



**GEOGRAPHY
HIGHER LEVEL
PAPER 2**

SPECIMEN

2 hours

INSTRUCTIONS TO CANDIDATES

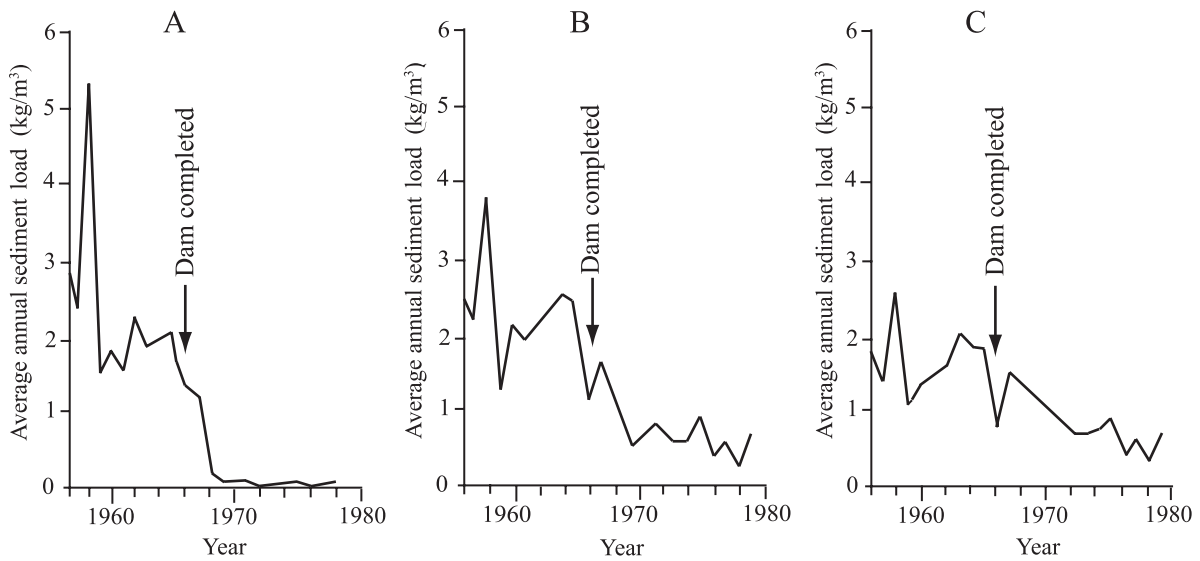
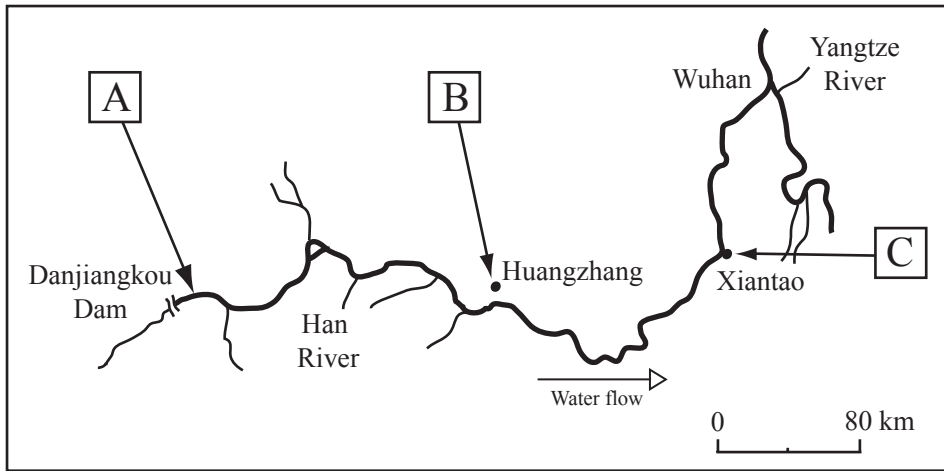
- Do not open this examination paper until instructed to do so.
- Answer three questions.
- Each question must be selected from a different optional theme, A – G.
- Do not answer two questions on the same optional theme.
- Use case studies, examples, maps and/or diagrams where relevant.

Answer three questions. Each question must be selected from a different optional theme. (Do not answer two questions on the same optional theme.)

Wherever possible, answers should include case studies and examples, and where relevant, large, well drawn maps and diagrams.

Optional Theme A — Freshwater – issues and conflicts

- 1. The map shows the location of the Danjiangkou Dam on the Han River in China. The graphs show the sediment loads at three places (A, B, C) downstream of the dam.



[Source: Nick Middleton (1999), *The Global Casino*, Arnold]

- (a) (i) State the year when the highest sediment load occurred. [1 mark]
- (ii) State the volume of sediment load in that year at Huangzhang. [1 mark]
- (b) Identify **three** ways in which the load of a river is transported and briefly describe **one** of these ways. [3 marks]

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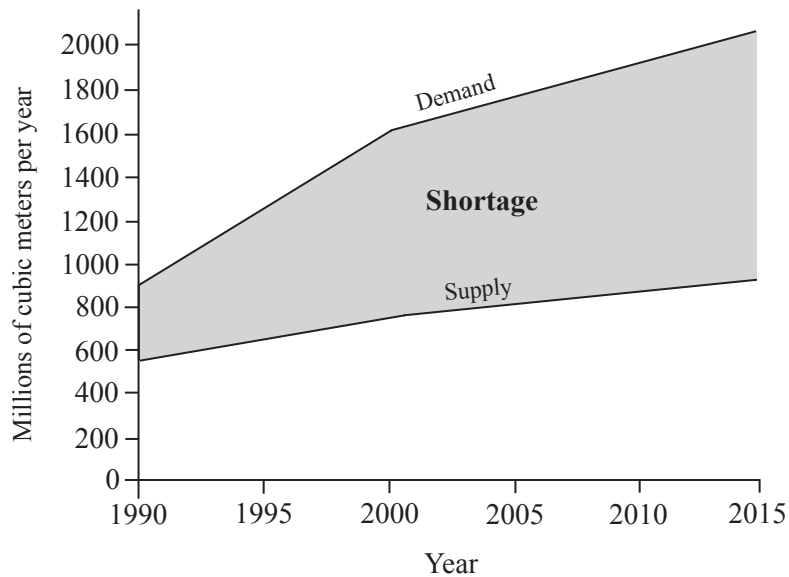
(Question 1 continued)

- (c) Referring to the map and graphs, explain how the construction of the Danjiangkou Dam affected sediment loads along the Han River. *[5 marks]*
- (d) Examine the influences of physical factors and human activity on a specific river flood. *[10 marks]*

(This Optional Theme continues on the following page)

(Optional Theme A continued)

2. The graph shows the supply and demand for water in an unnamed country from 1990 to 2015.



[Source: adapted from an edited version of *Water Pollution Control – A Guide to the Use of Water Quality Management Principles* (1997), WHO/UNEP]

- (a) Describe the trend in water shortage between 1990 and 2015 shown on the graph. [2 marks]
- (b) Suggest possible reasons for the changes in supply between 1990 and 2015 shown on the graph. [2 marks]
- (c) Analyse **two** competing demands for water in a named river basin. [6 marks]
- (d) Referring to **one or more** examples, examine the environmental effects of ground water abstraction and irrigation. [10 marks]

Optional Theme B — Oceans and their coastal margins

3. *If you choose to answer this question refer to the map on page 2 in the Resources Booklet.*

The map shows the age of oceanic crust.

- (a) Referring to the map, identify the type of plate boundary shown on the map at:
- (i) A,
 - (ii) B. *[2 marks]*
- (b) State the age of the oceanic crust at C shown on the map. *[2 marks]*
- (c) Using an annotated diagram **only**, explain why the age of oceanic crust changes with distance from the mid-ocean ridges. *[6 marks]*
- (d) Referring to specific nations, discuss the geopolitical issues that arise over ocean areas. *[10 marks]*

(This Optional Theme continues on the following page)

(Optional Theme B continued)

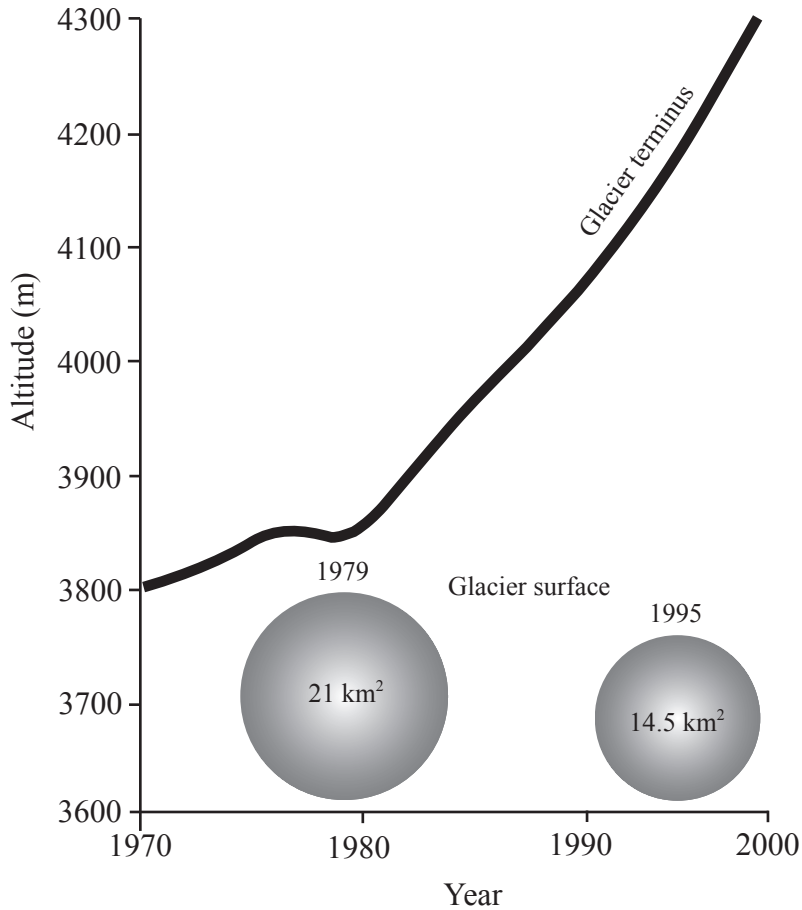
4. *If you choose to answer this question refer to the map on page 3 in the Resources Booklet.*

The map shows the estimated threat to coral reefs in South-East Asia.

- (a) Describe the pattern of threat to coral reefs shown on the map of South-East Asia. *[4 marks]*
- (b) Explain **three** socio-economic impacts of the loss of coral reefs and mangrove systems. *[6 marks]*
- (c) Using a case study, evaluate the management strategies adopted to resolve the pressures on a particular coastline. *[10 marks]*

Optional Theme C — Extreme environments

5. The graph below shows the retreat (by altitude) and the surface area of the Santa Rosa glacier in Peru.



[Source: Peru National Communication to the UNFCCC2001]

- (a) Referring to the graph, describe the changes in the terminus of the Santa Rosa glacier from 1970 – 2000. *[4 marks]*

- (b) Explain the processes involved in the advance and retreat of glaciers. *[6 marks]*

- (c) Discuss the main environmental problems caused by tourism in **one** extreme environment. *[10 marks]*

(This Optional Theme continues on the following page)

(Optional Theme C continued)

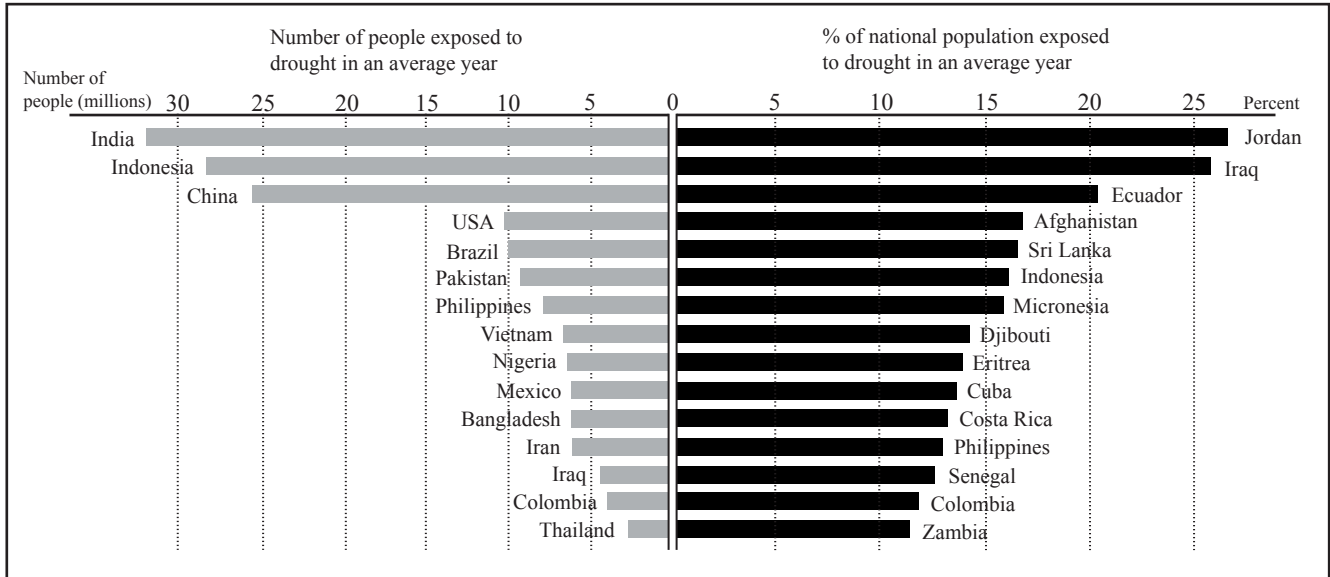
6. *If you choose to answer this question refer to the maps on pages 4 and 5 in the Resources Booklet.*

The maps show world population density and the location of hot, arid environments.

- (a) Using the two maps, describe the population density in hot, arid areas. *[4 marks]*
- (b) Explain how and why the following factors may influence population density in hot, arid areas:
- human discomfort,
 - inaccessibility. *[6 marks]*
- (c) Using examples, examine how extreme environments offer both challenges and opportunities for mineral extraction. *[10 marks]*

Optional Theme D — Hazards and disasters – risk assessment and response

7. The graph shows the number of people, and the percentage of the total population, exposed to drought in different countries in an average year.



[Source: *Reducing Disaster Risk* – UNDP/BCPR, UNEP/GRID-Geneva]

- (a) Briefly describe any **two** distinct patterns shown by the data on the graph. [2+2 marks]

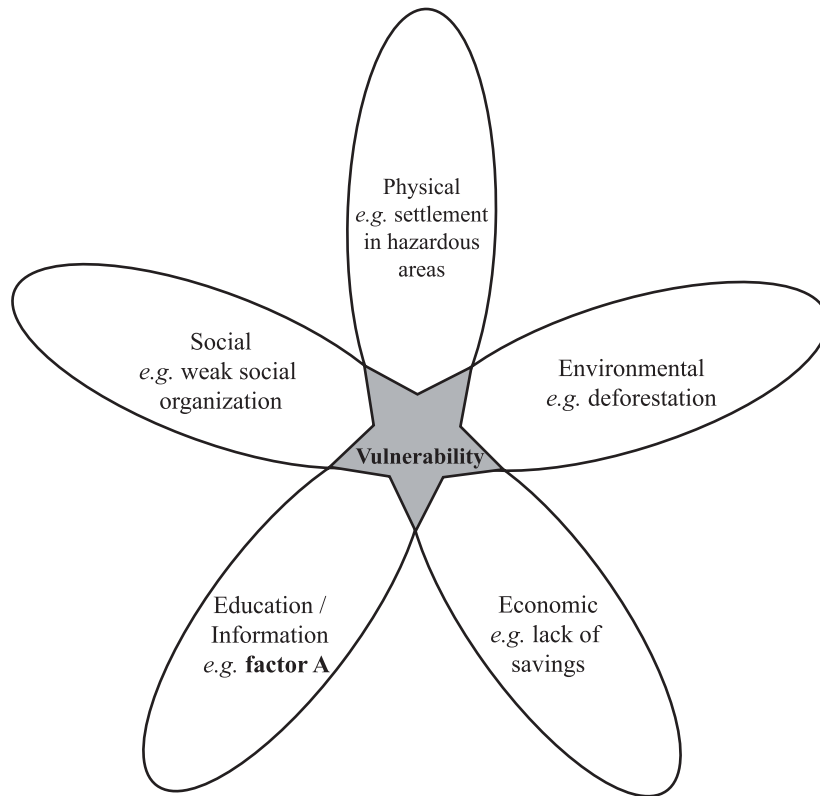
- (b) Explain the reasons for the occurrence and severity of a specific drought event that you have studied. [6 marks]

- (c) Referring to examples, examine why the geographic impacts of disasters vary in space and time. [10 marks]

(This Optional Theme continues on the following page)

(Optional Theme D continued)

8. The diagram shows some of the factors affecting vulnerability to hazards.



[Source: Richard Rhoda and Tony Burton. *Mexico: A geographic perspective*, sombrero books (2009)]

- (a) Suggest what factor A on the diagram might be. [1 mark]

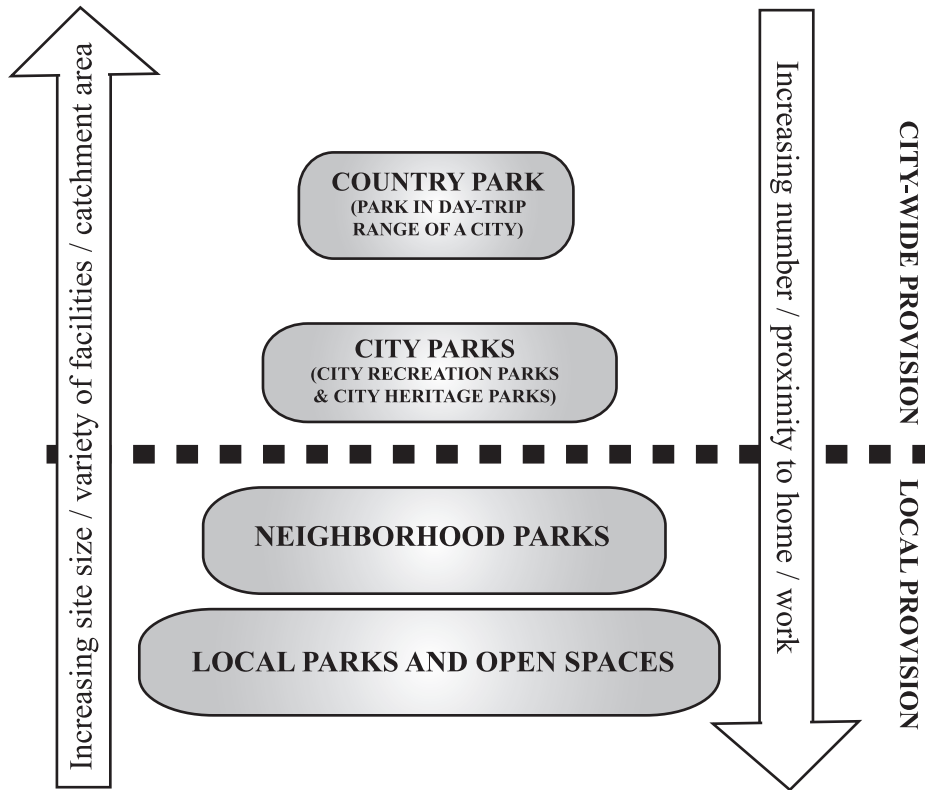
- (b) Explain how **two** of the other factors shown on the diagram affect vulnerability to hazards. [2+2 marks]

- (c) Analyse why communities may underestimate the probability of a hazard event occurring. [5 marks]

- (d) For **one or more** hazards of your choice, examine how estimates are made for the probability and likely impact of a major hazard event. [10 marks]

Optional Theme E — Leisure, sport and tourism

9. The diagram shows the hierarchy of open spaces serving a city.



[Source: Adapted from Dundee City Council, Leisure and Communities Department <http://www.dundeeccity.gov.uk/openspace/main.htm>]

- (a) Referring to the diagram, outline **two** differences you would expect to find between “local parks and open spaces” and a “country park”. *[2+2 marks]*

- (b) Explain **three** reasons why it is important for city planners to ensure that there are sufficient open spaces for urban residents. *[6 marks]*

- (c) With reference to a named urban area, examine the factors that have influenced the location and distribution of leisure facilities, other than open spaces. *[10 marks]*

(This Optional Theme continues on the following page)

(Optional Theme E continued)

- 10.** *If you choose to answer this question refer to the diagram on page 6 in the Resources Booklet.*

The graph shows the number of international tourist arrivals between 1950–2020.

- (a) State the year in which international tourist arrivals in Europe exceeded 400 million for the first time. *[1 mark]*

- (b) Describe the trend in international tourist arrivals in the East Asia / Pacific region shown on the graph. *[3 marks]*

- (c) Suggest **three** possible reasons for a decline in the total number of international arrivals in the world. *[6 marks]*

- (d) Referring to **one or more** named examples, examine why some countries have invested in tourism in order to promote development. *[10 marks]*

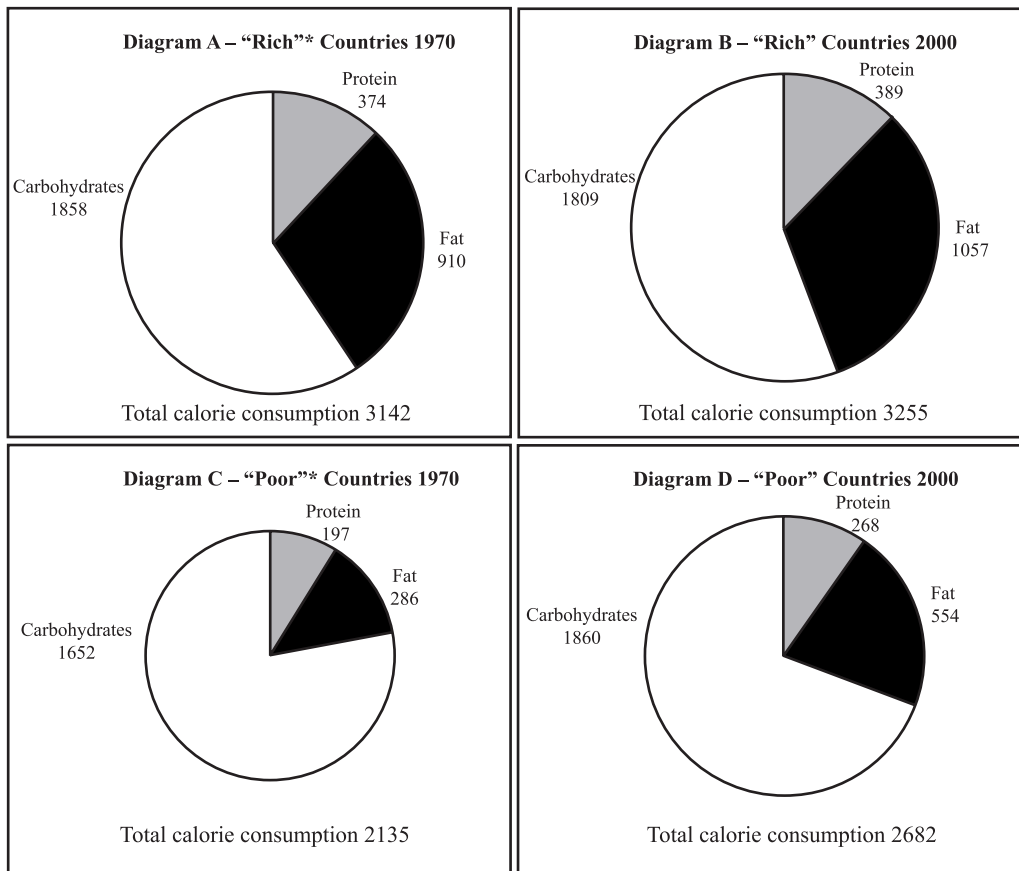
Optional Theme F — The geography of food and health

11. (a) Define the health measure HALE and explain how it differs from life expectancy. *[2+2 marks]*
- (b) Analyse the advantages and disadvantages of **two** other indices used to measure the health of populations. *[3+3 marks]*
- (c) Discuss the connections between affluence and health. *[10 marks]*

(This Optional Theme continues on the following page)

(Optional Theme F continued)

12. The diagrams show the average daily consumption of calories per person.



[Source: FAO Statistics Division]

* Rich and Poor countries according to FAO classification

- (a) Refer to the diagrams.
 - (i) Outline **two** changes in calorie consumption in poor countries from 1970 to 2000. [2 marks]
 - (ii) Outline **two** differences between calorie consumption in rich countries and poor countries in 2000. [2 marks]
- (b) Explain why food availability has increased in some areas of the world. [6 marks]
- (c) Evaluate the sustainability of modern agricultural systems. [10 marks]

Optional Theme G — Urban environments

- 13.** *If you choose to answer this question refer to the maps on pages 8 and 9 in the Resources Booklet.*

The maps show Clermont-Ferrand in France in 1979 and 2003.

- (a) (i) Define the term suburbanization. *[2 marks]*
- (ii) Referring to map evidence, briefly describe **two** processes, excluding suburbanization, that have led to the growth of Lempdes. *[2 marks]*
- (b) Referring to map evidence, suggest **three** reasons why an area of manufacturing has developed at point A (054113) on the **2003** map. *[6 marks]*
- (c) Examine the pattern of urban deprivation in a city of your choice. *[10 marks]*

- 14.** *If you choose to answer this question refer to the photograph on page 10 in the Resources Booklet.*

The photograph shows Reforma Avenue, one of the most important streets in Mexico City.

- (a) Referring to evidence in the photograph, describe **two** types of environmental stress that are likely to affect the population of Mexico City. *[2+2 marks]*
- (b) Identify **three** characteristics of Reforma Avenue that are likely to affect the urban microclimate and explain their effect. *[6 marks]*
- (c) “Cities can never be sustainable.” Discuss this statement, referring to one case study. *[10 marks]*
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**GEOGRAPHY
STANDARD LEVEL
PAPER 2**

SPECIMEN

1 hour 20 minutes

INSTRUCTIONS TO CANDIDATES

- Do not open this examination paper until instructed to do so.
- Answer two questions.
- Each question must be selected from a different optional theme, A – G.
- Do not answer two questions on the same optional theme.
- Use case studies, examples, maps and/or diagrams where relevant.

Note: The front cover and internal rubric are reproduced here for information. Please note that the questions used for standard level paper 2 and higher level paper 2 are identical.

Answer two questions. Each question must be selected from a different optional theme. (Do not answer two questions on the same optional theme.)

Wherever possible, answers should include case studies and examples, and where relevant, large, well drawn maps and diagrams.



**GEOGRAPHY
HIGHER LEVEL AND STANDARD LEVEL
PAPER 2 – RESOURCES BOOKLET**

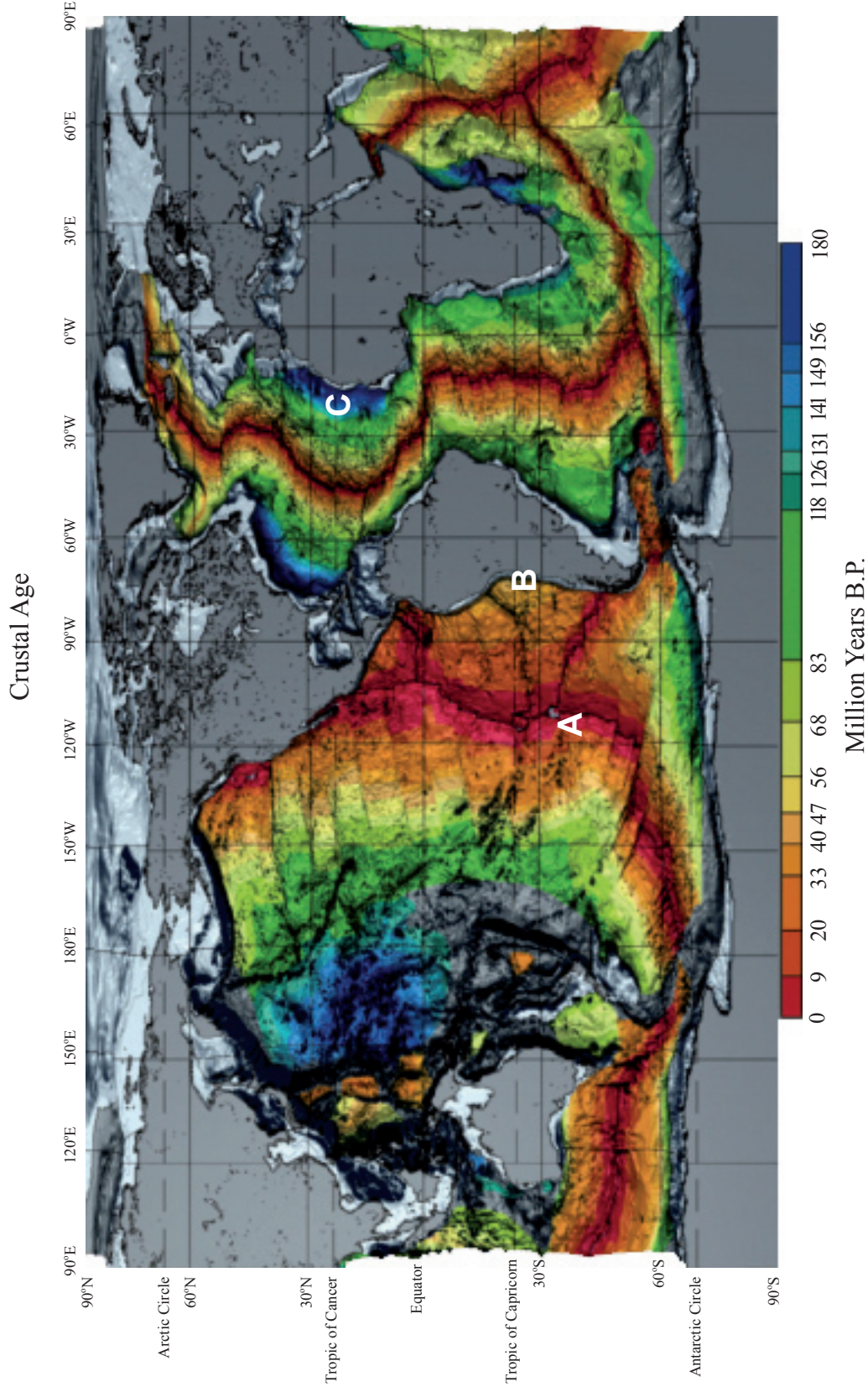
SPECIMEN

INSTRUCTIONS TO CANDIDATES

- Do not open this resources booklet until instructed to do so.
- Use the resources as appropriate to the questions in paper 2.

Optional Theme B — Oceans and their coastal margins

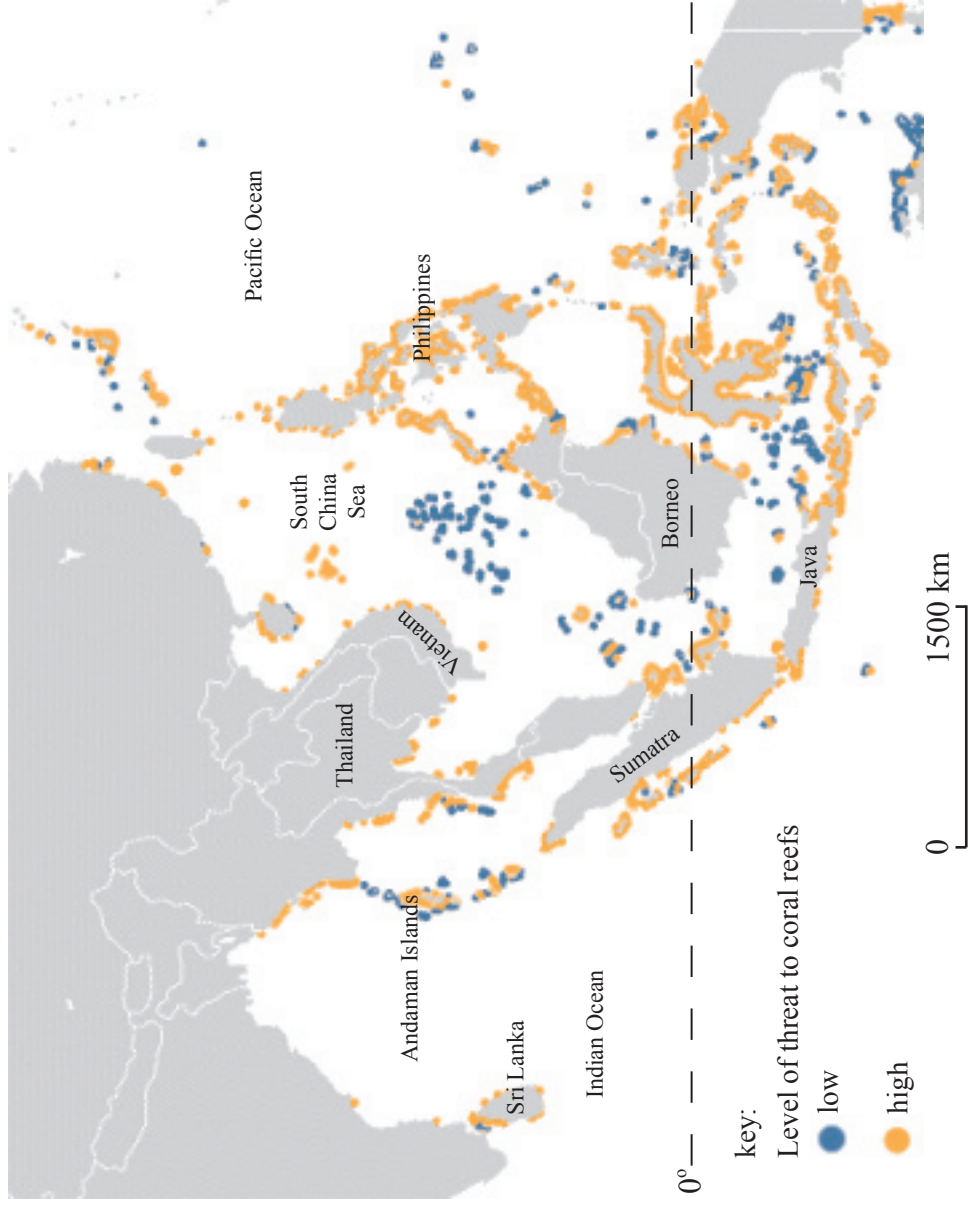
- The map shows the age of oceanic crust.



[Source: Computerized digital images and associated databases from the National Geophysical Data Centre, National Oceanic and Atmospheric Administration, U.S. Department of Commerce]

Optional Theme B — Oceans and their coastal margins

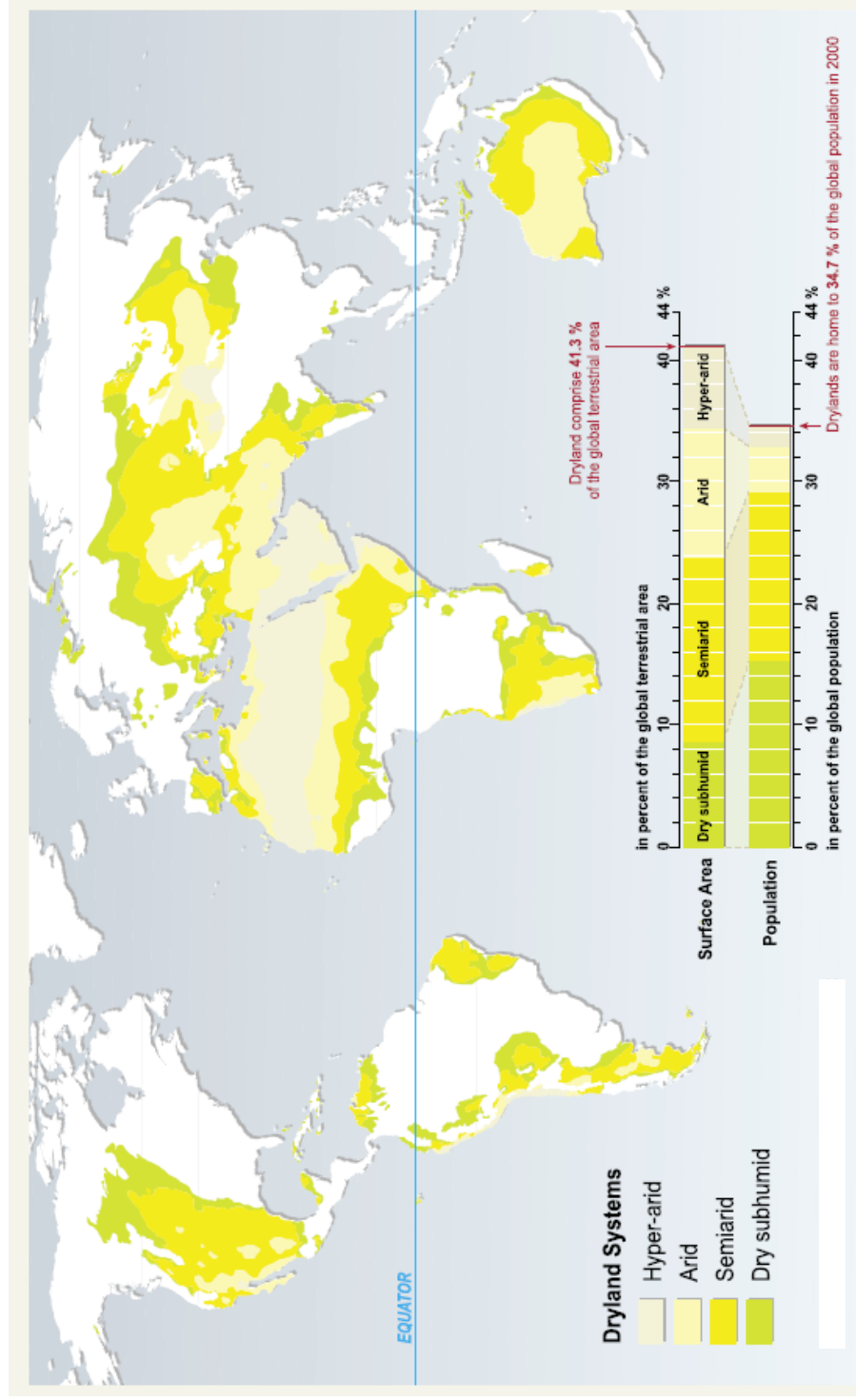
- 4. The map shows the estimated threat to coral reefs in South-East Asia.



[Source: modified from the United Nations Environment Programme's Global Environment Outlook 2000 publication <http://www.unep.org/geo2000/english/i86a.htm>]

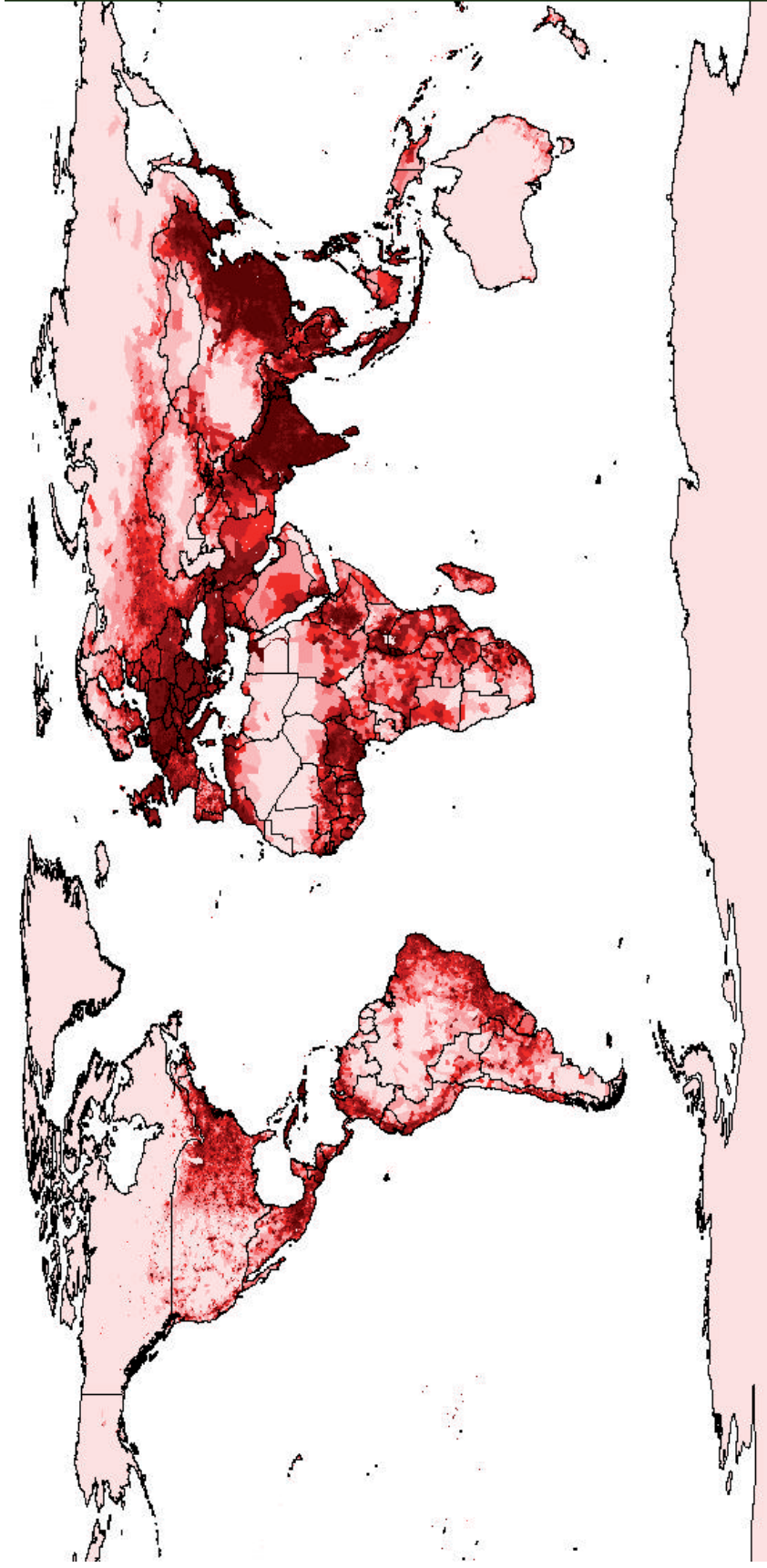
Optional Theme C — Extreme environments

6. The maps show world population density and the location of hot, arid environments.



[Source: Millennium Ecosystem Assessment]

Global Population Density

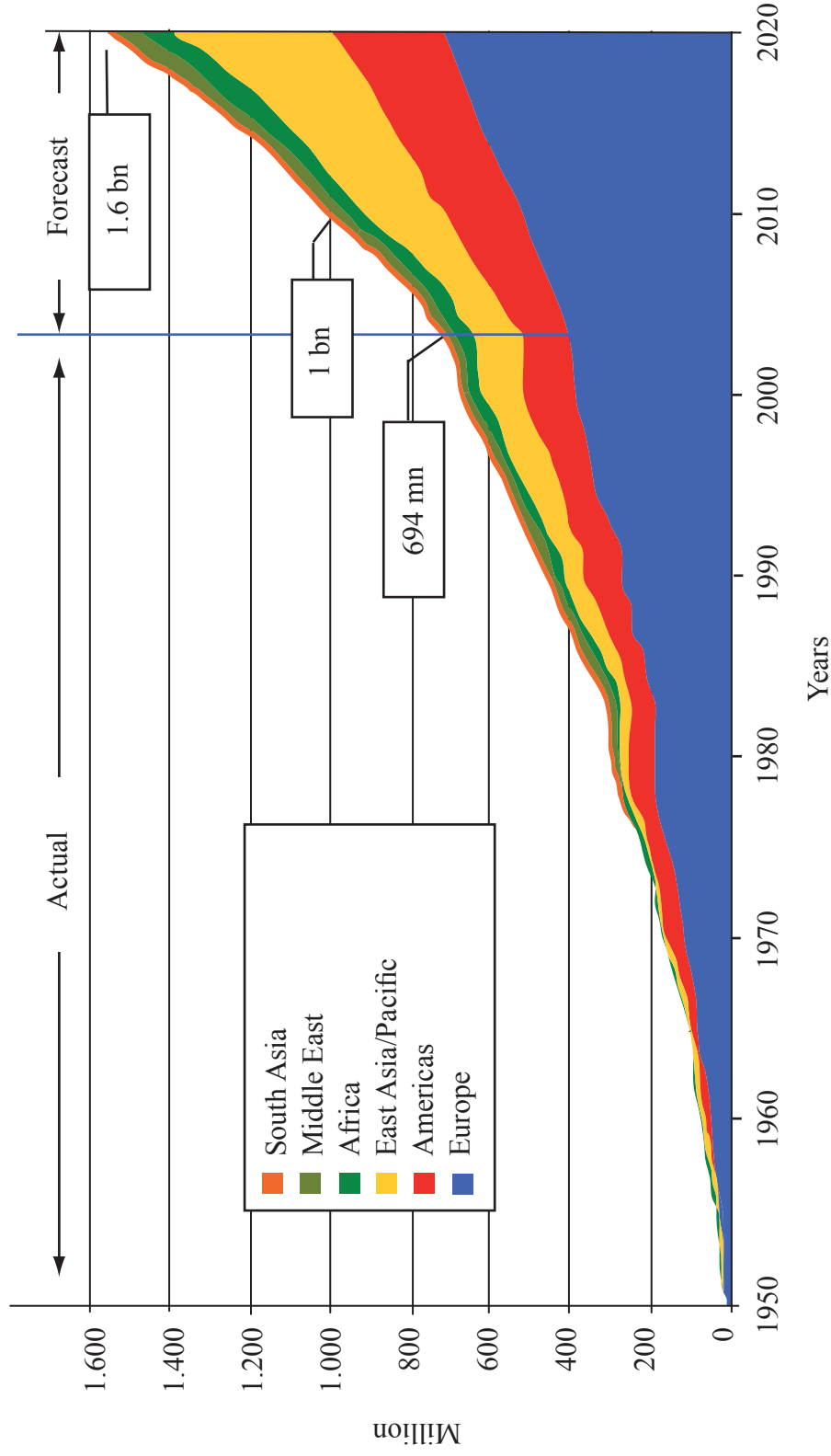


Map Projection: Geographic
Citation: WRI, 2000 based on CIESIN 2000
Notes:

[Source: ©Earth Trends 2001 World Resources Institute]

Optional Theme E — Leisure, sport and tourism

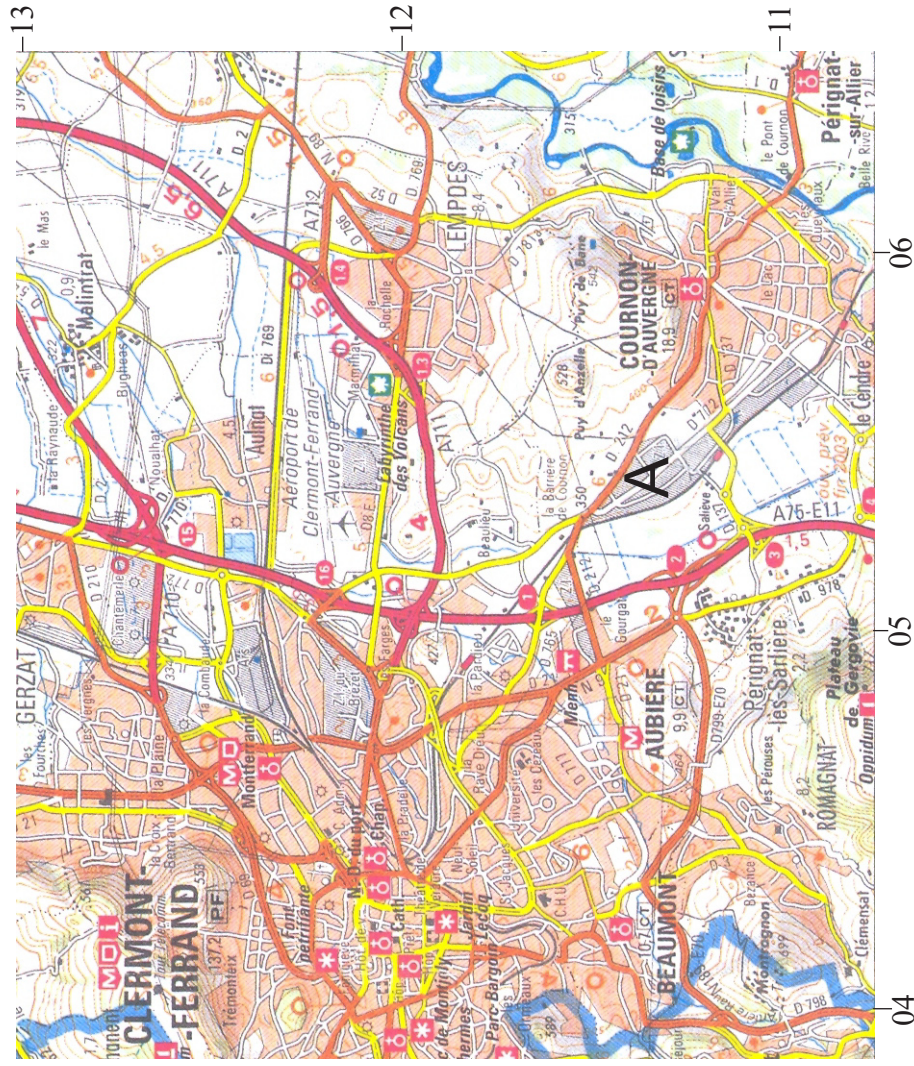
10. The graph shows the number of international tourist arrivals between 1950–2020.



[Source: ©UNWTO, 9284404708]

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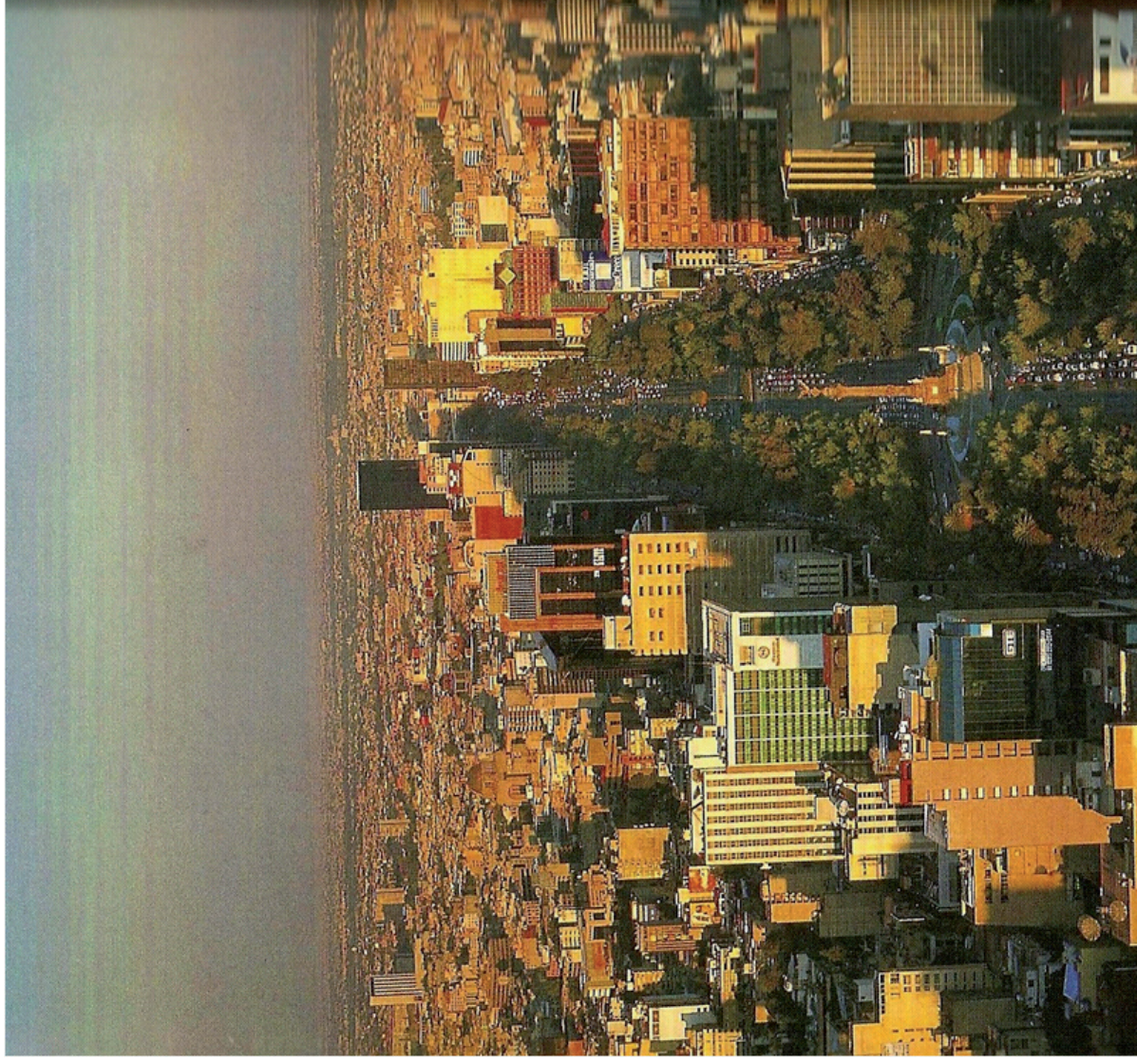
Map 2: In 2003



[Source: Extract from a map of Clermont-Ferrand produced by IGN (2003)]

Optional Theme G — Urban environments

14. The photograph shows Reforma Avenue, one of the most important streets in Mexico City.



[Source: Calderwood, M. In Cities and Society. Marsilio, 2006]



MARKSCHEME

Specimen

GEOGRAPHY

Higher Level and Standard Level

Paper 2

Optional Theme A — Freshwater – issues and conflicts

1. (a) (i) **State the year when the highest sediment load occurred.** [1 mark]

1958 [1 mark].

- (ii) **State the volume of sediment load in that year at Huangzhang.** [1 mark]

Accept answers from 3.7 – 3.8 kg/m³ inclusive. Units are required [1 mark].

- (b) **Identify *three* ways in which the load of a river is transported and briefly describe *one* of these ways.** [3 marks]

Answers are likely to be solution; suspension; bed load (though it is equally acceptable for candidates to identify more than one type of bed load movement). Award [1 mark] for two correct ways, [2 marks] for three correct ways, with the remaining [1 mark] reserved for an appropriate description of one of the ways.

- (c) **Referring to the map and graphs, explain how the construction of the Danjiangkou Dam affected sediment loads along the Han River.** [5 marks]

Candidates are expected to describe that, following construction of the dam, sediment load decreased [1 mark] and that sediment flows became less variable [1 mark]. A third [1 mark] should be awarded for any recognition that either sediment load or the variability of sediment load diminished more at sites close to the dam than further downstream. The final [2 marks] should be reserved for statements explaining these trends or patterns by reference, for example, to the reduction in peak water flows following dam construction, or to the impact of the dam acting as a sediment trap.

Other valid statements can be credited.

- (d) **Examine the influences of physical factors and human activity on a specific river flood.** [10 marks]

Both physical factors (such as the size and shape of the drainage basin; the amount and intensity of precipitation) and human activity (such as land clearance, location of housing, dam construction, flood defences) play a part in river floods, though the balance between the two will vary, depending on the specific river flood chosen.

Answers that examine a specific river flood are likely to be credited at band D and above.

It is not necessary for physical factors and human activity to be treated equally. Answers considering both aspects of the question in some detail are likely to be credited at bands E/F.

It is expected that responses will examine one specific river flood, which can be at any scale.

Marks should be allocated according to the markbands.

2. (a) **Describe the trend in water shortage between 1990 and 2015 shown on the graph.** [2 marks]

Water shortage is increasing [1 mark], but at a decreased rate since 2000 [1 mark]. For full marks some quantification is required.

- (b) **Suggest possible reasons for the changes in supply between 1990 and 2015 shown on the diagram.** [2 marks]

Possible reasons include the increased abstraction of ground water as a result of new wells, increased water from storages such as reservoirs, and from desalination plants. The suggestion that the increased supply comes from increased precipitation is not acceptable, since it would not result in such a uniform trend over the time period. Award [1 mark] each for two valid reasons.

- (c) **Analyse two competing demands for water in a named river basin.** [6 marks]

Competition for water is intense in many river basins. It is expected that candidates will analyse two broad categories of demand (such as residential, industrial, agricultural) and not two highly specific demands; the latter approach is likely to prove self-penalizing in the context of this question. Award [1 mark] for the clear identification of two competing demands and [1 mark] for the identification of a specific river basin. The remaining [4 marks] should be reserved for the analysis of the competing demands. It is not necessary for the analysis of the two demands to be equal, but the response must make some points of comparison or contrast in order to be awarded [4 marks].

- (d) **Referring to one or more examples, examine the environmental effects of ground water abstraction and irrigation.** [10 marks]

There are numerous environmental effects associated with ground water abstraction and irrigation. Ground water abstraction may lead to falling water tables, salt-water incursions if close to the coast, and, in extreme cases, subsidence of the ground surface. The effects of irrigation may include salinization, agro-chemical runoff, ground water pollution and the increased likelihood of the eutrophication of lakes, rivers and wetlands. Other valid ideas should also be credited. Candidates are expected to examine a variety of effects and both positive and negative effects are equally acceptable.

It is not necessary for ground water abstraction and irrigation to be treated equally. Answers considering both aspects of the question in some detail are likely to be credited at bands E/F.

Answers that use an appropriate example or examples are likely to be credited at band D and above.

Marks should be allocated according to the markbands.

Optional Theme B — Oceans and their coastal margins

3. (a) Referring to the map, identify the type of plate boundary shown on the map at:

(i) A,

(ii) B.

[2 marks]

The boundary type at A is constructive or divergent [1 mark] and at B is destructive or convergent (accept subduction but do not accept collision zone) [1 mark].

(b) State the age of the oceanic crust at C shown on the map.

[2 marks]

The age of the crust at C is between 141.9 and 156.8 [1 mark] million years BP [1 mark]. Any number within the range is acceptable; only answers within this range can gain the second mark.

(c) Using an annotated diagram *only*, explain why the age of oceanic crust changes with distance from the mid-ocean ridges.

[6 marks]

Candidates **must** use an annotated diagram to answer this question. No credit should be given for any information that is written separately below the map unless it is clearly related to it by means of arrows or a key. As a general rule [3 marks] should be awarded for the quality and appropriateness of the diagram and [3 marks] for the quality of the annotations. This balance can be adjusted if exceptional quality is found in either of these two parts. In good answers the annotations should include new crust being created at constructive plate boundaries which moves away from the boundaries as part of the process of sea-floor spreading. With distance the age of crust increases as a result of this divergent process.

(d) Referring to specific nations, discuss the geopolitical issues that arise over ocean areas.

[10 marks]

As populations and resource demand increase, and standards of living increase, more pressure is placed on peripheries and boundary zones and the ownership of them. There are many areas of the world where issues arise as a result of oceanic territorial disputes. These issues may be a product of sovereignty rights, resource need, military advantage, historical situation or any other valid reason. In some cases this may disadvantage nations who are not allied to a particular group or are members of an economic agreement and this may serve to impoverish nations or create tension. Responses that are discursive are likely to be credited at bands E/F.

Marks should be allocated according to the markbands.

4. (a) **Describe the pattern of threat to coral reefs shown on the map of South-East Asia.** [4 marks]

The greatest threats appear to be clustered around the larger islands/landmasses, for example around the coast of the Philippines or the main islands of Indonesia [2 marks].

Lesser threats are found in more isolated areas. Areas which may be selected include the Andaman Islands, the island chains to the east of Vietnam and those further to the east of the Philippines in the Pacific Ocean [2 marks].

Some overview as opposed to a list to describe the general pattern is required for full marks.

- (b) **Explain three socio-economic impacts of the loss of coral reefs and mangrove systems.** [6 marks]

The impacts may include a reduction of fish stocks resulting from a loss of biodiversity, a demise in tourism due to the destruction of reefs, a reduction in seafood stocks, and an increase in the vulnerability of coastal populations to inundation resulting from a loss of mangroves. Both coral reefs and mangroves protect coastal areas against erosion and their removal or degradation may impact on beaches and low-lying farmland. Mangroves, if managed sustainably, provide a valuable source of hardwood and charcoal. It is often poorer communities which exploit both the mangrove and coral reef ecosystems and the socio-economic impact is felt most by these more vulnerable groups. Other valid socio-economic impacts should be accepted. Award [2 marks] for each valid impact, provided it is developed.

- (c) **Using a case study, evaluate the management strategies adopted to resolve the pressures on a particular coastline.** [10 marks]

A wide variety of examples may be chosen and strategies may range from those which protect coastlines from erosion, to marine parks/reserves or implementing policies to manage retreat. The strategies may involve hard or soft management or revitalizing coral reefs or mangroves using innovative techniques. Whatever case study is chosen, the pressures must be clearly stated, together with the strategies adopted in response to these pressures. Responses including explicit evaluation of appropriate management strategies on a particular coastline are likely to be credited at bands E/F. Responses which fail to refer to a specific case study will be self limiting and may only achieve a maximum of band D.

Marks should be allocated according to the markbands.

Optional Theme C — Extreme environments

5. (a) **Referring to the graph, describe the changes in the terminus of the Santa Rosa glacier from 1970 – 2000.** **[4 marks]**

The glacier has been retreating over this time period **[1 mark]**. The rate of retreat has become increasingly rapid **[1 mark]** and there is an anomaly (1977 to 1979) which shows an expansion of the glacier **[1 mark]**. Award **[1 mark]** for supporting quantification.

- (b) **Explain the processes involved in the advance and retreat of glaciers.** **[6 marks]**

Advance: When inputs such as snow and avalanches in the accumulation zone are greater than the rate of melting in the zone of ablation **[3 marks]**.

Retreat: When inputs such as snow and avalanches in the zone of accumulation are less than the rate of melting **[3 marks]**.

The balance of marks between advance and retreat may be varied slightly at examiner discretion in the event of responses which explain either advance or retreat in more detail. For example, some responses may consider seasonal effects or climatic change.

It is acceptable for annotated diagrams to be used instead of text.

- (c) **Discuss the main environmental problems caused by tourism in *one* extreme environment.** **[10 marks]**

The problems associated with tourism may include impact on mass movement and erosion; land degradation; loss of biodiversity, increased vulnerability to hazards; aesthetic change; water usage, pollution and waste disposal. The discussion may refer to seasonal increases in population, with increasing demand on services and expansion of settlements.

Depending on the environment chosen, only some of these problems may be relevant.

Responses which discuss a limited number of problems in depth may be awarded full marks, as may responses which discuss a wider range of problems in less depth.

Marks should be allocated according to the markbands.

6. (a) Using the two maps, describe the population density in hot, arid areas. [4 marks]

Generally hot, arid areas have a low population density [1 mark]. The lowest population densities are found in the largest hot, arid areas such as central Sahara and central Australia [1 mark]. The highest population densities in hot, arid regions are found in coastal regions [1 mark] or in close proximity to major rivers [1 mark].

- (b) Explain how and why the following factors may influence population density in hot, arid areas: [6 marks]

Human discomfort: This could be related to a number of possibilities including lack of water (for drinking, washing and production of food), extreme temperatures, wind, exposure [3 marks].

Inaccessibility: Difficulty to access services such as medical and educational facilities, transport and communications. Hard to import and export goods resulting in low employment opportunities [3 marks].

Other relevant reasons should also be credited.

- (c) Using examples, examine how extreme environments offer both challenges and opportunities for mineral extraction. [10 marks]

There are a wide variety of answers possible, depending on the mineral resources examined. The opportunities and resulting benefits may be at a local, national or international scale. There may be economic, social and political benefits to mineral extraction. The opportunities and challenges may be influenced by market forces, demand, competition, existing technology and probable future innovations. Challenges include overcoming inaccessibility, environmental restrictions, the investment required, human discomfort, fluctuations in economic and political conditions.

The breadth or depth of treatment of challenges and opportunities need not be equal. Examples are a specific requirement of the question and are required to access band D and above.

Marks should be allocated according to the markbands.

Optional Theme D — Hazards and disasters – risk assessment and response

7. (a) **Briefly describe any *two* distinct patterns shown by the data on the graph.** [2+2 marks]

For each pattern, award [2 marks] for its brief description, including quantification. The graph reveals several patterns. The number of people exposed to drought in an average year tends to be higher in more populous countries such as India, Indonesia and China. The countries where the highest percentages of national population are exposed to drought in any given year tend to be relatively small in both population and in area, though Indonesia is a clear exception. Any two distinct valid patterns should be credited.

- (b) **Explain the reasons for the occurrence and severity of a specific drought event that you have studied.** [6 marks]

Award [1 mark] for the identification of when and where a specific drought event occurred and a further [1 mark] for a description of its severity. The remaining [4 marks] should be reserved for the explanation of why the event occurred and for its severity. For [4 marks] both must be explained, though it is not necessary for both to be explained in equal detail.

Responses that do not focus on a specific drought event may not be awarded more than [3 marks].

- (c) **Referring to examples, examine why the geographic impacts of disasters vary in space and time.** [10 marks]

There are many factors explaining why the impacts of disasters vary in space and time, and candidates are expected to include a variety of ideas in their answers.

The impacts of disasters depend on the type of hazard event leading to the disaster. For example, a drought has very different impacts, in both time and space, to a volcanic eruption. The impacts of disasters are not only determined by the characteristics of the hazard event, but also by the characteristics of the population and economic activity in the area concerned. The vulnerability of the population varies spatially, and with time. Impacts will be reduced if well-rehearsed response plans work effectively. Conversely, impacts may be increased if the first signs of an upcoming disaster are ignored. For a disaster of any given magnitude, it is often argued that more lives may be lost, but that the value of property damage will be less, in economically less developed nations than in more developed nations. Other valid ideas should also be credited.

It is not necessary for variations in space and time to be treated equally. Answers examining both aspects of the question in some detail are likely to be credited at bands E/F.

Examples are a specific requirement of the question and are required to access band D and above.

Marks should be allocated according to the markbands.

8. (a) **Suggest what factor A on the diagram might be.** [1 mark]

Factor A might be earthquake drills in schools, or presence/absence of early warning systems. Award [1 mark] for any valid suggestion, which must be related to education/information.

- (b) **Explain how two of the other factors shown on the diagram affect vulnerability to hazards.** [2+2 marks]

Award [2 marks] for each explanation, which must be related to the concept of vulnerability, and not, for instance, to the severity of the hazard itself.

- (c) **Analyse why communities may underestimate the probability of a hazard event occurring.** [5 marks]

Underestimating the probability of a hazard event occurring may stem from many causes including a community's misplaced optimism, having insufficient evidence available for a more accurate assessment, and an unrealistic belief that "it can't happen (again) here". Award [1 mark] each for these or other valid statements, and a further [1 mark] for each subsequent development of any point, up to the maximum of [5 marks].

- (d) **For one or more hazards of your choice, examine how estimates are made for the probability and likely impact of a major hazard event.** [10 marks]

There are many techniques used in risk assessment. They include the identification of trends and patterns, based on previous events. An example of the former would be working out the return intervals for major hurricanes; an example of the latter would be using gap theory to predict the location of the next major earthquake along a plate boundary. If the historical record is long enough, it is possible to calculate the probability of an event of any particular magnitude occurring with some degree of reliability. Assessing the likely impact of a major hazard event depends on the spatial analysis of the vulnerability of the population (lives and property). This may involve the use of GIS to identify areas where, for instance, housing types are less resilient to earthquakes, or where families cannot afford insurance against a specific hazard and have no financial reserves to recover quickly if a hazard event occurs.

Depending on the hazard event examined, there are numerous possible approaches to this question, but answers considering both aspects of the question (probability and likely impact) in some detail are likely to be credited at bands E/F. It is not necessary for the two aspects to be treated in equal detail.

A specific hazard event is a specific requirement of the question; it is expected in those answers achieving band D and above.

Marks should be allocated according to the markbands.

Optional Theme E — Leisure, sport and tourism

9. (a) Referring to the diagram, outline *two* differences you would expect to find between “local parks and open spaces” and a “country park”. *[2+2 marks]*

Candidates would have to state the differences of the two locations in terms of:

- size
- range of facilities available
- number
- origin of visitors / catchment area size.

[2+2 marks] for each valid difference outlined.

- (b) Explain *three* reasons why it is important for city planners to ensure that there are sufficient open spaces for urban residents. *[6 marks]*

Candidates are expected to identify three reasons for *[2 marks]* each.

Reasons for open spaces include:

- escape from urban stress
- moderation of urban microclimates
- individual and community health benefits
- development of sports teams and social integration and co-operation
- ecological understanding and sustainability
- preserve natural and urban heritage (museums/religious sites/woodland)
- prevent user conflict in urban areas (skateboarders/football/cycling).

Accept other valid reasons.

- (c) With reference to a named urban area, examine the factors that have influenced the location and distribution of leisure facilities, other than open spaces. *[10 marks]*

Responses are expected to identify the balance between demand for, and supply of, leisure facilities in urban areas and refer to factors that would influence their location. This might include government planning and policy, market influences, changing leisure habits, land use changes and land value changes. Examples should be specific and illustrate knowledge of the specific conditions in the chosen location rather than general trends. A specific, named example is a requirement of the question and is expected in those achieving band D and above.

Marks should be allocated according to the markbands.

10. (a) **State the year in which international tourist arrivals in Europe exceeded 400 million for the first time.** [1 mark]

Award [1 mark] for any year between 2002–2006 inclusive.

- (b) **Describe the trend in international tourist arrivals in the East Asia / Pacific region shown on the graph.** [3 marks]

Tourism to the East Asia / Pacific region has risen rapidly and is expected to continue rising [1 mark]. Award [1 mark] for either the date tourism began (about 1970) or for noting any fluctuation in the trend. Award [1 mark] for any quantification.

- (c) **Suggest three possible reasons for a decline in the total number of international tourist arrivals in the world.** [6 marks]

Award [2 marks] each for identification of three reasons.

Possible answers include:

- political instability
- relative cost of travel (such as fuel)
- world recession
- pandemics
- terrorism.

Accept other valid reasons.

- (d) **Referring to one or more named examples, examine why some countries have invested in tourism in order to promote development.** [10 marks]

Candidates would be expected to identify the potential benefits of tourism for either LEDCs or MEDCs, or both. Answers might show an understanding of the growth of the global tourist industry in the last 50 years and the opportunities this presents for economic development. More specifically, an explanation might cover increased access to foreign capital (and its importance in the global economy), development of infrastructure, employment opportunities, reduction of poverty, exploiting cultural and heritage tourism opportunities, and consequent multiplier effect, potential training, transfer of skills and exposure to foreign management methods. Candidates are expected to show an understanding of the role of tourism in the promotion of economic development and as such could make reference to potential impacts on relevant development indicators. At least one named example is a requirement and is expected in those answers accessing band D or above.

Marks should be allocated according to the markbands.

Optional Theme F — The geography of food and health

- 11. (a) Define the health measure HALE and explain how it differs from life expectancy. [2+2 marks]**

HALE (health-adjusted life expectancy) is based on current rates of life expectancy at birth [*1 mark*], but includes an adjustment for time spent in poor health (due to disease and/or injury) [*1 mark*].

It differs from life expectancy which estimates the number of years a person is likely to live, usually from birth [*1 mark*] according to current age-specific mortality rates [*1 mark*]. There may be alternative valid points which should be credited.

- (b) Analyse the advantages and disadvantages of two other indices used to measure the health of populations. [3+3 marks]**

Suitable indices include infant mortality rate, child mortality rate, calorie intake, access to safe water and to health services. There are other possibilities. Award [*1 mark*] for each measurable health-related index, a further [*1 mark*] for a valid advantage and [*1 mark*] for a valid disadvantage of each one.

- (c) Discuss the connections between affluence and health. [10 marks]**

The interpretation of affluence ranges from a comfortable standard of living to one that involves high levels of resource consumption. It is expected that candidates will recognize the ways in which affluence may promote good health by providing sufficient funds to live comfortably, which may minimise stress and provide access to social and health services. Responses accessing bands E and F should recognize the negative side of affluence where excessive food consumption and sedentary life style may lead to obesity and degenerative diseases. Although unspecified in the question, answers that offer examples and case studies to illustrate their answer are likely to be credited at band D or above.

Marks should be allocated according to the markbands.

12. (a) Refer to the diagrams.

- (i) Outline *two* changes in calorie consumption in poor countries from 1970 to 2000.**

[2 marks]

The diagrams show that total calorie consumption has increased *[1 mark]* and in particular more calories are derived from fats and protein, fewer calories from carbohydrates *[1 mark]*. Accept other valid changes. Some quantification is required for full marks.

- (ii) Outline *two* differences between calorie consumption in rich countries and poor countries in 2000.**

[2 marks]

Total calorie consumption of rich countries is greater *[1 mark]* and carbohydrate consumption in poor countries is greater than in rich countries *[1 mark]*. Accept other valid changes. Some quantification is required for full marks.

- (b) Explain why food availability has increased in some areas of the world.**

[6 marks]

Food availability is dependent upon supplies from domestic production, commercial imports and donors. Food is available if it is in easy reach of consumers and this depends upon access as well as yield. The availability of food has been enhanced through technological progress and increasing agricultural knowledge, both of which have boosted production. Favourable taxing and tariff policies, trading and efficient transport systems have also allowed the effective movement of food from source to point consumption. Answers which focus only upon food production should be awarded a maximum of *[3 marks]*.

- (c) Evaluate the sustainability of modern agricultural systems.**

[10 marks]

Most modern agriculture systems are designed to maximise production through economies of scale, the use of technology and agribusiness. These changes have increased yields, but often at an environmental and social cost. Environmental problems may include soil contamination, soil degradation, eutrophication of watercourses, increased atmospheric methane, energy subsidies, inhumane practices. Associated with this have been agricultural unemployment, outward migration from rural areas and rapid urban growth. Over-exploitation of resources and environmental damage are consequences of modern agriculture, which are unsustainable. Some candidates may argue that some modern agricultural systems, including organic farming, have made agriculture more sustainable. Either approach is equally valid and can receive full marks. Answers which identify, explain and evaluate the sustainability of agricultural practices may access bands E and F.

Marks should be allocated according to the markbands.

Optional Theme G — Urban environments

- 13. (a) (i) Define the term suburbanization. [2 marks]**

Suburbanization is the process of outward growth of towns and cities [1 mark] to engulf surrounding villages and rural areas [1 mark].

- (ii) Referring to map evidence, briefly describe two processes, excluding suburbanization, that have led to the growth of Lempdes. [2 marks]**

Towns such as Lempdes show considerable growth. Possible processes include migration, counter-urbanization, natural increase, decentralization, urban sprawl. Award [1 mark] for each correct answer.

- (b) Referring to map evidence, suggest three reasons why an area of manufacturing has developed at point A (054113) on the 2003 map. [6 marks]**

Several factors may have been responsible for an area of manufacturing developing in this zone. Evidence from the map should be given to support statements made. The advantages of site A include access to the airport and autoroute for deliveries and distribution, relatively cheap land, flat land for easy building construction and nearby labour pools in Cournon and Clermont-Ferrand. Award [2 marks] for each of three reasons.

- (c) Examine the pattern of urban deprivation in a city of your choice. [10 marks]**

Deprivation should be defined and its pattern examined. A well-drawn annotated map may substitute for text. The pattern must be clearly described. The factors influencing the pattern will depend on the case study chosen. Likely factors might include residence choices made by affluent members of the city population, topography, climate, prevailing winds, accessibility, communication lines, government policy (zoning), family and ethnic ties, and location of twilight zones. Other valid reasons or approaches may be equally acceptable.

Marks should be allocated according to the markbands.

14. (a) Referring to evidence in the photograph, describe *two* types of environmental stress that are likely to affect the population of Mexico City. [2+2 marks]

There are a number of possibilities, including air pollution, visible as an atmospheric haze creating poor visibility in the distance, vehicle noise and congestion.

- (b) Identify *three* characteristics of Reforma Avenue that are likely to affect the urban microclimate and explain their effect. [6 marks]

A narrow sky view area restricts sunshine, a high density of buildings retains heat, tall buildings reduce general wind speed, but may focus winds, producing a canyon effect with higher wind gusts. The characteristics must be visible in the photo; a general explanation of the urban heat island is not acceptable.

- (c) "Cities can never be sustainable." Discuss this statement referring to one case study. [10 marks]

Candidates may choose to either agree or disagree with the question, but stronger answers accessing bands E and F must address both sides of the argument. A good answer accessing band D and above must have case study support and is likely to refer not only to environmental, but also to social and/or economic aspects of management or mismanagement.

- Environment: resource conservation, waste management, transport.
- Social: housing, educational opportunities, political freedoms and equal opportunities, and local involvement in decision-making.
- Economic: income security and employment diversity.

Marks should be allocated according to the markbands.

Command terms with definitions and examples

Students should be familiar with the following key terms and phrases used in examination questions, which are to be understood as described below. Although these terms will be used frequently in examination questions, other terms may be used to direct students to present an argument in a specific way.

The assessment objectives (AOs) listed in the table are those referred to in the geography syllabus.

Command term	Assessment objective	Definition	Elaboration and exemplification
Analyse	AO2	Break down in order to bring out the essential elements or structure.	<i>Analyse the pattern of poverty within a city.</i>
Annotate	AO4	Add brief notes to a diagram or graph.	<i>Draw an annotated diagram to show the land-use patterns in an urban area.</i>
Classify	AO2	Arrange or order by class or category.	<i>Classify these resources into renewable and non-renewable.</i>
Compare	AO3	Give an account of the similarities between two (or more) items or situations, referring to both (all) of them throughout.	<i>Compare the predictability of earthquakes and volcanoes.</i>
Compare and contrast	AO3	Give an account of similarities and differences between two (or more) items or situations, referring to both (all) of them throughout.	<i>Compare and contrast the leisure facilities in different sized cities.</i>
Construct	AO4	Display information in a diagrammatic or logical form.	<i>Construct a population pyramid to illustrate the data in the table.</i>
Contrast	AO3	Give an account of the differences between two (or more) items or situations, referring to both (all) of them throughout.	<i>Contrast the effectiveness of anti-natalist and pro-natalist policies.</i>
Define	AO1	Give the precise meaning of a word, phrase, concept or physical quantity.	<i>Define the ecological footprint.</i>

Describe	AO1	Give a detailed account.	Give a detailed picture/account of a given situation, event, pattern, trend, process or feature. <i>Describe the trend shown on the graph.</i> <i>Describe the fluvial landforms shown on the map.</i>
Determine	AO1	Obtain the only possible answer.	<i>Determine the edge of the Central Business District (CBD) shown on the map.</i>
Discuss	AO3	Offer a considered and balanced review that includes a range of arguments, factors or hypotheses. Opinions or conclusions should be presented clearly and supported by appropriate evidence.	<i>"Volcanoes are more hazardous than earthquakes."</i> <i>Discuss this statement.</i> <i>Discuss the main environmental impacts caused by tourism in one extreme environment.</i>
Distinguish	AO2	Make clear the differences between two or more concepts or items.	<i>Distinguish between physical water scarcity and economic water scarcity.</i>
Draw	AO4	Represent by means of a labelled, accurate diagram or graph, using a pencil. A ruler (straight edge) should be used for straight lines. Diagrams should be drawn to scale. Graphs should have points correctly plotted (if appropriate) and joined in a straight line or smooth curve.	<i>Draw a map to show the urban heat island effect.</i>
Estimate	AO1	Obtain an approximate value.	<i>Estimate the sediment load shown on the graph in the year 2000.</i>
Evaluate	AO3	Make an appraisal by weighing up the strengths and limitations.	<i>Evaluate a policy implemented to provide sustainable fish yields.</i>
Examine	AO3	Consider an argument or concept in a way that uncovers the assumptions and interrelationships of the issue.	<i>Examine the consequences of the destruction of coral reefs.</i>
Explain	AO2	Give a detailed account including reasons or causes.	Describe clearly and give reasons for a concept, pattern, trend, process, relationship or idea. <i>Explain the landforms found on flood plains.</i>

Identify	AO1	Provide an answer from a number of possibilities.	<i>Identify the year in which there is an anomaly on the graph.</i>
Justify	AO3	Give valid reasons or evidence to support an answer or conclusion.	<i>Justify the position taken by anti-globalization movements.</i>
Label	AO4	Add labels to a diagram.	<i>Draw a diagram of patterned ground in a periglacial environment and label the main features.</i>
Outline	AO1	Give a brief account or summary.	<i>Outline two changes in calorie consumption shown in the graphs.</i>
State	AO1	Give a specific name, value or other brief answer without explanation or calculation.	<i>State the age of the oceanic crust shown on the map.</i>
Suggest	AO2	Propose a solution, hypothesis or other possible answer.	<i>Suggest possible reasons for the changes in water supply between 1990 and 2010 shown on the graph.</i>
To what extent	AO3	Consider the merits or otherwise of an argument or concept. Opinions and conclusions should be presented clearly and supported with empirical evidence and sound argument.	<i>To what extent has globalization resulted in homogenized landscapes?</i>