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GEOGRAPHY

Higher and Standard Level

Paper 2

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SECTION A

A1. Drainage basins and their management

Either

(a) Essay

Examine the ways in which river landforms can influence human activity. ***[20 marks]***

This is a very broad topic with a variety of possible approaches regarding the number of landforms and the number of different ways in which they influence human activity. A very good response would examine several landforms and a range of influences.

The content of the response clearly depends upon the landforms chosen, but possible approaches might review the ways in which humans utilize flood plains and deltas, the importance of natural levées, the influence of river terraces on settlement and agriculture, the use of gorges for dams, the use of river valleys for transport routes, the effects of meandering rivers on river transport, the effects of lateral erosional features on land use. But not all of these need to be included in a good answer. The scale of the landforms included may vary considerably and this is acceptable.

To move beyond band F responses must include examples as opposed to generalizations and the influence of landforms, not straying into river hazards such as flooding and the ways in which humans have tried to mitigate floods.

Marks should be allocated according to the markbands.

Or

(b) Structured question

(i) Describe how the discharge and the hydraulic radius of the streams were calculated from the data given in the table. ***[2+2 marks]***

The discharge of each stream is calculated by multiplying the area of the cross section by the mean velocity ***[1 mark]***. Reference must be made to the data in the table used to calculate this ***[1 mark]***.

The hydraulic radius is calculated by dividing the area of the cross section by the wetted perimeter ***[1 mark]***. Again, reference must be made to the data in the table used to calculate this ***[1 mark]***.

(ii) Give a reason why stream B is the most efficient. ***[1 mark]***

Stream B is the most efficient because it has the higher hydraulic radius. No other answer should be accepted.

(iii) Explain how the characteristics of a channel affect stream velocity. ***[7 marks]***

Mention should be made of the following: the bed roughness, which in turn influences the amount of friction and whether the flow is laminar or turbulent, the shape of the channel including depth/width ratio, the gradient of the bed. (No credit should be given for mention of the size of the discharge, as this is not a channel characteristic.) It should be possible to gain full marks if good explanations of the above are included.

Credit should also be given to reasons for variations in velocity across the channel and the influence of riffles and pools in relation to the maximum velocity vector.

(iv) Explain why humans modify natural river channels. ***[8 marks]***

A variety of reasons may be included in the response though a comprehensive review is not essential to a good answer. The question demands an explanation of the reasons for channel modification rather than pure description of the modifications themselves.

Explanations may include why channels are straightened, deepened, widened or confined – essentially to improve navigation or to alter the velocity of the river in flood management schemes. Other modifications such as the use of weirs to control gradients and vertical erosion, or structures to prevent lateral erosion to protect farmland, settlements or transport routes are valid. All of the above are not essential to gain full marks. The construction of flood relief channels parallel to the main channel is an acceptable modification as is the construction of dams.

It is possible that a response that looks at the reasons for two modifications in detail would be as valid as one that examines numerous reasons in more general terms. Responses that discuss only one modification should not be awarded more than ***[4 marks]***.

Responses that describe channel modification, without any explanation, should not be awarded more than ***[3 marks]***.

A2. Coasts and their management

Either

(a) Essay

Evaluate the attempts people have made to protect themselves against a specific coastal hazard. Briefly explain why people continue to live in coastal regions known to be hazardous. ***[20 marks]***

The precise nature of human responses will depend on the specific hazard chosen, but a good answer is likely to examine most of the following: insurance, monitoring, forecasting, precautions, hazard modification and evacuation plans. The level of human response will very often depend on the economic status of the coastal area concerned. It is expected that answers will refer to one specific hazard in one area, but reference to one hazard in several coastal areas would also be acceptable.

People continue to live in hazardous coastal regions for a number of reasons. These include their suitability for settlement and communications and their commercial opportunities connected with trade, industry, farming and tourism. These benefits may be perceived to outweigh the risks. People may also fail to appreciate the risk or may learn to live with it. Inertia and fatalism may also operate. In general, more people in LEDCs than in MEDCs live in hazardous coastal regions, but this is partly the result of the global distribution of hazards such as typhoons and flooding.

Any answer that does not refer to a specific coastal hazard may not move beyond the bottom of band E. The chosen hazard must be within the coastal zone and must present a danger to humans. The following would be appropriate: hurricanes, tsunamis, flooding (river flooding is only relevant if coastal processes are involved), erosion.

Any answer that fails to evaluate or answers only part of the question may not move beyond band F.

The marks should be allocated according to the markbands.

Or

(b) Structured question

(i) State *two* physical factors which would need to be considered when designing the most effective size of revetment. ***[2 marks]***

[1 mark] for each of any two relevant factors. These include wave height, tidal range, the angle of coastal slope, length of vulnerable coast, wave frequency, and wave energy.

(ii) Explain how this type of structure can prevent coastal erosion. ***[3 marks]***

Revetments prevent coastal erosion by reducing the effects of wave action ***[1 mark]***. Wave energy is absorbed by open armoured rocks ***[1 mark]***. The final ***[1 mark]*** may be awarded for any additional relevant detail.

(iii) Analyse the natural factors that cause different rates of coastal erosion. ***[8 marks]***

Relevant natural factors include differences in fetch and exposure to wave action, the lengthening of any abrasion (wave-cut) platform (which leads to a dissipation of wave energy), changes in base level, differences in rock type and structure, cliff morphology (angles, height, vegetation cover). The analysis should be focused clearly on the rate of erosion, and not other characteristics. Credit responses which mention variations in time as well as space.

(iv) Explain why some rapidly eroding coastlines are actively managed and others are not. ***[7 marks]***

The level of management is determined initially by the value of coastal land and its use. For instance, coastlines in non-populated areas may be entirely unmanaged, whereas coastlines in some urban areas may be actively managed to preserve streets, buildings and recreation areas. The degree of management is likely to depend on economic level, making intensive management more likely in MEDCs than in LEDCs. Coastlines in some national parks or other protected areas may not be actively managed depending on the prevailing conservation philosophy. Responses should consider several distinct reasons to be awarded the maximum ***[7 marks]***. Credit should be given if physical factors reappear in this question provided there is not straight repetition.

A3. Arid environments and their management

Either

(a) Essay

"Human activity in arid and semi-arid areas is affected more by strong winds than by scarcity of water."

Evaluate this statement. ***[20 marks]***

The main thrust of this question is one of evaluation based on a consideration of the impact of aeolian processes on landforms and of the ability to access water in arid areas. Responses would be expected to show a good understanding of wind action, particularly where it results in depositional features (sand dunes), and in the stripping of disturbed topsoil. The main problems posed by these features and processes concern the covering of communication links and the burying of settlements in the former case, and by soil degradation and accelerated desertification in the latter. Mention could also be made of the effect of wind in increasing the rate of evaporation in areas with limited water supplies. Against this, responses would be expected to examine the difficulty in obtaining water (drilling, damming, or importing it over great distances). The cost of meeting these challenges will vary spatially and over time and, in order to make a full and valid evaluation, some attention should be paid to these variables by making reference to examples.

Both arid and semi-arid regions should be mentioned, although more emphasis may be given to one than the other.

It is possible that some responses may adopt a different approach, such as where the emphasis is on the specific economic activity rather than on the processes and landforms involved. Such approaches should be accepted, provided they address the question and come to a valid evaluation.

The marks should be allocated according to the markbands.

Or

(b) Structured question

(i) State *two* reasons why the area shown in the photographs is described as a semi-arid region. ***[2 marks]***

Responses should comment on the sparseness of the vegetation ***[1 mark]*** and the sharp, angular land forms ***[1 mark]***.

(ii) Name the type of feature shown at X in the centre of the photographs and explain its formation. ***[4 marks]***

The central landform is a mesa ***[1 mark]***. The explanation should note that it is formed by erosion of the horizontal layers of sediments, mainly by water ***[2 marks]***. The scree accumulations result from freeze/thaw action or exfoliation ***[1 mark]***.

A well-annotated and clear diagram or set of diagrams may be awarded up to ***[3 marks]*** provided there is explanation of formation of this feature.

(iii) Suggest possible reasons for the changes in vegetation cover in the south-west USA since photograph A was taken. ***[4 marks]***

The most obvious cause is a change in management practices – while the earlier photograph reflects overgrazing by cattle, the later photograph shows the effects of a reduction in stocking levels and fire control. Alternative explanations could be offered, but responses would be expected to show an awareness of the location of the photographs in presenting possible reasons.

(iv) Referring to examples, examine the characteristics, fertility and agricultural value of soils in areas of aridity. ***[10 marks]***

Responses would be expected to note that the soils are aridisols, characterized by a thin top soil which is easily eroded, is slow forming, has a low organic content (1-2%), a high pH value, and is salt rich in areas of high evaporation where pan layers could form. All these characteristics are limiting factors and cultivation would only be possible with irrigation (increasing the danger of salinization). Potential is also limited by the liability to wind erosion once the soil has been disturbed by ploughing. While all these factors need not be examined, the responses should cover most of them, and to move beyond band F should show a clear evaluation of the agricultural potential of these soils.

Marks should be allocated according to the markbands, and if there are no examples responses may not move beyond band E.

A4. Lithospheric processes and hazards

Either

(a) Essay

Explain why there are variations in the speed of mass movements. Examine how both rapid mass movements and slow mass movements cause problems for people. ***[20 marks]***

The first part of the response demands a straightforward explanation accounting for differences in the speed of mass movements. Most of the following contributing factors should be mentioned: slope angle, rock type, rock structure, water content, depth of regolith, nature of the regolith (soil, scree), tectonic activity, rate of weathering, slope load, the rate of erosion at the base of the slope and human modification of slopes. Reference should be made to different types of mass movement to illustrate these factors, though it is not expected that responses need give a comprehensive summary of all types of mass movement as one type may be used to illustrate several factors.

The second part of the answer requires an examination of the effects of mass movements of different speeds on people in terms of loss of property and life. It is anticipated that responses will consider that slow movements such as soil creep and solifluction are not hazardous but that they do have effects on the human landscape and these should be briefly explained.

Faster movements should be examined in terms of their greater effect and responses should point out that the speed of onset and speed of movement reduces predictability and results in a larger impact. Responses should explain this with reference to types of fast movement, though again, not every type of rapid mass movement is essential to a good answer. Movements such as debris avalanches, rock falls, rock or debris slides, slumps and mudflows may be used to illustrate the relationship between speed and impact though reference to all of these is not necessary. Stronger responses will undoubtedly refer to actual examples of mass movements in order to demonstrate their impacts. Candidates who include snow avalanches as a type of rapid mass movement should be credited as long as conclusions are drawn regarding speed and impact.

The two parts of the question should not be marked separately.

Marks should be awarded according to the mark bands.

Or

(b) Structured question

(i) Describe how volcanoes are monitored to try to predict eruptions. ***[4 marks]***

Responses should include some of the following methods used to monitor volcanoes: study of the eruptive history of the volcano to determine patterns of activity, study of the structure of the volcano as an indication of the most likely type of eruption, monitoring seismic activity that indicates movement of magma below the volcano, the use of lasers to detect ground deformation, measurement of changes in gas emissions, monitoring changes in thermal properties of streams near the volcano, mapping past deposits using ground surveys or satellite photography, gravimetric surveys to determine changes in the size of the magma chamber, geo-electrical surveys to determine movements of bodies of magma. Not all of these are necessary for full marks; description of any four valid methods or of two methods in detail is enough to gain ***[4 marks]***.

(ii) Explain the difference between primary and secondary volcanic hazards, giving *two* examples in each case. ***[3+3 marks]***

Responses should state that primary hazards are a direct result of volcanic eruptions and involve materials being ejected from the volcano ***[1 mark]***.

Examples include: the ejection of lava either as fountains or as lava flows, pyroclastic flows and surges, lateral blasts including nueés ardentes, ash falls and ash clouds (hazardous to aircraft), volcanic gases, falls of tephra. Responses should include any two examples of primary hazards for ***[2 marks]***.

Secondary volcanic hazards do not result directly from the eruption ***[1 mark]*** and result from the environment created by the volcano.

Examples include: lahars, acid rain, flooding caused by heat from eruptions melting snowfields, glaciers or ice caps, volcanic landslides, tsunamis and climate change such as global cooling. Responses should include any two examples of secondary hazards for ***[2 marks]***.

(iii) Assess the extent to which responses C, D, E and F can be successfully applied to areas at risk from volcanic eruptions. ***[10 marks]***

Responses should examine each of the responses C, D, E and F separately and must only refer to volcanic eruptions and not hazards in general.

In terms of strategy C, responses should recognize that little can be done to control a volcanic eruption. Responses may refer however to attempts to control lava flows by spraying water as a coolant to stop the flow (Iceland 1973, Eldafell), or by the use of explosives to divert lava (Etna, 1983). The construction of earth barriers to divert lava (Etna, 2001) and the use of barrier dams to reduce the secondary hazard of lahars in Japan and Indonesia are relevant to strategy C. Other structures used to protect the community could include the provision of strong roofs against ash and tephra accumulation, or the construction of houses that can be moved in areas at high risk from lava flows.

In terms of strategy D, responses should note that a hazard risk map is essential to enable communities to avoid having settlements, farmland, roads, power and water supplies in areas of high risk. The success of such a strategy depends upon the willingness of the community to accept some economic loss. Stronger responses may note that not all countries have good records of past eruptions, making effective land use planning very difficult.

In terms of strategy E, responses should recognize methods of increasing community awareness and preparedness for the potential hazards which involve training and practice for evacuation and preparing household emergency food and medical supplies. This would require training community leaders, teachers, rescue services and health workers. Responses might indicate that this is one of the easiest and most effective strategies to initiate, but again it could depend upon the level of economic development of the community.

In terms of strategy F, responses could include evacuation procedures to save lives including the organization of temporary housing, food and water supplies and note that this is essentially the job of governments. Examples of evacuations could be used to illustrate the high level of success of this method, (Montserrat 1995 and 1996). The difficulties of providing rapid emergency relief could be considered. Responses may point out that such efforts are much more likely to be successful in MEDCs such as Japan where capital and resources are more readily available, communications are very effective and warning systems are more reliable. Responses to F may also refer to the planned involvement of outside aid agencies such as the Red Cross and the UN. Some might also consider how national pride may make some countries reluctant to ask for help and how political problems may affect the flow of relief aid from other countries.

It is not required that each strategy be discussed in equal depth and the marks need not be allocated evenly between the four strategies. Responses that give more emphasis to one or two strategies should not be penalized as long as all of the strategies are assessed in some measure.

Marks should be awarded according to the mark bands.

A5. Ecosystems and human activity

Either

(a) Essay

Examine the ways in which both natural and human factors can cause a named ecosystem to change over time. ***[20 marks]***

Although the size of ecosystem chosen might vary, one that is small-scale and has definable nutrient cycles, energy flows and food chains or webs would be most suitable. Examples might include a sand dune, a salt-marsh or a unit within a forest. Natural changes may be internally induced and should be explained with reference to vegetation succession and the processes of colonization, competition and dominance. The internal autogenic changes in soil and other environmental conditions generated by the vegetation itself allow a greater variety of species to colonize and survive. During these seral stages, biomass and productivity increase towards climax and stabilize when dominant species begin to exclude others. Naturally occurring external arresting factors such as volcanic disturbance, landslides and flooding might deflect the primary succession from its course resulting in a sub-climax. With time, normal conditions might be resumed leading towards a climax community. Alternatively, human interference such as burning or grazing by animals might deflect the primary succession towards a plagio-climax. This state might be maintained or if the arresting factors are removed, it might progress towards a climax community. Both natural and human factors may operate at the climax stage causing a regression to a state of sub-climax. Humans may also act to conserve the climax community.

A very good response will be expected to demonstrate an understanding of these processes using appropriate terminology. Failure to refer to one specific and named ecosystem or to examine both the physical and human causes of change will prevent the response moving beyond markband E. Answers that do not assess each response should not move above mark band F.

The marks should be allocated according to the markbands.

Or

(b) Structured question

(i) Identify *A* and *B*, and define *T3*. ***[3 marks]***

Accept any two of the following for **A** and **B** – heat, respiration, faeces or dead organic matter. Accept only secondary consumers or carnivores for **T3**.

(ii) Account for the changes in the size of the biomass along this food chain. ***[3 marks]***

Energy flows through the ecosystem from one trophic level to the next, but the process of energy transfer is inefficient and about 90 % is lost as heat or discarded as faeces to the environment. This means that only 10 % of the energy at one trophic level is fixed in the tissues of the subsequent level leading to a reduction in the amount of biomass. Award ***[3 marks]*** for three valid points.

(iii) Explain how agriculture can affect the biodiversity of an ecosystem. ***[4 marks]***

Intensive agriculture involves the modification and loss of natural habitats leading to the eventual disappearance of species. Pesticides and fertilizers are used to eliminate competitors and promote crop or livestock yield. Food chains are therefore shortened and the number of species is reduced ***[3 marks]***. An additional ***[1 mark]*** may be awarded if reference is made to more sustainable practices which attempt to conserve biodiversity.

(iv) Examine the influence of climatic factors upon the structure and function of *one* named ecosystem or biome. ***[10 marks]***

Climatic factors include precipitation, temperature, wind, humidity, light and length of growing season. These abiotic factors interact to determine the volume of biomass and level of productivity of the ecosystem. In the case of biomes, they largely conform to global climate zones. For example, optimum growing conditions within the tropics produce dense and stratified forests with high levels of productivity and rapid nutrient cycling. In contrast, low temperatures or lack of moisture outside the tropics can inhibit both structural complexity and reduce levels of productivity and nutrient cycling. Responses moving beyond band F must include a detailed examination of both structure and function and at least three climatic factors.

The responses should be marked according to the markbands.

A6. Climatic hazards and change

Either

(a) Essay

Referring to examples, explain what is meant by long-term drought and examine the importance of both physical and human factors responsible for its severity. ***[20 marks]***

There is a wide range of definitions, but the response should identify the following characteristics:

Long-term drought is an irregular and unexpected reduction in precipitation occurring over a long period, usually more than a season. Drought can occur in any climate, but is most serious and prolonged in arid regions with high variability in annual precipitation which may be delayed or deficient. Climates experiencing variable precipitation that are particularly vulnerable are savanna and monsoon.

Humans can contribute towards the causes of drought through actions such as deforestation, overgrazing and poor land management. Vegetation clearance often results in a reduction in moisture-holding capacity of the soil and increased albedo, both of which will reduce moisture further. A likely choice of example would be the Sahel where land degradation results from population pressure causing the exploitation of marginal areas which are particularly susceptible. An appropriate conclusion would be that physical factors are the fundamental cause of drought, but changes in land use and cover resulting from human activities can easily exacerbate dry conditions leading to serious drought.

Responses lacking examples should not move beyond band E.

The marks should be allocated according to the markbands.

Or

(b) Structured question

(i) Referring to the diagram, describe *three* trends in the temperatures between 1969 and 1998. ***[6 marks]***

Urban temperatures are rising ***[1 mark]***, with another ***[1 mark]*** for some quantification. Rural temperatures are rising ***[1 mark]***, with another ***[1 mark]*** for some quantification. The difference between urban and rural temperatures is increasing ***[1 mark]***, with another ***[1 mark]*** for some quantification.

(ii) Explain the possible reasons for the trends described in part (a). ***[6 marks]***

For full marks, at least three different reasons must be explained, with up to ***[2 marks]*** for each reason, provided it is developed in some detail. Possible reasons include (but are not limited to) increased air pollution, urban growth (increase in industry, traffic and number of homes), global warming, change of vegetation in rural areas.

(iii) Discuss the other ways, *excluding temperature*, in which the microclimate of urban areas differs from that of surrounding rural areas. ***[8 marks]***

Rural areas tend to have higher humidity, greater visibility, less frequent fog, higher wind speeds, less cloudiness, less rainfall, fewer rainy days, more snowfall (compared with inner city areas), and fewer thunderstorms than nearby urban areas. At least four distinct differences are required for the award of the full ***[8 marks]***. Discussion of the differences may legitimately include both the causes and the consequences of any differences identified.

SECTION B

B7. Contemporary issues in geographical regions

Either

(a) Essay

To what extent is the concept of distance decay helpful in defining the boundaries of any *two* regions of your choice? ***[20 marks]***

This question about the definition of regions is fundamental to regional geography. The extent to which the concept of distance decay is useful will depend on the two regions chosen, but both regions must be clearly defined. Responses involving an inappropriate choice or scale of region will be self-limiting.

Responses that fail to describe the concept of distance decay adequately may not move beyond band E.

Responses that refer to only one region may not move beyond band E.

Any response that fails to assess the extent of distance decay may not move beyond band F.

The marks should be allocated according to the markbands.

Or

(b) Structured question

(i) Suggest a service that the map may represent, and justify your choice. ***[1+1 mark]***

The map shows the functional regions of television stations. Any plausible response for a service likely to have functional regions should be accepted.

(ii) Describe the spatial pattern of regions in Iowa shown on the map. ***[3 marks]***

The largest region is in the centre of the state ***[1 mark]***. Smaller regions are located in two groups either side of the largest region, close to the eastern and western boundaries of the state ***[2 marks]***. Responses that describe the distribution in some other way should be marked on their merits.

(iii) Using an annotated map only, explain the factors that determine the size and shape of your local region. ***[5 marks]***

Up to ***[2 marks]*** for factors determining the size, including ***[1 mark]*** for an indication of scale, up to ***[2 marks]*** for factors determining shape and ***[1 mark]*** for some precise locational detail such as place names, or latitude and longitude. No credit should be given in this part for written material that is neither written on, nor linked to the sketch map by arrows or a key.

(iv) To what extent are the contemporary geographical issues of your local region due to its socio-political geography? ***[10 marks]***

This question examines how socio-political geography has resulted in contemporary geographical issues. The region should be clearly defined, and more than one issue identified. Responses involving an inappropriate choice or scale of region will be self-limiting.

Responses that fail to assess the extent of the issues may not move beyond band F.

The marks should be allocated according to the markbands.

B8. Settlements

Either

(a) Essay

Evaluate the management strategies adopted in specific cities or large towns to overcome urban deprivation and decay. ***[20 marks]***

Responses should show an understanding of the terms "deprivation" and "decay" by considering both the socio-economic as well as the environmental contexts. Discussion should involve a review of various strategies designed particularly to overcome problems produced by deindustrialization, dereliction, out-migration and social disadvantage, although not all these causes need to be specified.

The range of cities and strategies that might be discussed is large, but responses should cover more than one strategy and more than one city or large urban area.

In MEDCs discussion might cover a sequence of planning strategies. These might include initial slum clearance, their replacement with undesirable high-rise flats followed by more recent large-scale commercial developments involving urban development corporations and enterprise zones. The discussion might recognize that improvements in the physical appearance of inner cities may be counterbalanced by social inequalities created by the influx of wealthy newcomers. Recognition and evaluation of strategies designed to reduce such inequalities through education and improved employment opportunities would be relevant.

Discussion might also involve management strategies designed to address the serious infrastructural problems associated with rapidly growing cities in LEDCs. Self-help schemes and other strategies may be assessed in terms of their success in promoting social equality and urban sustainability.

Factual accuracy and reference to specific areas within named cities should be rewarded, whereas generalized or purely descriptive accounts should not move beyond band F.

The marks should be allocated according to the markbands.

Or

(b) Structured question

(i) Describe the changing relationship between the rural and urban population of each region between 1960 and 2020. ***[4 marks]***

In the case of Africa the proportion of urban population grows at an increasing rate relative to the rural population and by 2020 it has almost reached the rural level. In Europe the urban proportion is relatively high in 1960 and although its growth slows from 2000, its proportion increases as rural population falls.

For a maximum of ***[4 marks]***, changes in the relationship between the urban and rural population of each region should be mentioned. Reference to data is also essential.

(ii) Explain the changes in the proportion of urban population for each region shown in the diagram. ***[3+3 marks]***

Africa's increasing urban proportion can be explained mainly by rural to urban migration and to a lesser extent by natural increase. Push and pull factors are relevant, but a detailed discussion is not expected ***[3 marks]***. In Europe, the stability and eventual decrease in population results from natural change and counterurbanization, for which there should be a brief explanation ***[3 marks]***.

(iii) Select *one* country where the process of rapid urbanization is currently occurring and discuss the consequences of it.

[10 marks]

The emphasis of the response should be upon a recent and rapid process of urbanization. A broad range of consequences is expected and should include social, economic and environmental aspects. Responses which consider only the negative or positive consequences of urbanization for cities or overlook the effect upon rural areas should not move beyond band E.

The marks should be allocated according to the markbands.

B9. Productive activities: aspects of change

Either

(a) Essay

Analyse how changes in transport and communication have affected the global distribution of manufacturing industry. ***[20 marks]***

It is expected that responses will include a review of specific transport and communication improvements and link these to locational changes in global manufacturing. The key points of the discussion, most of which should be included in a good-quality response are outlined below:

Significant transport changes have occurred since nineteenth century, although it is acceptable for responses to disregard this era. These improvements in sea transport and railway networks allowed for expansion of manufacturing and international trade. More recently, the most significant developments have been the integrated international railway and road systems, the introduction of the commercial jet aircraft, the development of much larger ocean-going vessels and the introduction of containerization.

Transport systems are the means by which materials, products and people are transferred from one place to another exploiting their comparative advantages. Improvements in transport technology have allowed the process of globalization of manufacturing to occur through economies of scale and increased volumes of trade. Transport development has also been accompanied by rapidly increasing use of ICT (the Internet, land lines and mobile phones). Space-time convergence and global shrinkage are consequences of transport and communications development, and make manufacturing production more efficient. They have also allowed greater flexibility of industrial location. These beneficial consequences have resulted in the global dispersal of manufacturing industry through transnational corporations to the NICs and, more recently the RICs.

The marks should be allocated according to the markbands.

Or

(b) Structured question

(i) Select *one* region shown on the graph. Describe and suggest reasons for the trends in its fertilizer consumption. ***[4 marks]***

In the case of the region chosen, ***[2+2 marks]*** should be allocated to description and explanation. Trends should be described with close reference to the data given on the graph and explanations may relate to the whole region or countries within it.

In the case of North America and Western Europe, the trend is one of rise in fertilizer consumption responding to post-war demand for increased food production. This was stimulated by government subsidies and protectionist policies. Consequent overproduction, surplus food and environmental damage resulted in a reduction in fertilizer consumption. In Africa the changes in fertilizer consumption are very slight and are a result of the inability of poor countries to adopt new technologies. In South Asia consumption has increased dramatically in response to the green revolution and the ever-increasing demand for food from growing populations.

(ii) Name and describe *three other* types of new technology that have increased agricultural production since 1960. ***[6 marks]***

There is a large range of possibilities here, but they must all be technological and result in increased production. Social and economic changes are not relevant. Examples may include techniques which increase the agricultural yield such as high yielding varieties of crops typical of the Green Revolution and more recently GM crops; pesticides which suppress competitors, and other practices which extend the area of production such as irrigation, drainage and mechanization. Livestock production might be increased by intensive factory farming techniques and selective breeding. Award ***[2 marks]*** for each technological innovation that is correctly named and described.

(iii) To what extent can sustainable agricultural practices meet the food demands of increasing populations? ***[10 marks]***

Responses should show an understanding of sustainable agricultural practices and the way that they allow for continuous food production without environmental damage. Such practices might include soil conservation, maintenance of soil fertility, minimum cultivation, crop rotation, the application of organic fertilizers, mulching, biological pest control, careful use of irrigation, water conservation, a reduction in the use of artificial fertilisers, pesticides and energy subsidies and the switch from meat consumption to a vegetarian diet.

Very good responses accessing the highest markband should cover most of these points, but the emphasis may vary and depth may compensate for breadth. The discussion should weigh up the reality of supporting growing populations in areas such as Africa or South Asia using these less intensive organic techniques. Alternative new technologies such as GM crops might be considered as more realistic in the short-term. Good responses will assess the viability of sustainable practices by referring to a variety of examples. Descriptive accounts avoiding evaluation should not move beyond band F.

The marks should be allocated according to the markbands.

B10. Globalization

Either

(a) Essay

Analyse the effects of the growth of global tourism on the culture and environment of indigenous people, referring to examples. ***[20 marks]***

A clear understanding of "indigenous people" (meaning native) should be evident if not actually defined. "Culture" has a wide interpretation and includes customs, beliefs, religion, dress, morals, manners, music, art, food and many other traits. A good response will select examples which demonstrate distinct cultural contrasts between tourists and indigenous people so the effects are significant. However, the indigenous population need not be remote and an urban tourist destination in a LEDC may be used.

The growth in international tourist demand, the expansion of the global communications network and tourist-related TNCs, have exposed remote and less developed parts of the world. These regions may be explored and exploited for their cultural contrasts, "otherness" or pristine environments sometimes under the disguise of ecotourism. The impacts of tourism upon indigenous people and their culture may be negative and include the commercialization and dilution of culture and moral degradation. Other impacts such as loss of grazing rights in the Maasai game reserves have had both cultural and environmental repercussions. Environmental impacts are diverse, mainly negative and may include the destruction of local vegetation for the building of hotels, roads and airports, loss of plant and animal species and breeding grounds, water, traffic and noise pollution, soil erosion and land degradation through the overburden of solid waste. Responses should cite local environmental impacts which are directly related to the indigenous population living there.

Although some general observations are necessary, the focus of the response should be on examples and more than one is expected. Both cultural and environmental impacts should be covered, but not necessarily in each example used. Very good analytical responses will recognize the breadth of the question and include the positive as well as negative effects of growing tourism. Discussion of sustainable tourist projects involving local people and minimizing damage to their cultural traditions and environments would access markband F and above. Economic aspects may be mentioned, but only in connection with cultural and environmental impacts.

The marks should be allocated according to the markbands.

Or

(b) Structured question

(i) Define the term *globalization*. ***[2 marks]***

Globalization might be defined as "the flow of capital, and goods, money, culture, ideas and people between countries resulting in the increasing interconnectedness of the world economically, culturally and politically". Other similar and comprehensive definitions would be acceptable.

(ii) Suggest *two* indicators which might have been used to make up the globalization index. Explain your answer. ***[4 marks]***

The globalization index is based on four indicators showing the level of contact with other countries. These include economic integration, cross-border communication, technology and political engagement. Responses are not necessarily expected to include these four, and any other suitable and measurable indicators may be chosen ***[2 marks]***. Explanations should link the choice of each indicator to the globalization process ***[2 marks]***.

(iii) Describe and explain the relationship between the globalization index and life expectancy for the countries shown on the graph. ***[4 marks]***

There should be recognition of a positive relationship between the two variables ***[1 mark]*** and illustration through examples from the graph ***[1 mark]***. Explanation should relate the high levels of globalization to the acquisition of wealth and the associated increase in life expectancy ***[2 marks]***.

(iv) Referring to examples, discuss the ways in which globalization decreases the differences between countries. ***[10 marks]***

Responses should show an understanding of the process of globalization and include a discussion of a variety of ways in which it decreases the differences between countries. Evidence for decreasing difference might include references to culture; globalization has resulted in the adoption of common language, cultural traits and patterns of consumption. Globalization also makes a significant impact through economic activity resulting in environmental similarities in the form of homogenous rural and urban landscapes. Economic and political convergence encouraged by the global institutions may also be a product of globalization.

There may be other equally valid approaches to this essay which emphasize other aspects of globalization. Overall, the response should be discursive rather than descriptive to access band F and above.

The marks should be allocated according to the markbands.

SECTION C

C11. Topographic mapping

(a) Using the map only, locate the hill summits at Cham de Colas (482 127) and the 789 metre spot height (467 108).

(i) State the direct distance in kilometres between the two summits. ***[1 mark]***
(ii) Comment on their intervisibility. ***[2 marks]***

(i) The distance is 2.5 kilometres ***[1 mark]***.
(ii) The two summits are not intervisible ***[1 mark]***. They are obscured from each other by the intervening ridge at Puercheral ***[1 mark]***.

(b) Using both the map extract and the photograph:

(i) state the compass direction towards which the camera was pointing when this photograph was taken. ***[1 mark]***
(ii) state the evidence from the photograph which suggests that it was taken during the early morning. ***[1 mark]***
(iii) draw a labelled map of Florac showing its morphology, site and situation. ***[4 marks]***
(iv) explain the spatial distribution of functional zones in Florac and the pattern of its growth. ***[4 marks]***

(i) The camera was pointing towards the north-west ***[1 mark]***.

(ii) Reference should be made to the direction of the shadows ***[1 mark]***.

(iii) The map should be clearly drawn, labelled and include a title, scale and north-point ***[1 mark]***. The remaining ***[3 marks]*** should be awarded for accurate presentation of Florac's morphology, site and situation. These aspects should be indicated by its shape and the extent of its built-up area, its internal structure and street plan, its relative location and communication links to neighbouring settlements and to the river and surrounding uplands.

(iv) Explanation for functional zoning and growth may be combined, but should refer to both the map and the photograph. The award of ***[4 marks]*** should be given to a response that provides at least four valid explanations covering both functions and growth. For example, high building and street densities around the church (474 082) indicate a commercial and historic centre which developed when population was relatively low ***[1 mark]***. Growth has been restricted by areas of steep relief and limited accessibility, especially on the east side of the town ***[1 mark]***. However, more recent residential development has extended the built-up area on the more gentle western slopes at La Grazutlere and Les Grèzes ***[1 mark]***. The photograph's foreground shows low-density housing and public buildings (a school), recreational facilities (a football field and a gymnasium) and commercial functions such as a filling station. All of these functions require cheaper land and more space than the centre can offer ***[1 mark]***. Other valid explanations may be given. Responses which are only descriptive should be allocated a maximum of ***[2 marks]***.

(c) Using map evidence, examine the influence of physical features upon tourist activities in the whole area shown on the map extract. ***[7 marks]***

Responses should identify a variety of specific and located tourist activities, associated with the rivers, their valleys and the uplands. A good answer may be awarded a maximum of ***[7 marks]*** provided that at least three distinct physical features such as the following are thoroughly examined. The sinuous River Tarn and its tributary have natural features such as the gorge and the rapids (455 115) with significant aesthetic and recreational appeal and offering opportunities for canoeing (478 077). Campsites are generally found in accessible positions close to the river at settlements such as Bedoues and the Village de Vacances, but away from the areas liable to flooding. Other tourist activities such as hiking are indicated by the sign-posted footpaths, for example, the Tour de Mont Lozère running north from Florac through forest and the Tour de Causse Méjan in the south-west. The commanding position of the manor at (464 127) is another upland attraction. However, the majority of tourist activities are focused on settlements, which are located along the accessible valley floors. They provide tourist attractions themselves with notable monuments, places of interest and a tourist information centre such as those in Florac.

Responses are not expected to cover all these points and there are other possibilities, but they should recognize the relationship between physical features and tourist activities. The explanation should give reasons why tourists are attracted to a particular physical feature or area. Purely descriptive responses should receive a maximum of ***[4 marks]***.