They have clear knowledge of relevant concepts, principles and theories, and of a range of geographical terms. They have clear knowledge of the connections between different aspects of geography represented in the specification. There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.	**5-6 marks**
Level 2	Candidates have sound knowledge of some appropriate themes, processes and specific environments and places. They have sound knowledge of some relevant concepts, principles and theories, and of some geographical terms. They have sound knowledge of some connections between different aspects of geography represented in the specification.	**3-4 marks**
Level 1	Candidates have basic knowledge of some appropriate themes, processes and environments and places. They have basic knowledge of some relevant concepts, principles, theories, and geographical terms. They have basic knowledge of some connections between different aspects of geography represented in the specification.	**0-2 marks**

2   Critical understanding of content (0-22 marks)

Level 4	Candidates have detailed critical understanding of the content of the specification and have detailed critical understanding of the connections between the different aspects of geography represented in the specification.	**18-22 marks**
Level 3	Candidates have clear critical understanding of the content of the specification and have clear critical understanding of the connections between the different aspects of geography represented in the specification. There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.	**12-17 marks**
Level 2	Candidates have sound critical understanding of some of the content of the specification and have sound critical understanding of some of the connections between the different aspects of geography represented in the specification.	**6-11 marks**
Level 1	Candidates have basic critical understanding of some the content of the specification and have basic critical understanding of some connections between the different aspects of geography represented in the specification.	**0-5 marks**

3 Application of knowledge and critical understanding in unfamiliar contexts (0-22 marks)*

Level 4   Candidates apply their knowledge and critical understanding of the specification content and connections to different aspects of geography represented in the specification, relevantly and where appropriate at a range of scales. They evaluate arguments, ideas, concepts and theories in detail.   **18-22 marks**

Level 3   Candidates apply most of their knowledge and critical understanding of the specification content and connections to different aspects of geography represented in the specification, relevantly and where appropriate at a range of scales. They evaluate arguments, ideas, concepts and theories clearly. There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.   **12-17 marks**

Level 2   Candidates apply some of their knowledge and critical understanding of the specification content and connections to different aspects of geography represented in the specification, relevantly. They attempt a basic evaluation.   **6-11 marks**

Level 1   Candidates explain contexts using basic ideas and concepts.   **0-5 marks**

* **Maximum 11 marks for application and 11 marks for evaluation**

4   Communication (0-8 marks)

Level 4   Candidates use an appropriate range of communication skills fluently and in different formats; present information within a logical and coherent structure; where appropriate, synthesise information from a variety of sources; use spelling, punctuation and grammar with a high level of accuracy; and employ geographical terminology with confidence.   **7-8 marks**

Level 3   Candidates use an appropriate range of communication skills clearly in different formats; present information within an effective structure; use spelling, punctuation and grammar with accuracy; and use a range of geographical terms.   **5-6 marks**

Level 2   Candidates use a limited range of methods to communicate knowledge and understanding; make some effort to structure their work; and use spelling, punctuation and grammar with some accuracy; and have a basic knowledge of geographical terminology.   **3-4 marks**

Level 1   Candidates use a limited range of methods to communicate knowledge and understanding; make only a basic attempt to structure their work; use spelling, punctuation and grammar with variable accuracy, and have only sparse knowledge of geographical terminology.   **0-2 marks**

Option 1: Aspects of the Geography of the European Union

1   **To what extent are regional disparities in wealth determined by the uneven geographical distribution of resources? Illustrate your answer with examples from the EU.**   **[60]**

If resources are defined widely enough (i.e. human resources such as skills, infrastructure, location and natural resources) then clearly, the uneven distribution of resources explain most regional disparities. However, many answers will concentrate on natural resources such as climate, soils, energy and minerals.

Good answers will probably achieve level 3/4 in AO3 and show either (a) a sophisticated view of the concept of resources, or (b) recognise that natural resources can only partly explain regional disparities.

Synoptically understanding (especially in AO2 and AO3) will be demonstrated through:

- a general appreciation of the economic, environmental and spatial factors which influence the location of human activity;
- specific and appropriate reference to the geography of the EU.

There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.

2 **Assess the value of the ecosystem concept to understanding transnational environmental issues. Illustrate your answer with examples from the EU.** **[60]**

Ecosystems are holistic. The idea of the interrelatedness between human activities and the physical environment is central to the management of environmental issues. Answers may focus on the movement of energy and materials through environmental systems, and associated ideas of productivity, limits, stability, biodiversity etc.

Level 3/4 answers will be discursive, focused on the relationship between the ecosystem concept and environmental issues (AO3), and show clear evidence of synopticity (AO1/2/3).

Synopticity will relate to appropriate knowledge and understanding of:

- ecosystems;
- physical and human processes responsible for environmental issues such as acid rain pollution, river pollution etc;
- relevant EU examples.

There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.

3   **Discuss the view that, in recent years, government policies have become the most important influence on agriculture. Illustrate your answer with examples from the EU.**   **[60]**

There are many influences on agriculture, of which government policies are arguably the most important. In addition to government, answers might explore the influences of the physical environment (climate, soil, relief etc.), access to markets, economies of scale etc.

Level 3/4 answers are likely to adopt a balanced view and recognise that a range of factors (apart from government) influence agriculture, including those connected with physical environment, farm technology (scientific farming, agribusiness, organic farming etc.).

Synopticity (AO1/2/3) will derive from an understanding of:

- the influence of environmental, economic and social factors on agriculture;
- the interaction of these factors;
- the CAP and other farm policies in the EU.

There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.

Option 2: Managing urban environments

4   'Squatter settlements in urban areas in LEDCs are a positive phenomenon'. How
     far do you agree with this statement?   [60]

Squatter settlements are positive in the sense that they provide a solution to the housing
problems of LEDC cities. Those living in squatter settlements gradually improve their houses
as their economic situation improves. Eventually squatter settlements may become mature
suburbs, incorporated into the urban fabric.
Squatter settlements support a range of employment opportunities in service and workshop
activities and may develop a strong sense of community. On the negative side squatter
settlements, lacking essential services, may be sources of disease.
Criminality may be high, and many settlements may occupy sites which pose hazards to life
and property (i.e. susceptible to flooding, landslides etc.) and be a fire risk.

Level 3/4 answers will provide a balanced discussion (AO3) and show awareness of
arguments on both sides. They will also be synoptic (AO12/3). They will show knowledge and
understanding of:

- squatter settlements
- the developmental context of squatter settlements in cities and in the
  countryside in LEDCs (studied at AS level)
- relevant content from the urban option in 2684

There must be evidence of synoptic connections with other parts of the specification to
achieve more than level 2.

5 Discuss the view that cities have a disproportionate impact on the physical environment.

Cities consume resources and generate wastes which cause atmospheric pollution on local, regional and global scales; pollute rivers, lakes and seas; consume the countryside; pollute soils; water etc. through landfill. (The concept of 'ecological footprint' is particularly relevant at the regional scale). The impact on the physical environment is disproportionate to the area occupied by cities (2 per cent), but less so in relation to the proportion of the world's population living in cities (around 50 per cent). However, most polluting industries are located in cities, and the sheer concentration of people and economic activities, together with greater resource consumption of urban dwellers, have a major impact at local and regional scales.

Answers achieving overall Level 3 (and certainly Level 4) will:

- present a balanced discussion;
- show an appreciation that the environmental impact of cities is related both to their populations; areal extent and concentration of economic activity (AO3);
- provide appropriate case studies/place specific examples (AO1/2/3).

Synopticity will derive from knowledge and understanding of the relationships between human activity and the physical environment, and place specific detail of cities and urban regions.

There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.

6 How and with what success have sustainable urban management policies been implemented in cities in MEDCs?

Sustainable urban management policies cover problems such as traffic congestion, urban sprawl, pollution of environmental resources, availability of resources such as water and land etc. sustainable planning responses can be interpreted widely to include:

- green belt policies;
- brownfield site developments;
- reurbanisation and revitalisation of central areas for residential as well as commercial land use;
- recycling of solid waste, water resources;
- road charging; rapid transit systems; cycle lanes; park-and-ride etc.;
- laws to limited pollution from the combustion of fossil fuels etc.

Answers scoring Level 3 and Level 4 consistently for AO1/2/3 will be based on a clear understanding of sustainability. In AO3 evaluation and discussion will be prominent rather than mere description of policies and outcomes.

Synopticity will be evident through knowledge and understanding of connections to the human impact on environmental resources and their sustainable use, and to the management policies of specific cities.

There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.

Option 3: Managing Rural Environments

7 'The current use of environmental resources in national parks and other conservation areas in MEDCs is unsustainable. How far do you agree with this view?   [60]

Sustainable use refers to a level of usage/consumption which breaches ecological limits and threatens the environment. Apart from national parks, conservation areas might include AONBs, heritage coasts, wilderness areas, national forests, national monuments etc. The pressures which threaten sustainable use come from visitors and economic activities such as water supply, energy and mineral extraction.

Environmental pressure in conservation areas occurs at different scales. The most acute problems are often localised in the most accessible areas. More isolated conservation areas (or parts of conservation areas) may experience relatively little pressure.

- Level 3/4 answers will show some knowledge and understanding of the complexity of sustainable resource use and exemplification with place specific material (AO1/2).
- These level 3/4 answers will develop relevant discussion (AO3) and avoid an excessively one-sided approach.
- Answers which demonstrate sound understanding of people and environment relationships, and use place specific detail of conservation areas, will meet the synoptic requirements at levels 3 and 4 (AO1/2/3).

There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.

8   'The impact of agriculture on the countryside in MEDCs owes more to physical than to human factors.' To what extent do you agree with this statement?   [60]

Modern agriculture in lowland regions has affected the countryside by:

- removing hedgerows and changing traditional landscapes;
- draining wetlands;
- clearing ancient woodlands and ploughing up downlands;
- destroying habitats;
- reclaiming inter-tidal areas on the coast;
- using agro-chemicals which degrade water supplies and destroy aquatic ecosystems; get into food chains and reduce biodiversity etc.

In upland regions:

- intensive stocking has often exceeded carrying capacities resulting in overgrazing and concomitant environmental degradation;
- the use of agro-chemicals has reduced biodiversity (e.g. loss of traditional hay meadows).

The impact of farming on the countryside is affected by the physical environment (e.g. lowland and upland contrasts, geology and soils, surface water and groundwater) as well as the human environment (e.g. farm enterprises, farm sizes, agribusiness/small family farms etc.). types of farming are strongly influenced by geography and attract different levels of subsidy which in turn impact on the countryside.

Level 3/4 answers in AO3 will show an awareness that the impact of farming on the countryside depends on a range of factors, both physical and human and discussions will be relevant. Level 3 and 4 answers in AO1/2 will show accurate knowledge and understanding, supported by appropriate examplification.

The main focus for synopticity (AO1/2/3) is understanding the broad relationships between agriculture and the physical and human environments.

There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.

9 To what extent is the migration of population between urban and rural areas responsible for the social and economic issues which affect the countryside in MEDCs today?   [60]

The important migration movements between urban and rural areas are:

- Rural-urban migration, often resulting in rural depopulation;
- Counterurbanisation in pressured and remote rural areas (in the former producing commuter flows).

Social and economic issues related to migration include:

- Declining service provision in rural areas;
- Unbalanced demographic structures and their social impact;
- Lack of affordable housing in areas of net migrational gain;

However, not all social and economic issues relate directly to migration e.g. lack of employment in the countryside, second homes and holiday homes.

Level 3/4 answers will focus on the relevant issues (AO3) be discursive and recognise that migration offers only a partial explanation. They will also show good knowledge and understanding of the issues, supported by appropriate examples and case studies (AO1/2).

Synoptic answers will draw specifically on knowledge and understanding of migration movements, the interaction between people and the human environment, and rural management issues (2684).

There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.

Option 4: Hazardous environments

10 To what extent does the impact of volcanic eruptions on human activities depend on the scale of the eruption?   [60]

The scale of volcanic eruptions is one factor which can influence their human impact. Massive eruptions such as Pinatubo may cause changes to the global climate (i.e. global cooling and its implications for food production). Such changes may be short-term or long-term (in the geological past massive eruptions have permanently altered global climate and large parts of the Earth's topography).

However, scale is only one of several factors. The impact of eruptions also depends on:

- physical factors such as viscosity and gaseous content of magma, whether eruptions are effusive or explosive, the nature of material erupted e.g. pyroclastic flows, superheated gases, ash, lava etc.
- human factors: prediction, hazard mitigation, evacuation procedures, population distribution and density etc.

Answers will clearly demonstrate that the impact of eruptions depends on several variables, and which adopt a discursive approach, are likely to achieve level 3 or 4 overall. Discursive answers with knowledge and understanding applied relevantly should score highly in AO3. Synoptic discussions will demonstrate an accurate understanding of physical approaches and aspect of human geography which may influence the eruption impact. They will be supported by specific examples of eruption events. Effective synopticity should be rewarded at levels 3 or 4 in AO1 (knowledge), AO2 (critical understanding) and should also be credited in AO3 (appropriate application of synoptic knowledge and understanding).

There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.

11 Discuss the view that the impact of earthquake hazards is usually greater in urban than rural areas.   **[60]**

Discussions may centre on some of the following points:

- urban areas have higher population densities and much greater investment in economic and social infrastructure. Thus damage to property will be higher in urban areas;
- because of their vulnerability and greater risks, cities in earthquake zones in MEDCs, such as Tokyo and San Francisco, will plan for earthquake disasters. Mitigation measures will include education, fireproofing buildings and neighbourhoods, strengthening high-rise buildings, evacuation and assembly procedures etc;
- loss of life due to earthquake hazards may be less than in rural areas. In rural areas the collapse of traditional buildings with heavy roofs, mud walls etc. often cause high death tolls. Secondary hazards such as fire, disease and food shortages are also likely to be severe.

Although the contention that earthquake impact is greater in urban than in rural areas, is probably on balance correct, there are many caveats that good answers will make. Again we are looking for some kind of balance: an awareness that the impact of hazards is complex, and takes account of both physical and human environmental factors. Candidates who clearly appreciate this are likely to achieve levels 3 and 4 overall. The best answers will be exemplified with specific earthquake events.

Fully synoptic answers will use knowledge and understanding of urban geography, population geography, levels of development and specific earthquake events (2684). This knowledge and understanding will be rewarded in AOs 1 and 2. The appropriateness of synoptic knowledge and understanding in relation to the question will be assessed in AO3.

There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.

12 'The effectiveness of hazard mitigation depends on the type of natural hazard.'
   Discuss and illustrate this statement. **[60]**

This is a non-specific hazard question which gives candidates an opportunity to discuss hazards such as flooding and drought studied elsewhere in the specification. (This is additional to the hazards detailed in 2684). Hazard mitigation covers a wide range of human responses designed to lessen the impact of hazardous events on people and human activity. For example:

- Earthquakes: building regulations/codes, evacuation procedures, education of populations at risk, prediction etc..
- Volcanic eruptions: evacuation procedures etc..
- Hurricanes: evacuation procedures, shelters, coastal flood embankments, forecasting etc..
- Mass movements: land use zoning, flood forecasts and flood warnings, hard and soft engineering structures/responses.

Level 3/4 answers will be discursive and recognise that the effectiveness of hazard mitigation depends partly on the scale of the hazard event. For example building codes in earthquake zones may be designed to withstand earthquakes of a given magnitude; flood defences may be designed for a 1 in 50 year event etc. They will also recognise that the effectiveness of hazard mitigation is not just a function of the scale of a hazardous event. Investment in hazard mitigation, education of the population, adherence to building regulations etc. will effect the effectiveness of mitigation. Essentially there is a distinction here between hazard mitigation in MEDCs and LEDCs.

A further line of argument which might be developed by level 3/4 answers is that some hazards are more easily mitigated than others.

- Earthquakes and volcanic eruptions are difficult to predict, and occur suddenly (often without warning) and with overwhelming power (e.g. pyroclastic flows).
- Hurricanes and floods can be monitored closely, warnings can be given, and preparations made to minimise disruption and damage.

Level 3/4 answers will be discursive and balanced. They will clearly make use of synoptic knowledge and understanding drawn from 2684 and from other areas of the specification. It should be recognised that some hazardous events (e.g. floods, droughts, avalanches etc.) dealt with in 2683 should be credited as synoptic.
Synoptic knowledge is credited in AO1; synoptic understanding in AO2; and the application of synoptic knowledge and synoptic understanding in AO3.

There must be evidence of synoptic connections with other parts of the specification to achieve more than level 2.

REPORT ON THE UNITS
January 2005

Chief Examiners Report

In this session both the AS and A2 units followed the established formats, with outcomes at unit level being consistent with previous sessions, showing a pattern of achievement approximately equivalent to previous sessions. As always there was considerable variation between centres and within centres, when considering the full cohort of candidates the examinations discriminated very well, with almost the entire mark range being achieved in all units. Indeed in all units the work produced by the top quartile of candidates displayed an impressive level of knowledge and understanding, along with an ability to apply that knowledge and understanding to answer the questions set, with the judicious use of case studies and other illustrative materials. The hard work of teachers and candidates alike is recognized by the Principal Examiners, who would like to take this opportunity to pass on their congratulations. In contrast a minority of candidates produced irrelevant answers to questions, as a result of misunderstanding the command words and requirements, thus failing to meet the requirements of all but the most simple questions, or managed their time so badly that one or more questions were left incomplete.

The following general points should be noted:

1. Some candidates do not read the information given in the stem of the question, or within the body of the question itself, and therefore make inaccurate assumptions when answering it, thus including irrelevant materials for which credit cannot be given.

2. Some candidates fail to pay attention to the number of marks available for each part of a question or alternatively they do not divide their time carefully between the questions which they have to answer. Consequently they may spend too much time on one part, often including unnecessary factual information about the topic which is unrelated to the question being asked, alternatively they may write only a short answer when much more detail is required. Timing is crucial, there were a significant number of candidates who devoted too much time to earlier tasks, in consequence having to rush their final question.

3. There are concerns from some Principal Examiners over the presentation of scripts from candidates in some centres. The following advice should be followed by centres:
a) Whether using question and answer booklets or loose sheets the front page should show full details of the candidates, including the centre number and candidate number. In those units where a choice of questions is offered candidates should clearly indicate which questions they have answered.
b) Where examination answer booklets are not being used for answers all sheets should be attached loosely by string or a treasury tag.
c) It is helpful if individual sheets are numbered by the candidates and essential that they are placed in the correct order. Questions and sub sections should be clearly labelled.

The unit reports, which follow, address the general issues and comment in detail on responses to specific tasks.

2680: The Physical Environment

General Comments

The response to this examination paper was fairly typical of the pattern that seems to be established: Hydrological Systems is by far the strongest section, with varying degrees of success in the other three questions. There are many good things that the examining team has commented upon such as:

- the noticeably good answers where compare is the command term;
- the use of data from figures in skills questions; and
- the use of case studies in the longer answer questions.

There are several areas that Centres could focus on to further improve the performance of their candidates:

- learning accurate definitions of geographical terminology;
- practice of applying case study information to answer the question, particularly for the 10 mark questions on ecosystems and lithosphere;
- the recognition of anomalies when describing spatial information; and
- recognising features on photographs and applying process to these features.

There is a lot of good physical geography being taught by Centres and it is hoped that the advice given above and the comments below are of help to continue driving up the standards.

Comments on Individual Questions

HYDROLOGICAL SYSTEMS

1 (a) (i) The knowledge of the term *discharge* was variable. Many candidates had some idea of what the term meant but lacked reference to the idea of the *volume* of water in a river. The idea of *amount* was only allowed if there was reference to it being the amount of water in the river or the units of measurement were given. Many candidates very loosely defined it as being 'water in the drainage basin' and some referred to 'rainfall' rather than water in the river channel.

(ii) The definition of *lag time* was generally well known, it being the *difference in time between the peak precipitation and peak discharge*. A minority of candidates understand the term to be difference in time from the start of the storm to the peak discharge but this is incorrect. A smaller minority omitted the reference to time and merely indicated that it was a difference.

(b) (i) This question produced some very good responses and the command term is very well understood, with directly comparative statements being written. The majority of candidates also incorporated data from

the hydrograph in their answer and so lifting it to full marks. This question was well done.

ii) Where candidates had read all of the information provided in the stem of the question there seemed to be no apparent difficulties in answering this questions. The best answers explained the hydrograph before and after urbanisation in terms of the impact that urbanisation had upon the hydrograph characteristics (peak discharge, rising and recessional limbs, lag time). Those candidates that did not answer this question well lost marks because they failed to read all of the information that was provided and hence did not explain the effect of urbanisation on the hydrograph. Many candidates instead referred to rainfall or simply extended their description of the patterns shown in the hydrograph. Candidates should be reminded to make sure they read all of the information provided – it is there for a reason!

(c) There was a wide range of case study material presented in this question, from well documented examples (such as the Three Gorges Dam project) to more local studies (such as the River Bollin). Candidates had clearly learnt a lot about specific case studies of flood control but tended to regurgitate all they knew about the case study without using the material to answer the question. There were many answers that adopted the 'write all you know' approach but showed limited knowledge of how these mechanisms of controlling the discharge actually work.

Candidates need to know that, for example, a dam will control discharge by storing water in a reservoir behind the dam with sluice gates that are opened or closed to control the discharge of the river downstream. Another example is the role of spreading grounds which will store water and allow infiltration, thus delaying the return of the water to the river and lowering the discharge of the river.

ECOSYSTEMS

2 (a) (i) There were many variations on this term, again, with many candidates having some idea of what it means but not the accurate knowledge that is required. Candidates need to know that NPP is the *amount of plant tissue created but minus the energy used in respiration*. Several candidates delved into human geography here and explained the term by referring to the production of raw materials. Clearly this was not the right context.

(ii) Descriptions of the map were generally sound but there were two main ways in which candidates could lose marks:

- by not referring to figures shown on the map, and
- by not referring to an anomaly.

The description of spatial information is something that Centres could focus on in the run up to the examination as very few candidates commented on an anomaly in the map.

(b) (i)   Most candidates knew that this was the *second level of the trophic pyramid* and that the primary consumers were *herbivores.* A small minority misread the information and explained the term primary producer rather than consumer.

       (ii)   This question was done very well by a significant majority of the candidates. There were many detailed descriptions in the changes of biomass with figures being quoted. The explanation was slightly more variable and as this is the trigger for level two it is something that should be practiced. The best answers referred to the loss of energy through respiration, decomposition, excreta, feeding and or death of species. Some candidates misinterpreted the figures as being a reference to the number of animals.

(c)   This question presented some difficulties to many candidates. Candidates identified human activities reasonably well and many made reference to a woodland (Highgate Wood remains a favourite). However, there seemed to be a distinct lack of application of this knowledge to the question. Highgate Wood is a good example of human activity but many candidates will use it and recite the history of human activity from it, rather than taking two examples of human activity and relating the effects of this on the nutrient and energy flows within the ecosystem. Of the two components of the ecosystem that were asked to be explained, the nutrient cycle proved to be the most popular with some degree of success whilst energy flows were rarely mentioned. When they were, they did not get beyond the removal of the canopy allowing more light to reach lower layers. There was rarely a mention of whether flows were increased or decreased. Centres are urged to develop the human activity to address changes in terms of energy and nutrient flows and biodiversity.

ATMOSPHERE

3 (a) (i)   Many candidates used the data provided and looked at the change of temperature from the CBD to the edge of the urban area. There was good use of figures although recognition of an anomaly was less well done. As with question 2aii, practice of describing spatial patterns and recognising anomalies could be carried out more by Centres.

       (ii)   There were some very good explanations of the difference in temperature. Two different reasons were required here – for example, stating and explaining anthropogenic heat sources warming the atmosphere at location A, the nature of the material used in area A having a higher albedo than location B so more solar radiation is trapped, thus heating the atmosphere. The most common mistake for this question was where the second factor was a mirror of the first. *Centres, therefore, should encourage pupils to think of two different reasons for such questions, rather than explaining the same factor but using each location to make it two different points.* It was generally felt that candidates were better prepared for the actual stating of a reason and then moving on to explain that factor.

(b) (i)   The meaning of condensation was generally well done, although a minority of candidates did explain erroneously evaporation.

(ii) Few candidates knew a precise definition of longwave radiation. There were two common errors:

- that longwave radiation is solar energy (i.e. shortwave radiation) and it is incoming; and
- that longwave radiation is reflected off the earth's surface.

Longwave radiation is the energy that is emitted from the earth's surface. It is the outgoing radiation.

(iii) This question was possibly the one that elicited the weakest answers. The majority of candidates had a rather confused idea of the role of longwave radiation and condensation. The main difficulty arose because candidates dealt with condensation and longwave radiation separately, rather than these two phenomena operating in conjunction. For example, few candidates could relate long wave radiation at night to the process of condensation and then the resultant weather conditions. Many did not demonstrate a satisfactory knowledge of the significance of dew point. Some candidates answered at the global scale which is different to the local scale.

LITHOSPHERE

4 (a) (i) Definitions of mass movement were generally sound, but a significant number did not refer to the movement being *downhill* or under the influence of gravity.

(ii) Only a minority of candidates correctly identified soil creep as the mass movement process that forms terracettes and rockfall as the mass movement process that forms scree slopes. The best answers explained the process of soil creep, referring to the expansion of particles and then the downhill contraction and there were small diagrams in the margin to show the process. Many answers explaining the formation of scree slopes explained weathering but failed to follow this through to include the mass movement process that forms the feature.

(b) Candidates did identify several factors that would control weathering on the rock face. However, only the better answers applied their knowledge to the area shown in the photograph and addressed the idea of the rate of weathering – i.e. an increase or decrease in the speed of weathering. There still continues to be some confusion between weathering and erosion. There were two common errors:

- failure to read the stem of the question which gives the setting and rock type of the cliff (limestone in southern Spain); and

- lack of close scrutiny of the photograph.

To improve this, Centres could practice describing and discussing photographs.

(c) As with the Ecosystems human impact question, candidates were good at identifying relevant human activities, but generally could not

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explain how these activities influenced mass movements. The link tended to be asserted rather than explained. Aberfan continues to be a popular example but the development of the role of human activity is often lacking. For example, the knowledge of the spoil heap and the underlying spring were well known. Candidates also commented on the unconsolidated spoil tip becoming saturated. What were more often than not unexplained were the consequences of steepening the spoil tip – this mean that gravity was more effective and increased the shear stress. The spring lubricated the spoil decreased shear strength so that stress was greater than the internal strength and so the material flowed down the slope. Centres should therefore consider developing such case studies further and look at the relative changes of shear strength and shear stress. Developing an answer in such a way has all of the qualities of a level three answer.

2681 – The Human Environment

General Comments

There was wide variation in the quality of the scripts submitted in this session. Those candidates achieving the highest marks were able to demonstrate their understanding in concise, well-expressed responses with appropriate exemplification. Candidates achieving lower marks tended to write brief undeveloped answers without due attention to either the specific command words in the questions or the data provided. Timing was not a problem except in some instances where candidates had written excessively in the early part of the examination; they had in effect penalised themselves towards the end by writing unnecessarily lengthy answers to earlier questions.

Overall, although there were some very good responses to Question 2 (Rural Settlement), the highest marks were achieved for Question 1 (Population) and Question 2 (Urban Settlement).

The following points evident in this examination are part of a most encouraging trend:

- **The unprompted use of brief examples in the shorter sections** (such as the 4 mark and 6 mark questions) is encouraged. This is becoming an increasingly common feature in the scripts of many candidates; this is good practice and it demonstrates in many instances a much more convincing understanding.

- Similarly **the inclusion of sketch maps and diagrams is welcomed**. There were many examples of population pyramids, relief cross-sections, urban models and sketch maps of urban and intra-urban areas and rural hinterlands. These may be relatively small, but if clear and accurate as an integral part of the answer and if appropriately annotated they are likely to be credit-worthy.

- Many candidates demonstrated competence in the analysis of the Ordnance Survey map. Explanation was often well supported by **statement of specific map evidence** such as altitude in metres, named physical features, roads by classification, distances in kilometres, suburbs using four figure references, named services plus six figure references and village names.

- In the two 10 mark sections, detailed factual knowledge of both rural and urban areas was clearly demonstrated by many candidates. The best answers were evident where candidates were able to apply their knowledge specifically to the requirements of the question. It was clear from their notes in the margin that some candidates had profited from **the preparation of brief plans for each of the more extended responses.**

The comments on each part question below include extracts from actual responses as seen in the scripts *(italics).* It may be instructive to consider these in association with the mark scheme. The intention is that they might be helpful in the preparation of future candidates. The quality of written English and the use of geographical terms are also worth consideration.

Comments on Individual Questions

1.   Population

(a)   Definition of the term natural increase was difficult for some candidates. In stating little more than the *phrase birth rate minus death rate* only one mark was achieved.

The better candidates were quite clear in their understanding with responses such *as natural increase is the increase in the population of an area when birth rate exceeds death rate* (two marks).

(b)   (i)   Comparison of the natural increase of India and Australia during the 20th century was required with reference to the two graphs. Responses which focused on contrasts in natural increase through time were placed in Level 2. For example:

In 1900, Australia has higher natural increase than India. Australia has a natural increase rate of 13 / 1000 compared to India's 6 / 1000. Over the century India's rate of natural increase increased, reaching a peak of 22 / 1000 in 1960 and then gently subsiding. Australia's rate of natural increase decreases, eventually reaching 6 / 1000 in 2000 compared to India's 18 / 1000 in 2000

It is pleasing to note that many candidates quoted figures from the graphs often leading to the award of full marks.

Where candidates merely described the birth and death rates with no reference to natural increase, Level 1 was awarded.

(ii)   Possible reasons for decline in India's birth rates were well known. Two reasons were required; many candidates moved beyond the basic idea of contraception to consider the effects on the birth rate of the changing status of women, family planning schemes and the decline in infant mortality – often illustrated with statistics and place specific examples. The following response was typical of those offering just enough explanation for full marks:

Improvements in child health care have meant that there is less infant mortality. This has meant that families no longer need to have a large number of children in order to ensure some survive to childhood. Female literacy has also improved. If women are educated then they may have less children as they have more control over their choices or may want a career instead. Contraception is now more widely available therefore there are fewer pregnancies.

A more basic Level 1 response in which reasons were not fully developed and lacked clarity is shown below:

India's birth rate, between 1900 and 2000, may have declined due to the introduction of contraception; women became more aware of careers, etc, which enabled them to put families aside and focus on careers.

(c)   Many candidates were able to state both a difference between the age structures of India and Australia in 2000 and also to provide adequate explanation viz.

It is likely that India will have a more youthful population than Australia as high rates of natural increase result in a large number of people under 18, whereas Australia will have an ageing population with falling fertility and therefore less children.

Some candidates achieved only one of the three marks available by ignoring the command word, explain; for example;

India's age structure will be more skewed having a much greater younger population than Australia who are likely to have a more ageing population.

(d)   (i)   A number of candidates were unaware of the idea of net migration gain and were awarded only one mark for answers such as:

It is where the country increases its population by people moving to the country. A typically correct response, of which there were many, was: *An increase in the population of a region or country due to the higher level of immigration than emigration.*

(ii)   There were some very good responses to this question requiring examples of the influence of net migration gain on age-sex structure. A wide variety of examples at many different scales were successfully employed. These included: internal migration of the young to LEDC cities such as Lima, Mexico City, Rio de Janeiro, and Cairo; the effects of counterurbanisation in the rural-urban fringes of MEDC cities; movement of the elderly to peripheral, rural or coastal areas in the UK. International examples often included the impact of Turkish guest workers on age –sex structure in German cities or the effects of various immigrant groups in named inner city areas of London and Birmingham.

An explicit link between net migration gain and the age-sex structure of the receiving area was required for Level 2. Responses meeting these requirements included:

*In retirement areas such as Cornwall S. England. There has been an increase in the number of elderly people moving to the area after they have retired for a better way of life. Therefore there is a higher elderly population there. Predominantly people aged 65+, especially women who tend to live longer…*and…
High proportion of economically active males. Men are, traditionally, the members of society who work for their family's living, so it makes sense for them to migrate. It is often the case that men find employment in cities and send earnings back to their families e.g. Young male (18 – 40) workers in Lima, Peru, migrating from the Andes.

2. Rural Settlement

(a)   The term counterurbanisation was not fully understood by a large proportion of the candidature. A very common type of answer (awarded one mark only) was:

…where people move out of cities and large towns into rural villages…

i.e. stating only part of the process. Definitions worth two marks included:

…the increase in percentage of people living in rural areas…

and

… the decentralisation of population to rural areas with a net loss in urban areas.

(b)   (i)   Many candidates were able to achieve a Level 2 mark by comparing the changes in population of Buckland Monachorum and Sheepstor, two parishes in SW Devon viz:

Buckland Monachorum shows a large increase between 1961 and 1971 from 1287 to 2778 and an increase of about 400 each decade from 1971 to 1991. Whereas Sheepstor has a steady population with little change. 2001 shows a decline in population for BM with 3524 from 3578 but an increase for Sheepstor from 48 to 50 in 2001.

Candidates achieving only three of the four marks available either did not cite statistics for both parishes from the census data provided, or they failed to state one of the significant trends evident for Buckland Monachorum.

(ii)   The use of OS map evidence to support explanation of the differences in population change was very clear in the answers of the better candidates. Reference to the relative proximity of Plymouth, accessibility, relief and planning restrictions were the most frequent reasons stated. An example of a Level 2 response was:

Buckland Monachorum isn't more than 6km from Plymouth, whereas Sheepstor is much more isolated. There are virtually no transport links in Sheepstor other than a few minor roads and tracks. Conversely, the A386 provides easy access from Buckland to Plymouth, meaning people will prefer to live there for convenience or commuting. The town of Buckland lies outside Dartmoor national park, meaning it is easier to obtain planning permission to build housing for new residents there.

Two well explained reasons, with OS evidence, were required for full marks.

(c)   The significance of key settlements in service provision in rural areas was not particularly well known. Most candidates referred to the accessibility of Horrabridge; some were able to develop this point appropriately as shown in the following responses:

Horrabridge has been chosen as a key settlement possibly because many roads are linked to the settlement and it provides smaller neighbouring settlements such as Walkhampton (530690) with varied services…

and

…It already has a reasonable infrastructure e.g. services (pub 5170). If services and good roads already exist the government spend less money.

(d)   The first of the two more extended questions on this paper required candidates to explain socio-economic change in rural settlements both close to and, remote from, a large urban centre. There was scope here for a wide variety of different approaches. Most candidates considered changes in population or services or both; some dealt with issues relating to housing such as second home ownership and costs of housing; others explained the impact of change on different types of rural dwellers and variations in household composition. Responses were also based on a wide variety of rural hinterlands including those of Taunton, Swansea, Oxford, Bury St Edmunds, Ipswich, Norwich, Derby, and Durham to name but a few successful examples.

Extracts from level 3 responses include:

Thurston only 10 km from Bury St Edmunds has a population of 3000 and this figure has increased rapidly due to the process of counterurbanisation. Increased personal mobility, increased affluence, changed attitudes of living in quieter more rural areas and better transport infrastructure has encouraged the change. Norton-Little-Green further east has experienced depopulation and now has only 150 people. This is insufficient to meet the thresholds of most services. The village shop and the bus service have both been lost...

and

…West Somerset has experienced both rural depopulation and counterurbanisation. Near Taunton, Bishop's Lydeard grew from 700 in 1961 to 4200 in 1991. This is because people can commute; some services benefit such as the primary school. To the north in villages such as Porlock there has been an influx of retired people. This means that house prices have increased and young people cannot afford to live there. In the hills of Exmoor there has been an increase in second home ownership. Villages such as Dulverton has experienced a decline in services with 40% of properties now second homes…

and

…Isolated inland villages such as Wighton have experienced a decrease in population, especially the economically active, over the last 40 years falling from 318 in 1961 to 212 in 1998. This led to the closure of many services such as public transport. Wighton now only has one bus route, once a day to Fakenham. The primary school has had to be closed due to lack of demand. There has been a drop in house prices. Commuter settlements such as Tunstead have seen a major increase in population, more youthful, as a result of rail electrification in the 70s cutting journey time to Norwich and London.

In some instances candidates needed to clarify the distinction between 'close to' and 'remote from' settlements and, some responses discussed only one settlement but in both cases there was often sufficient knowledge and understanding to award marks towards the top of level 2.

3.   Urban Settlement

(a)   There were many good responses to the question requiring comparison of urban land use in the two areas of Bridgetown. For full marks, two points of comparison were required, based on clear photographic evidence as in the following:

In Fig 4 the land use is for modern shops and services e.g. Manning's Showroom and Fig 5 is a residential area with one small shop. Fig 4 has multi-storey buildings, approx 3, while Fig 5 only has one-storey buildings.

(b)   Explanations of the locations of low quality housing in LEDC cities were often limited to only one reason and hence a level 1 award. This was partly because many candidates spent time accounting for the mere existence of squatter settlements or in describing their characteristics rather than explaining their location as requested.   Two well explained points were required for full marks. In the best answers understanding was often enhanced by reference to a named example. Typical examples of level 2 responses were:

Low quality housing found in large urban areas in LEDCs are found in areas of high disamenity i.e. by a train line, on a steep bank, or on an area of land which floods frequently. These are areas which they have no legal right to but have not been built on because they are usually uninhabitable. They can also be found on sites in inner cities which are waiting to be built upon…

and

…Low quality housing would likely to be found in squatter settlements (self built housing). This is on land that the occupant doesn't own and is likely to therefore be on the periphery of the city as it has the lowest accessibility to the CBD and therefore cheapest land. There is also likely to be poor quality housing near industry as land is likely to have low demand and poorer population can be in close proximity to employment.

(c)   There were a number of simplistic accounts of the location of high quality residential areas; some candidates showed little understanding of the patterns of urban land use in LEDC cities. Most of the better candidates recognised the importance of the more central locations and as in 3(b) they offered two well explained reasons. Examples of level 2 responses include:

High quality residential areas are clustered together for mutual security and are often near the city centre where the old colonial influence still exists and old grand houses can be used. They will probably be near transport routes for the best accessibility and on the best land (marginal land is left for the favelas). Potentially they could be near government buildings and property because of its safety and protection e.g. central district in Mexico City…

and

…High quality residential areas in urban areas in LEDC cities are usually owned by the very affluent and located in central areas. This gives proximity to the workplace in the formal sector and proximity to the same socio-economic class. These affluent individuals want access to social amenities and expensive stores and as transport is often limited or congested in large

cities they need to be within walking distance. Many LEDC cities have colonial pasts and so residential areas in the centre are there due to locational inertia and previous colonial past when areas were set up for trade.

(d)   The second of the two extended questions on this paper examined a familiar and wellunderstood topic. There were many high quality responses with the vast majority based on Mexico City. Even though this was the last question there were many fluent and detailed responses. Other effective responses included detailed case knowledge of Cairo, Mumbai, Calcutta and Manilla and to a lesser extent Rio de Janeiro, Sao Paulo, Brasilia and Belo Horizonte. In many instances an effective link between rural-urban migration and / or natural increase and environmental problems in these urban areas led to awards at levels 2 and 3. Where candidates merely discussed urban problems alone or demographic change alone the award was confined to level 1.   As in the case of question 2(d) a number of responses were well supported by annotated maps or diagrams. Extracts from upper level 2 and level 3 responses include:

Mexico City has undergone rapid urban growth in the past 40 years mainly due to in-migration (approximately 2000 people arrive every day) and natural increase…In Calcutta the population increase in the last 40 years has been dramatic. Push factors such as poor quality of life, few amenities and the failure of farming have caused urbanisation. In 1990 the population of Calcutta was 9 million, in 2000 this had risen to 14 million…

The population of Cairo has doubled in the last 40 years, this is due to migration as well as natural increase. This means that local authorities cannot cope in providing housing for everyone. Many of the migrants live in the Medieval quarter or the cities of the dead where conditions are very poor with up to 5 people per room…

In Mexico City the rise in population has caused overcrowding with an average of 6.3 people per household…

In Calcutta a third of the people live in bustees near the river Hooghly. The population density of these areas exceeds 10,000 / sq. km. Sanitation is inadequate, there is only 1 toilet per 25 – 30 people, no clean water, and sewage runs open along the streets. People live in close quarters, a family of 8 in one small room, consequently disease and contamination spread quickly...

The Valle de Mexico has lost 99% of its lakes, 75% of its woodland and 71% of the rural land around the city has been lost urban sprawl caused by the constant migration and urbanisation. It is estimated that Mexico City uses 60 cubic metres of water per second which has led to a water shortage. The aquifer that provides Mexico City with water is drying up and has led to water having to be transported from other regions, leaving them with a water shortage. The aquifer drying up has led to subsidence and it is said that Mexico City is sinking at a rate of between 15 cm and 40 cm per year. This subsidence has led to flooding…All the city's waste water is deposited in the Grand Canal which is then used to irrigate crops in Hidalgo…there are high lead levels in fruit and vegetables sold in the city's markets…Atmospheric pollution is a huge problem with 3.5 million vehicles and 40,000 factories producing 12,000 tonnes of gaseous waste daily. The problem is worsened by the city's location in a high altitude basin at 2,200m. In 1994 the city only passed W.H.O. standards on 20 days. The air pollution from increasing car

usage in Mexico City has worsened to an extent that breathing in air from Mexico City is harmful to human health. This pollution has led to the formation of smog which is responsible for the deaths of 3000 people a year. All these problems are the result of rapid urban growth.

There were many instances of level 3 full mark responses being achieved within the 20 lines available. The two main acceptable approaches were: providing depth, with detailed understanding of two environmental problems; providing breadth, with discussion of a wider range of problems, each in slightly less detail.

2682/01 – Geographical Investigation Written Paper

General Comments

Most candidates used the experience of their Reports constructively in order to answer Question 1. This resulted in Question 1 being a discriminator showing those who had clearly understood the programme of work leading to the Report, as opposed to those mechanically following instructions.

The objective of Question 2 was to elicit Candidate's understanding of how to set up and justify a question for investigation within the context of the AS level. The discrimination lay in the ability of candidates to justify rather than describe their choice.

The purpose behind Question 3 was to find out the understanding of stated statistical techniques commonly used in AS level investigations. Differentiation was determined by knowledge of techniques and application to previously unseen datasets.

Most candidates attempted all parts of the paper and followed the rubric. Very few appeared to mismanage the time available.

The level of difficulty for the paper was a little harder than for June 2004. Differences in the quality of responses partially reflected the nature of the schools' catchments and differences in teaching and coverage of material.

Acceptable types of response were flexible, with credit gained either by considering a few issues in detail or by looking at a range of ideas in less depth.

Summary of the Outcomes for Questions 1, 2 and 3

Nearly all candidates clearly understood the requirements of Questions 1 and 2, with Question 1 being the most easily understood, followed by Question 2. Question 3 (a) was also understood by nearly all candidates, whilst Question 3 (b) proved more challenging. candidates should be reminded that the command words be noted and considered when answering each question.

The overall level of attainment for Questions 1 and 2 was good, with most responses entering Level 2 and a good number entering Level 3. The overall level of attainment was lower for Question 3. However, it was noticeable that candidates performed well at particular questions, thereby leading to fewer very good and very poor marks. Thus, candidates well versed in their Geographical Investigation performed well in Question 1 but were not necessarily able to deal with the less predictable nature of Question 2, which is not based on their Geographical Investigation directly, but requires application of their knowledge about how to conduct a Geographical Investigation in a new context. Even those whose Geographical Investigation had been about, e.g. psammomeres, did not necessarily apply their knowledge well to the new situation. The outcome for Question 3, especially (b) may relate to candidates' knowledge and confidence in their understanding of statistical tests. Whilst the mean is easy to understand, the Mann-Whitney test is less so. See also comments below under Question 3 (b).

Comments on Individual Questions

Question 1 (a)

Many candidates reached the upper part of Level 2 for both diagrams. Few candidates erroneously produced two diagrams of the same type.

Indicative content (examples): figure (chart): title, labelled axes, labelled points and/or lines/bars where appropriate; figure (other, e.g. pie chart): title, labelled components; table: title, labelled rows and columns; map based (flow lines, isolines, dot maps, choropleths): title, scale, north, key, labelled components; photograph: title, annotations [NB: a photograph is hard to represent]; map/sketch: title, scale, north, key [NB: a map alone is not easy to represent]; figure can be located on map; models (e.g. Burgess): application of investigation data to model.

Qualities of A grade candidates: the diagram selected gives a good visual impression, is relevant, clear and has the correct technical features present.

Other comments: most candidates produced relevant, legible diagrams containing some technically correct features, scattergraphs, pie charts, kite diagrams and bar charts being most commonly used. A wide range of diagrams was produced, varying in quality from meticulous detail to vague sketches or diagrams that did not relate to the stated title. Typical omissions were somewhat disappointing to note: no scale, north sign and/or key for maps, no variables, no units for variables, no suitable title for the choice of diagram. Typical misunderstandings were: not understanding the difference between a pie chart and a proportional circle; the inappropriateness of calling a coloured isoline map a choropleth map; the difference between a line graph and a scattergraph; misunderstanding that a transect line is not an isoline; inappropriate titles, e.g. "a graph to show ….." which is irrelevant; "scattergraph" making no reference to the variables content. Other weaker suggestions included the use of the table for calculating Spearman's Rank test. A few did not state the title of their Investigation, making the ensuing responses difficult to assess.

Question 1 (b)

Most candidates entered Level 2 for the discussion of each diagram.

Indicative content: figure (chart): show relationships between 2 or more variables; show proportions; visually attractive; bars used combinations of qualitative and quantitative variables; lines used for quantitative variables; scatter used when data available for many locations, show anomalies; figure (other, e.g. pie chart): visually attractive; show proportion of components; show scale; table: exact data values; data ready for statistical analysis; map based (flow lines, isolines, dot maps, choropleths): visually attractive, location shown, provide context, show scale, show proportions/densities; photograph: visually attractive; highlight key characteristics/relationships; map/sketch: location shown; scale of site for data collection shown; provide context; figure located on map: see characteristics of figures and maps; models: able to represent results of study findings in terms of model; credit the rejection of alternative diagrams.

Qualities of A grade candidates: there is a detailed explanation of why the diagram was chosen.

Other comments: candidates who had prepared good diagrams in (a) did not necessarily do likewise in (b), i.e. even if their technical knowledge of a technique was poor, their understanding of its relevance was not.

Most candidates gave at least 2 valid explanations for their selection of a presentation method. These ranged from rather simplistic responses, such as "easy to draw", "easy to interpret" to more in depth responses relating to how the data represented key characteristics that were being examined, the representation of independent and dependent variables, to provide context, the ability to identify anomalies and as the basis for statistical tests. The best responses tended to be for scattergraphs, bar graphs and kite diagrams, about which a substantial amount of discussion can be made in terms of their usefulness in representing information. Those who had selected tables in (a) found it harder to enter Level 2 in (b). It was pleasing to note that even at the middle to weaker end, candidates were usually explaining rather than simply describing the technique.

Question 2 (a)

Most candidates entered Level 2, but few reached the top. The responses for Figure 1 were nearly always better than for Figure 2.

Indicative content: acceptable studies included: Figure 1: sand dune transects examining variables such as vegetation height, density and type, soil and air temperature, wind speed, position on dune and distance inland, human impact; beach transects of change in height, change in sediment size. Figure 2: woodland transect examining variables such as impact of change in light on vegetation type, height and density; other variables analysed included wind speed and soil temperature, slope transects; comparison of this deciduous woodland transect with one in a coniferous woodland and/or in an open field.

Qualities of A grade candidates: the question posed is suitable for a real and successful Geographical Investigation at AS level. E.g. "What is the relationship between vegetation height and coverage with changes in height and distance along a sand dune transect?" This is at the right scale, data will be available, an acceptable number of variables are suggested in order to elicit meaningful results and it is researchable at AS level.

Other comments: The majority of candidates suggested a relevant question or hypothesis. More able candidates inferred how the question was suitable for an AS study by, e.g. noting the changes of vegetation height and type moving inland across a dune transect rather than implying that all the sand dunes would be examined. Less able candidates proposed vague questions for which the scale of investigation was not clear, e.g. comparing the woodlands to a textbook model; some candidates assumed that urban development lay at the landward end of the dune system.

The quality of the response may have been affected by the overtly physical nature of the figures; however, this should not hinder the application of the general principles of setting a question for Investigation; furthermore, well reasoned human questions could be investigated. If candidates carried out a dune transect for their Investigation, they did not necessarily express the question well – although overall they did perform well. Many candidates did not fully appreciate the requirement of this question, not noting that 5 marks had been allocated per question. The teacher led nature of some AS investigations means that a significant number of candidates appeared not to be involved in the process of deciding what to investigate and this may explain poor performance on this question.

Question 2 (b)

Most candidates entered Level 2; some entered Level 3; few stayed in Level 1. Figure 1 was by far the most popular choice and the responses were usually superior to those for Figure 2.

Indicative content: two or more points of justification for the choice of question are discussed well or more points are discussed in less depth.

Qualities of A grade candidates: there is a clear explanation of geographical theory in relation to the study area; technical factors such as the scale of the Investigation, the number and location of transects and the variables selected are discussed with realistic suggestions; practical aspects such as the accessibility to the site, accessibility to data collection equipment, the ability to collect data during a single visit or more if that is relevant to the question (but not measurements over a lengthy period of time) are discussed with reference to the resource and the stated question.

Other comments: Overall, it was felt that the command word "justify" did not appear to be well understood by many candidates, leading to the use of descriptions and superficial answers; others misread the question and discussed how they would present and analyse the data collected or simply described the stages of a Geographical Investigation. The understanding of the command word largely dictated the level of differentiation within the responses. In contrast to Question 1 there was a strong positive relationship between those who had made good suggestions in (a) and those whose choice was well justified in (b). As noted above those who had studied psammomeres for their Geographical Investigation did not always consider the context of the question – some even only discussing the location that they had studied.

A wide range of possibilities was discussed by more and less able candidates. Generally, candidates accrued credit by discussing more points of justification rather than looking at, say, two in depth. The best responses combined the explanation of geographical theory in relation to the study area with technical aspects such as sampling size and locations, accessibility and the time taken to carry out the study. However, most candidates' theoretical knowledge was patchy or even incorrect in parts. Weaker candidates did not fully – if at all – consider the resource, gave incomplete theory and only considered one or two factors with little detail. Other weak candidates had erroneously suggested urban development or groynes/sea defences for Figure 1 or suggested long-term collection of precipitation/evaporation/throughfall data for Figure 2.

Question 3 (a)

Many candidates entered Level 3; very few stayed in Level 1.

Indicative content: two or more points are discussed well or more points are discussed in less depth. The answer includes one or more strengths and one or more weaknesses and it refers to the raw data set.

Qualities of A grade candidates: strengths of the mean: ease of calculation and understanding/communication; it is appropriate to this dataset because it gives one summative value from many individual values, the result is acceptable as the extremes are not too great, there is a symmetrical distribution of data, the data set is not small; it can also be used for further calculation, e.g. standard deviation. Weaknesses of the mean: it is affected by the extreme values, but cannot show the extreme values; it needs standard deviation to be calculated in order to show variation from the mean; it does not show distribution, e.g. changes during course of the day in this dataset; it takes longer to calculate than mode/median.

Other comments: this was answered well by most candidates. As with Question 2 (b) candidates usually gained credit by considering a number of points rather than just a few in detail. Few candidates did not discuss weaknesses and strengths. Weaker candidates did not consider the resource – even constructing exemplification points from an imaginary dataset. Typically, candidates noted the ease of calculating the mean and its usefulness for further statistical analysis, as well as the problem of being affected by extreme values and the restriction of one figure to represent 24 hours when pedestrian flows change

considerably. Some even supported their points by calculating some additional statistics, e.g. by breaking down the means for different times of day. Many were aware of the mode/median as alternatives, but often did not communicate their knowledge in a way that helped to answer the question. Some misunderstood the purpose of the dataset, whilst others recognised the value of this particular mean for comparing days of week or at different times of the year. Few demonstrated a good understanding of the standard deviation as a useful statistic derived using the mean. Most of the weaker candidates recognised that the wide range of result could skew the mean value. Quite a few candidates seemed to struggle to fill the space provided leading to the repetition of ideas.

Question 3 (b)

Some candidates entered Level 3; many entered Level 2; but many stayed in Level 1.

Indicative content: the concept of difference: Mann-Whitney can be used as the null hypothesis states that the 2 data sets (city and rural) are drawn from the same population or two identical populations; it tests the difference in temperature between 2 data sets; there are 2 independent data sets at an ordinal scale; all the recordings were made at the same time of day. Carrying out the test: the 2 data sets (number of readings for A and B: $n_1 = 9$, $n_2 = 9$) are ranked continuously together; the ranks of A are added together (ΣR_1), the ranks of B are added together (ΣR_2); calculate: $U_1 = n1n2 + \{[n_1 (n_1 + 1)]/2\} - \Sigma R_1$ and $U2 = n1n2 + \{[n_2 (n_2 + 1)]/2\} - \Sigma R_2$, the smallest of U1 and U2 is read off against critical value on critical values table. The meaning of the outcome and its significance: if the smallest U number is less than the critical value, reject the null hypothesis, i.e. there is a significant difference in temperature between the city and rural area at the selected level (usually 95%).

Qualities of A grade candidates: the concept of testing the difference between the two given datasets, how to carry out the test, the meaning of the outcome for the given datasets and its significance level are discussed well.

Other comments: This question elicited the most varied responses for the paper, and there problems with being able to answer this question. Although this question directed candidates to discuss the application of a particular test (Mann-Whitney) it was apparent that candidates at some Centres were not aware of this particular test, and therefore approached the question in one of several ways: no response; a "do-it-yourself" attempt, usually based around comparing means; application of Spearman's Rank Correlation; or a completely irrelevant discussion about data collection. There were a number of misconceptions: that Mann-Whitney shows whether one dataset is greater than the other; that Mann-Whitney is a test of association; that Mann-Whitney is based on the mean; that Mann-Whitney ranks the two datasets separately. Thus, most of those who had studied Mann-Whitney reached the top of Level 2 or more – it was pleasing to note the number of candidates that discussed the significance level, which is frequently a failing in the application of statistical tests. Weaker candidates did not refer to the given datasets, did not realise that it is a test of difference, did not apply confidence levels or interpret the potential outcomes; even some more able candidates took the wrong interpretation of what the higher calculated or tables value inferred.

2682/02 – Geographical Investigation Report

General Comments

The investigative report continues to be a very appropriate component of the AS course. It provides an opportunity for candidates to demonstrate their knowledge and understanding of geography whilst developing the important skills necessary for the practice of geographical investigation. For most candidates this is clearly a worthwhile experience from which they derive great benefit.

Candidates achieving the top level will have satisfied the assessment criteria as set out in the specification. It is important that all candidates are fully aware these criteria exist and approach their investigation with a secure grasp of their importance. This is not always apparent judging by the number of reports that exceed the stated word limit, some by more than double. An inherent skill of report writing is that of being concise, many candidates are failing to address this issue.

The specification identifies the five stages of enquiry, to achieve the higher marks a study must encompass stages **corresponding** to those headings. The easiest option is to use these headings exactly, but it is the stages that must be clearly undertaken. The enquiry process is important but this is a geographical investigation and the quality and validity of the geographical content is important. Therefore in identifying a question or hypothesis it is necessary for candidates to identify the theoretical context underpinning it. Better candidates often achieve this in a concise way by introducing a relevant model and adapting or annotating it to demonstrate their understanding. The local geographical context in which the fieldwork is undertaken is also important and can be illustrated by an annotated map. By undertaking both these exercises the candidate should be in a far better position to identify in their strategy a rationale for the data to be collected. Also it will make possible a more interesting geographical interpretation of the results of the enquiry by relating them positively or not, to the theoretical and local contexts previously described. It may help in avoiding the pitfall of descriptive as opposed to analytical commentaries in the final stages.

Investigations must also use primary and secondary data. It is unusual to find studies without both but it is essential that the secondary material is relevant and utilised. A map only qualifies if, for example field sites are clearly identified or there is some annotation identifying relevant local features or patterns. It is a pity more maps are not used to illustrate spatial patterns in the data collected particularly in urban and rural settlement studies. Such techniques are concise, important but time consuming skills. However by adopting a more conservative attitude to the word limit, such maps need not be an added burden. It would make a pleasant change or addition to the ubiquitous trend lines.

A third edition of the specification is in preparation and will have a clearer definition of both types of data.

'Primary data are defined as unprocessed information, this means information collected through fieldwork investigation, or material derived from other sources which might include census, telephone directories, trade directories and remotely sensed data. This material will not have been analysed and/or interpreted in any way.

Secondary data are defined as information which is derived from published documentary sources, and has been analysed and/or interpreted such as processed census data, research papers, textbooks etc.

Secondary data also encompasses sources of specific techniques and the formulae for their calculation, such as soil moisture content, stream channel efficiency, and indices such as PLVI, CBII and environmental quality. It is good practice to acknowledge secondary sources as footnotes or a bibliography.'

The 'prevalence of or freedom from' errors, is another important criteria. The specification naturally does not attempt to prescribe a sliding scale. Errors can be geographical and/or methodological, they can be recognised in any of the stages. It may be useful for further guidance to be provided identifying common errors that students should endeavour to avoid.

A worrying feature reported by all examiners is that in some Centres the degree of assistance available is distracting from the personal nature of the written account of the investigation. A degree of commonality is to be expected when investigations are teacher led, and usually involve group work with 'class' data sets. The five stages also provide a common format but within those the presentation and commentary must be the result of individual endeavour.

Overall most of the work is of an acceptable standard providing a suitable foundation for those candidates intending to undertake geography at A2. Centres must be congratulated in continuing to offer their students such a rich range of fieldwork experiences.

2683: Options in Physical and Human Geography

General Comments

As was the case in January 2004 some 2, 300 candidates sat this session's paper. Amongst this entry there was a wide variety in the quality of response although all members of the examining team were pleased to read good numbers of encouraging scripts. The exam highlighted a number of points, all of which have been noted before in previous reports.

- Stronger scripts were sharply focussed on the question set, displaying an appreciation of what knowledge and understanding to apply to the particular context of the question.
- Weaker scripts have a tendency to 'write all the candidate can remember about the topic' and in some cases not even the particular topic.
- An increasing number of candidates are making effective use of diagrams and sketch maps to communicate knowledge and understanding.
- Some candidates communicate with a clarity of language that is most impressive but others do not and are hindering their attempts to answer through a lack of precision of expression. Examiners continue to voice their concerns about the overall quality of spelling, punctuation and grammar. There are also too many scripts with no evidence of the planning of answers.

Comments on Individual Questions

Option 1: Coastal Environments

1) The causes of sea level change were well known by the majority of candidates although a crucial distinction occurred between those candidates who understood the importance of relative change and those who did not. Good points were made about the alteration to the hydrological cycle during glacial and inter-glacial periods with their consequences for eustatic and isostatic change. Less convincing were comments concerning the role of global warming as very few responses contained material dealing with the changing volume of water.

   The application of changing sea levels to coastal landform development was tackled fairly well but only a few did so with real authority. Drowned valleys were commonplace but relict cliffs, beaches and shore platforms, depositional features such as bars and slope over wall cliffs rarely featured. This sub-part did, however, allow some candidates to make very effective use of diagrams.

2) This was not a well answered question. The first sub-part asking for descriptions of the impact of human activities on coastal sand dune and salt marsh systems tended to receive responses that were dominated by the effects of trampling on sand dunes. Comments such as '…man also pollutes salt marshes.' are unconvincing. Pollution is an appropriate factor but should be given more detail, for example in this context the effect of oil spills from boats on salt marsh ecosystems. Conservation efforts were rarely mentioned.

   The second sub-part more than the first was answered too often by vague descriptions of vegetation changes across a sand dune. Here was a classic example of candidates not dealing explicitly with the question set, that is the role of vegetation in the formation of sand dunes and salt marsh. Links were not often made between vegetation and the formation of

humus and the modification of the soil allowing other species to succeed for example. The names of plants (English or Latin) were not readily forthcoming, especially those found on salt marshes, which was disappointing given that this is an A2 paper dealing with a specialist option.

3) This was a popular question in answer to which good descriptions of how the sea erodes were given but less convincing explanations offered of the roles of lithology and sub-aerial processes on cliff and shore platform development. The key erosional processes were known by the majority of candidates and many extended their answers successfully to include wave type.

Sub-part (b) saw little material on shore platforms and cliff development in terms of shape was too rarely associated with lithology. In this context some good material was seen dealing with situations when sands are found on top of clays. Rock types such as granite were hardly mentioned and yet offer good material for the influence of both lithology and sub-aerial processes. Generally examiners were very disappointed with the responses they read.

Fluvial Environments

4) Most candidates choosing this question were able to describe a riffle and pool sequence with good knowledge and understanding. There were some effective diagrams that communicated effectively both the nature of pools and riffles and the combination of these features along stretches of rivers. The one significant weakness was the omission of consideration of the contrast in flow in pools and riffles under high and low flow.

In sub-part (b) there was a wide variety of responses from those who focussed clearly on the topic of meander formation to those for whom such a consideration was beyond them. The better scripts made convincing references to the sinuous nature of the thalweg and the helicoidal nature of water movement. The weaker responses tended to offer rather simplistic descriptions of meanders, their cross-section and plan.

5) Descriptions of the main erosional processes were clear and generally authoritative. The better responses extended their answer to include one or other of vertical / lateral / headward erosion.

In sub-part (b) the responses tended to divide into two types; those where the processes were well understood and the Hjulstrom curve employed to structure the answer; and those who offered general comments about the three processes separately and did not see links between either each process and velocity.

6) Few candidates chose this question. In sub-part (a) some candidates tended to focus on hydraulic radius to the exclusion of aspects such as bedload friction and Manning's equation. The better responses included not only these factors but also mentioned the role of width-depth ratios to help understand channel efficiency.
Generally sub-part (b) was not well handled with two important factors, bank material and bankfull discharge, rarely included. Many answers chose only to deal with channel shape at a meander which although relevant lead the response to a limited outcome.

Glacial and Periglacial Environments

7) This popular question drew a wide variety of answers from the highly competent to the barely adequate with the majority offering answers that reflected a sound understanding of the glacier as a system, some employing diagrams that conveyed their knowledge in a convincing manner. The inputs and outputs were generally well known but

only a minority acknowledged the existence of stores and processes. The link between a system and the idea of mass balance was identified by the stronger scripts.

In sub-part (b) there were some confident responses that dealt convincingly with the idea of advance and retreat and the resultant landforms. A feature of the stronger answers was the inclusion of the idea of earlier depositional features being reworked by later re-advances extending further down the valley. Some candidates saw this as an opportunity to write all they could remember about glacial deposition and generally the explicit association between movement and landform development could have been stronger.

8) There were many fine descriptions of the glacial landforms shown in the photograph. The better responses were from candidates who looked in detail at the resource and gave descriptions clearly based on both their existing knowledge and the circumstances of the photograph. Thus good use was made of the misfit water course reworking the glacial trough for example. It was particularly encouraging to read responses containing sensible allocations of scale to the various landforms.
The second sub-part was characterised by a tendency to offer too generalised discussions of glacial processes. Candidates were keen to write about how glaciers erode and so answered the particular question almost incidentally. The better responses made reference to successive glaciations and how at one point this are would have been over-ridden by ice sheets to smooth the upper slopes while at a later time ice excavated the steeper slopes that form the deep notches that are such a prominent part of the plateau edge.

9) Few responses to this question were read. There were some authoritative definitions accompanied by strong descriptions of present distributions but the past was something of a mystery to most candidates.

Sub-part (b) tended to be a catalogue of periglacial landforms. It is disappointing that candidates seem unaware of the role of peri-glacial processes in advance of a period of glaciation and the modification of landforms as glaciers retreat.

Hot arid and semi-arid Environments

There were few Centres offering this Option in this session, which limits the extent of the comments that can be offered.

10) Definitions of aridity tended to be sound to authoritative and some responses made effective use of the idea of water balance.

Explanations of the causes of aridity in the second sub-part were generally well known and much effective use was made of sketch maps and diagrams. There is one specific location about which there seems to exist considerable confusion and that is the role of the rain shadow effect in South America on the Atacama and Patagonian deserts.

11) Only a handful of responses to this question were seen.

12) There were some very impressive answers to both sub-parts of this question from candidates who not only had secure knowledge and understanding but also could apply these directly to the question set. Descriptions of weathering processes and explanations of landforms containing an element of aeolian erosion were often enhanced through the presence of appropriate diagrams. The very best candidates were frequently distinguished by their knowledge of the scale of landforms.

Applied Climatology

Very few candidates chose to offer responses to these questions, 13, 14 and 15, so comments that have some general application cannot be made.

Agriculture and Food

16) Responses to this question based on the photograph of an upland environment in the British Isles were generally disappointing. Examiners reported reading too many scripts that relied on vague assertion such as '…the area is too steep / high / cold …' and did not relate such constraints directly to agricultural systems. The question does not directly request examples but references to the real world would have helped many candidates offer more convincing answers. The application of some general principles of the physical inputs to agricultural systems was poorly understood and too many candidates offered types of physically constrained locations that were nothing like upland Britain, such as the Sahel.

Again in response to sub-part (b) there was too little depth and detail and the range of answers extended to regions such as Amazonia and the Sahel. Candidates did not discriminate from amongst their knowledge and understanding to select strategies appropriate to the particular location. Thus the use of polythene tunnels to raise strawberries was not suitable!
Having offered these rather harsh comments it must be noted that some candidates were able to offer most convincing responses to both sub-parts, in which a range of impressive geographical knowledge and understanding was applied with clarity to the context of the question.

17) This the second most popular question in the Option drew a wide range of responses as regards their quality. The better answers clearly linked the type of farming practice with detail about the environmental impact, often with convincing details regarding the locations where this occurred. Weaker answers tended to offer little more than a brief outline of a farming type, tentatively linked to an impact on the physical environment. A not uncommon example was '… nomadic pastoralists wander around with their cattle and this causes desertification.'

The sub-part highlighted a clear divide amongst the candidates. On the one hand were those who made effective use of the resource, quickly picking up on the clear contrast between sub-Saharan Africa and Asia. They went on to make explicit the links between these changes in food availability and factors such as land reform, irrigation schemes and the application of science to the raising of yield as in the Green Revolution. On the other hand were candidates who did not progress beyond assertions such as '… some areas have better climates…' or '… some areas have been at war…'. In particular a lack of knowledge and understanding about sub-Saharan Africa was disappointing.

18) The candidates who answered this question tended to offer convincing descriptions of classifications of agricultural systems mentioning contrasts such as arable / pastoral and commercial / non-commercial. These descriptions were frequently supported with appropriate exemplification.

Sub-part (b), however, was less well answered. The more successful responses used a structure such as the farm as a system to identify the influence of capital as

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an input of the type of farming enterprise. This approach was, however, all too often absent so that the response rather lost a sharp focus and wandered off into a general discussion about agriculture.

Manufacturing Industry: Location, Change and Environmental Impact

19) Most candidates have an encouraging knowledge of the way in which globalisation influences manufacturing location. Responses placed this clearly in the context of TNCs where the organisation and patterns of manufacturing locations were highlighted. Thus the different locations of HQ, R&D and various types of manufacturing were well known by many.

In the second sub-part some candidates wrote impressively about a region such as South Wales or the North East of England. They knew about the types of industries that had been influenced and could relate this to the regional economies via points such as the multiplier effect and its influence on generating employment. The better responses took this further and made the link with the generation of tax income that could feed through to improvements in infrastructure.

20) This question tended to generate some very strong responses but also some disappointing answers. The key factor here was how well a candidate knew their chosen region(s). The vast majority selected a region from the British Isles, South Wales and North East England the most common choices but there were some interesting references to regions such as the Ruhr and the Great Lakes region. The better responses dealt directly with 'industrial structure' making convincing general points about deindustrialisation and reindustrialisation. It was, however, disappointing that some candidates were not up to date in their factual knowledge with references made to firms relocating to a region but who have more recently closed down. This was also an example of a missed opportunity for the use of well annotated sketch maps to convey a good deal of the description.

Explanations in sub-part (b) matched the variety in quality of the first sub-part. Mostly the focus was on local raw material depletion, labour issues and the role of government.

Nearly all the answers to this question focussed on regions of decline and while these were relevant it is hoped that centres do study growth regions such as parts of the USA and Europe where manufacturing growth of industries such as high-tech has been prominent over the past few decades.

21) This question was chosen by only a few candidates who tended to write with authority in sub-part (a) but failed to display sufficient knowledge and understanding in the second sub-part to be convincing. In (a) there were many detailed accounts of individual firms, mostly TNCs, through which the different locations of HQ, R&D and various manufacturing plants were exemplified. The examples chosen tended to range across both MEDC and LEDC locations and thus give a good geographical feel to the answer.

Considerations of the role of capital on manufacturing location were generally disappointing and some candidates borrowed too heavily from their studies in economics and thus tended to write a response that lacked a spatial setting. The weaker candidates confused capital with costs, while others only dealt with the idea of capital-intensive industries, offering descriptions of such industries but rarely looking at their locations.

Service Activities: Location, Change and Environmental Impact

Only a few Centres entered candidates in this Option so only a restricted range of comments of general application can be made.

22) Only a few responses to this question were seen. In sub-part (a) rather simple descriptions were mostly offered, sometimes of just a couple of villages but such answers had good potential if they contrasted villages close to urban areas with remote rural villages.

In sub-part (b) some of the weaker answers did not restrict their material to planning responses but there were some very convincing accounts of recent planning legislation.

23) Several responses here focussed on the issue of decentralisation and failed to address the issues of numbers and types of retail outlets. Those that did structure their answer to the actual question offered a variety of approaches both rural and urban, either of which was acceptable.

As with other questions in alternative Options, sub-part (b) asked for a focus on the ***interaction*** of factors to explain the changes. Candidates who made a genuine attempt to do so generated more convincing answers than those who simply wrote 'all they could remember' about the causes of retail change. There was good coverage of factors such as increased personal mobility and the ability of households to store more food for longer, but too little attention was paid to the changing internal organisation of the food retailers for example. The sophistication of the supply chain and its impact on location and numbers of outlets was insufficiently emphasised.

24) A popular question within the Option, this tended to generate some strong responses, although there were a significant number of candidates who wrote rather superficial answers. Some candidates offered interesting material of an historical perspective on CBD office activity and then linked the changes outlined in sub-part (b) most effectively with reasons why new office developments are often located away from the traditional focus of the CBD. A good number of answers wrote with authority that used detail and argument most effectively.

Tourism and recreation and their Environmental Impacts

25) This was a popular choice within this Option. Generally candidates wrote securely about the main trends in international tourism with the better responses offering convincing treatment of the changes in scale and spatial patterns. It is disappointing that a significant number of candidates seem not to appreciate the temporal sequence of developments.

In sub-part (b) candidates who wrote secure responses were those who picked up the idea of inter-action amongst the factors. For too many candidates, this section of their script consisted of a list of factors, correct in themselves, but not organised as to interaction. Large numbers of candidates gave detailed accounts of the Butler model the application of which to this question was difficult to achieve.

26) This was also a popular question but tended to be answered with responses that did not focus clearly on the question and in which candidates tended to offer an 'all I can remember about seaside resorts' style. Many answers were set almost entirely in the context of the Butler model and proved to be largely irrelevant as change was not described. Too many responses only considered the rejuvenation stage and did not consider changes through time. The better responses focussed on the physical changes that many resorts have gone through and used the photograph to highlight some of these. For example effective comments could be made using the extensive railway station shown on the photograph and noting the change to car borne tourists that dominate today with the resultant increase in demand for car parking. Answers that stood out were those where the candidate offered a model of the land-use typically found in a sea-side resort, compared this to Llandudno and highlighted likely changes. Comments about social change in the composition of the tourists were welcome.

Sub-part (b) drew responses that covered the complete range of quality. Generally success was more convincingly explained than a lack of success in attracting visitors. The better

answers contained detailed exemplification, Blackpool and Bournemouth for example, but too often the 'why' element of the question was ignored.

27) Although answered by fewer candidates than the other two questions in this Option, generally the answers were sound to strong. In the first sub-part the better responses tended to be generated by those candidates who offered a breadth of material usually from a variety of locations. Those candidates who had a systematic knowledge and understanding of the resources tourism can use were best placed here.

In the second sub-part most candidates offered a sound range of factors but there was a tendency to focus on the problems at the expense of the opportunities. Too many scripts offered a weak acknowledgement of the positive impact tourism and recreation can have such as '…they give more jobs in an area.' Some exemplification is required and the very best answers were able to offer some statistical support for their points. These were also the responses that gave a more even treatment to social and economic factors and did not simply offer a catalogue of environmental issues. Too often the weaker scripts relied on phrases such as '…a major problem is pollution / litter / erosion …' without specifying the type and extent of the problem in an actual location. It was, however, encouraging to read answers making effective use of examples from outside the British Isles, the USA and Australia for example.

2684 - People and Environment

General Comments

This report on the work of candidates for the People and Environment unit has to be viewed against the background of what is a very small and unrepresentative entry in January.

However, the examination highlighted a number of general points common to previous reports.

- Many answers were only partially synoptic. Too many candidates continue to ignore connections with other aspects of the specification and draw on only a limited range of knowledge and understanding of geography. This is despite the fact that questions on this unit explore very broad themes such as the relationship between people and the physical environment, and government influences on spatial patterns. A knowledge and understanding of the content of the 2684 options is not enough to access the two higher levels of attainment. Content drawn and used from other areas of the 7832 specification ensures that candidates meet the synoptic requirement.

- Inaccurate use of geographical terminology and in many instances only a simplistic understanding of geographical patterns, processes and change.

- Too much description and too little discussion and evaluation. It should be emphasised to candidates that all questions are discursive and provide opportunities to present a reasoned argument and make judgements. Many answers require a balance. This approach is an integral part of the best answers: weaker answers tend to reserve any discussion and evaluation for a brief conclusion.

- Where appropriate more use should be made of sketch maps and diagrams as alternative, and often more effective ways, of presenting knowledge and understanding.

- Inaccurate spelling, punctuation and grammar. The mark scheme assesses written communication and too many candidates are negligent in this area. Common errors include a failure to capitalise place names, a reluctance to write in paragraphs and the misspelling of common geographical terms and place names.

- Some weaker candidates write two or three inappropriate introductory paragraphs that contain correct factual knowledge but it is not directly related back to the question under discussion, or synoptic in nature.

- Many weaker answers lack place specific details and, in particular, have much superficial, inaccurate case study material ('E.g. Brazil').

- Candidates should appreciate that they are invited to write on complex issues, processes and relationships; that there are no simple answers; and that their writing should reflect this. Many answers at a high level use synthesis, drawing two concepts together to arrive at a point of evaluation.

Comments on Individual Questions

Option1 Aspects of the Geography of the EU

Few candidates chose to answer on this option.

Question1 - was infrequently well answered with resources narrowly defined. Natural resources were understood, but human resources such as skills and infrastructure were rarely cited. It was disappointing that the case study material was not more broadly drawn from the EU of 25, identifying both pattern and anomaly to illustrate points: Good case study material within this option is highly synoptic.

Question 2 – was not tackled by any candidate.

Question 3 – was generally confined simply to an evaluation of the Common Agricultural Policy. Reference to other government policies would have been welcomed.

Option 2 Managing Urban Environments

This option remains popular, with many answers on all three questions.

Question 4 – A very popular question. At best candidates showed a wide range of case study material from three continents, contrasting the experience. The highest level answers gave balanced arguments on the positive and negative aspects of squatter settlements. Few candidates recognised or evaluated the processes operating that cause the settlements. Candidate should be encouraged to move beyond generalised and stereotypical descriptions of squatter settlements.

Question 5 – Again, the best answers presented a balanced discussion and showed an appreciation that the environmental impact of cities is related to their populations, areal extent and concentration of economic activity. The important concept of ecological footprint was rarely mentioned, nor that whilst the impact on the physical environment is disproportionate to the area occupied by cities (2%) it is less so in relation to the proportion of the globe who live there (50%). Too many candidates just wrote of housing.

Question 6 – The few good answers had a secure understanding of the sustainability concept and also policies designed to have a sustainable quality. High level answers evaluated and compared policies rather than simply described policies and their outcomes. Candidates should be made aware of the difference between social, environmental and economic sustainability.

Option 3 Managing Rural Environments

Question 7 – Only one candidate answered this question. Little emphasis was given to environmental pressure in the 'other' conservation areas nor the relevant idea that usage may come from other than tourism in secondary industry, water supply or agriculture.

Question 8 - A popular question. The very best answers saw a contrast between upland and lowland regions and the impacts on them. It was disappointing those human factors such as farm size, agribusiness and government policy did not feature to balance the strong physical aspects which influence agriculture. The environmental disbenefits of agriculture were often over emphasised: Positive agricultural inputs such as landscape improvement and sustainable management were ignored.

Question 9 – The question asked for an assessment of the extent of the influence of migration. There was a tendency to ignore factors other than migration such as employment adjustment and second homes. Case study material was often simply limited to popular textbook examples.

Option 4 Hazardous Environments

Almost all candidates attempted questions on this option, all three being equally popular. Overall there were too many unhappy attempts to force the Tsunami/Earthquake disaster of 26th December 2004 to be a multi-purpose case study in questions 11 and 12.

Question10 - All candidates saw scale as only one factor in impact. Fewer saw the scale as having possible short term or long term impacts. Fewer still saw the impact as a function of both physical factors (viscosity, gaseousness, effusive versus explosive volcanoes, pyroclastics etc) and the rather more obvious human factors, principally mitigation and population density.

Question 11 – The most popular question. It was often well answered, balanced between urban and rural as well as comparative between LEDCs and MEDCs, although weaker answers listed a description of earthquake hazard event and added an evaluative paragraph at the end. Fully synoptic answers used knowledge of urban and population geography, levels of development and specific earthquake events.

Question 12 - Many answers were disappointing with candidates struggling to cover too many types of hazard within time, simply describing different forms of mitigation This non-specific hazard question gave the opportunity (synoptically) to involve hazards such as flooding and drought studied elsewhere on the specification. Stronger answers could be discursive and evaluative, differentiating between LEDC and MEDC and that some types of hazard are more easily mitigated than others.

Advanced Subsidiary (3832) &
Advanced (7832) GCE Geography A
January 2005 Assessment Session

Unit Threshold Marks

Unit		Maximum Mark	a	b	c	d	e	u
2680	Raw	100	70	63	56	49	42	0
	UMS	120	96	84	72	60	48	0
2681	Raw	75	55	49	43	38	33	0
	UMS	90	72	63	54	45	36	0
2682 01	Raw	60	40	37	33	30	27	0
2682 02	Raw	15	11	9	8	7	6	0
2682 Opt A	Raw	75	51	46	41	37	33	0
	UMS	90	72	63	54	45	36	0
2683	Raw	90	69	62	55	48	41	0
	UMS	90	72	63	54	45	36	0
2684	Raw	120	89	79	69	59	50	0
	UMS	120	96	84	72	60	48	0

Specification Aggregation Results

Overall threshold marks in UMS (i.e. after conversion of raw marks to uniform marks)

	Maximum Mark	A	B	C	D	E	U
3832	300	240	210	180	150	120	0
7832	600	480	420	360	300	240	0

The cumulative percentage of candidates awarded each grade was as follows:

	A	B	C	D	E	U	Total Number of Candidates
3832	14.7	33.9	62.7	83.6	96.6	100.0	181
7832	11.1	48.1	100.0	100.0	100.0	100.0	28

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Information Bureau

(General Qualifications)
Telephone: 01223 553998
Facsimile: 01223 552627
Email: helpdesk@ocr.org.uk

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INVESTOR IN PEOPLE