

GCE

Geography

Unit 3 Contemporary Geographical Issues (GEOG3)
Exemplar Script 1

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Option 1 Plate Tectonics and Associated Hazards**Total for this option: 25 marks****0 1**

Study **Figure 1**, a satellite image of the Mayon volcano in the Philippines and the area to the south and east.

Comment on the nature of the hazards that this volcano may present.

*(7 marks)***Candidate's Answer**

This volcano is part of the Pacific ring of fire. It presents significantly dangerous hazard risks to the human population of the settlement of Legazpi. As Legazpi is at the foot of the slopes of the volcano it is vulnerable to hazards such as lava flows and pyroclastic flows (of ash and lava) which flow down the slopes of the volcano. [Clear comment, linking specific 'dangerous' hazards to the proximity of Legazpi] The fertile, green land surrounding the volcano and the coastal location suggest there will significant agricultural activities and therefore a high population density, which exacerbates the risk of hazards on the human population. The volcano is releasing minor amounts of smoke and ash, which indicates it is active and a serious threat. [Of what?] The small amounts of vegetation around the top of the volcano indicate it erupts regularly, but only in small amounts. There are many channels down the slopes of the volcano, in all directions, suggesting activity. These channels extend as far as the settlement of Legazpi, so it is certainly at risk of lava flows. [Clear reference to features on the photo, with links to hazards - another comment] There is also the risk of tephra and lava bombs from eruptions that could hit the town and cause loss of life. The dark areas of land approximately 10km away from the summit indicate the impact of tephra, and the town of Legazpi is within range of ejected volcanic matter. [Not sure what is being referred to here] As the volcano is situated along a plate boundary it is possible that seismic activity, earthquakes – or tsunamis due to the coastal location – could occur. The agricultural activity suggests that ash clouds from the volcano would be harmful to production. [Could have been better linked to previous point re smoke and ash, but not done so] [Two clear comments - Level 2 - 6 marks]

02

Describe and explain the characteristic features of various types of volcano. (8 marks)

Candidate's Answer

Shield volcanos are located at hotspots or at conservative plate boundaries. They are low, gently sloping volcanoes which erupt regularly and gently. The slopes are of a low gradient, and this is due to the basaltic lava which is present at these locations. These eruptions mainly consist of lava flows, and do not result in the eruption of tephra material. The lava at these locations is runny and flows long distances due to the fact it has a low silica content. An example of a shield volcano is Mauna Loa in Hawaii. Fissure eruptions occur along construction plate boundaries, and an example is the mid-Atlantic ridge. They consist of basaltic lava which creates gently sloping areas either side of a linear crack in the earth's surface. [Two types of volcano given - shield and fissure - with example for first. Level 2 accessed just]

Acid dome volcanoes have very steep sloping sides and can reach great heights. They often have parasitic cones along their slopes which erratically erupt lava. The lava at these volcanoes is andesitic and has a higher silica content, making it flow slower and being of a sticky nature. It is because of this that acid dome volcanoes are often plugged with semi-molten lava and erupt violently. [Third type]

Calderas volcanoes, such as Krakatoa in Indonesia, have large, deep craters filled with water. They have steep slopes due to the rhyolitic lava which is erupted from them. They frequently emit smoke and ash but erupt irregularly and violently. This is due to the viscous nature of the lava from calderas volcanos.

[Fourth type, plus example]

[Full range of volcanoes plus clear description, and explanation and some support.

Max Level 2 - 8 marks]

03

With reference to **two** volcanic events that you have studied from contrasting areas of the world, compare the ways in which volcanoes and their impacts have been managed. (10 marks)

Candidate's Answer

The Chaiten volcano in Chile erupted in May 2008. **[First volcano]** Its eruption consisted of pyroclastic flows and ash clouds, and had severely negative impacts on the population, and their livelihoods, of the nearby town of Chaiten. 90% of the town was flooded and many people were made homeless. The short term response to this eruption was the actions of the Chilean Navy to evacuate 4000 people from the town, taking them away from danger. The government also provided gas masks and clean water for the town as ash had made much of the water undrinkable. As houses had been destroyed, the Chilean Government provided a disaster stipend for people affected by the eruption, which varied between \$1200 and \$2200 a month per family. The authorities also upgraded the status of the volcano, as it had previously been classified as not a threat. Another long term response by the government was the replacement of livestock which had been asphyxiated by the ash clouds. The volcano has also begun to be monitored to try and warn of any potential future eruption. **[Clear specific detail of management of Chaiten]**

Mount Etna in Sicily is a composite stratovolcano which has erupted regularly for hundreds of years. **[Second volcano - not linked yet]** It was particularly dangerous in 2002, when severe lava flows destroyed the tourist centre in Piano Provenzana. As Etna is in a much more developed country, and erupts much more frequently, it is managed very differently to Chaiten. **[Clear linkage between the two volcanoes]** The Italian Government does not offer economic donations to families affected by the volcano. However it encourages families to rebuild their houses themselves or relocate elsewhere. One economic response offered by the government is favourable tax breaks to people affected by eruptions. Mount Etna is monitored extensively, and far more closely than Chaiten. **[More comparison]** A helicopter is used to measure the sulphur plume that is released by the volcano. Gas emissions on the ground are also recorded and feedback to a response centre which additionally monitors the silica levels of lava released from the volcano. The management of Mount Etna is continuous, with emergency services being on constant alert at nearby settlements. The government promote awareness of the dangers of Etna, especially to tourists who are the most frequent victims of the volcano. **[Clear specific detail of management of Etna]** Management on Etna is a much more long term strategy, and is more prediction orientated than the shorter term management of the Chaiten volcano. **[Clear statements of comparison]**

[Good detail of both volcanoes with comparison becoming more evident as the answer progresses. Good statement of comparison at the end. Not developed enough for top marks. Level 3 - 9 marks]

Option 4 World Cities**Total for this option: 25 marks****1 0**

Study **Figure 4** which provides elements of the Traffic and Transportation Policy in the city of Freiburg, Germany (October, 2008). Comment on its development as an integrated, efficient and sustainable transport system. *(7 marks)*

Candidate's Answer

*It is clear that since the 1970s Freiburg has created a far more efficient and sustainable transport system than it previously possessed. In terms of efficiency the addition of new routes and greater frequency of trains on the modern city rail system has served to reduce journey times and create a system which is far better suited to deal with a large population without the problems of overcapacity. The new Breisgau-S-Bahn allows people to travel to other German cities much faster which aids commuters and reduces money lost through lateness. The fact that the city railway serves 65% of the population means it is highly extensive and reduces need for car use. **[Clear comment based on evidence regarding efficiency]** The system is clearly highly sustainable for a number of reasons. The improved rail system both within the city and connectivity with other cities mean there is less need for the use of cars which emit high levels of pollution. Taking cars off the roads also reduces congestion and journey times. The creation of 500km of cycle networks is a very sustainable measure. It reduces pollution from petrol/diesel powered vehicles and also reduces then chance of accidents as cars and bikes compete for the roads. The pedestrianisation of the city centre also reduces pollutions and creates a 'safer more pleasant environment'. **[Clear comment based on evidence regarding sustainability]** It encourages people to visit the city centre and use shops and services. Finally the new 30km per hour zones also encourage pedestrianisation and the use of bicycles as there is less danger of accidents. **[Two clear comments - none on integration. Level 2, 6 marks]***

11

Outline characteristic strategies of waste management in urban areas.

(8 marks)

Candidate's Answer

Urban areas produce a large amount of waste as they cater for very large populations. In MEDC cities such as London waste management infrastructure is highly sophisticated. Every citizen is distributed with a bin for waste and a recycle bin. This is a very simple system so that opportunities for recycling are maximised which reduce overall waste and are better for the environment. Weekly or fortnightly collections mean that waste does not begin to pile up and rot which can lead to a less pleasant environment and even disease. The collection system is often run by private companies so that it is more efficient and makes better use of resources. However some problems do arise. Many people in urban areas such as London live in flats or apartments. This means they have to carry their waste down many flights of stairs which is a time consuming and unpleasant process. It often leads to a lack of care when separating out goods. Moreover the number of items that can currently be recycled is limited and so a large amount of waste in MEDCs ends up in landfills. **[Discussion of recycling in 'London', brief reference to landfill - some sophistication of thought]**

In LEDC cities waste management can often be a very large issue. Cities such as Nairobi in Kenya produce 1000 tonnes of waste per day. They have no sophisticated collection systems and so the majority of waste ends up dumped in rivers or in large piles within the city. This creates many problems as the waste creates a horrible stench and many children play by the waste and pick up disease. **[Drifting from the question here]** Chemical waste can get into the rivers and pollute the water supply. However some action is taken to deal with the waste in Nairobi. Many people, often children engage in scavenging on landfill sites. **[A form of waste management in a named context - scavenging]** They collect around 20 tonnes of rubbish per day. Organic waste is often collected for food or animal food and plastic bottle and metals are collected for recycling. This does create a degree of sustainability but it also leads to many problems for scavengers who often get sick or cut themselves. Composting is also present in Nairobi. An NGO distributes plastic bags to citizens who put their organic waste in them. These are collected weekly. This helps to reduce pile of rotting waste and creates better access to roads and less sickness many children. **[A third strategy - composting - with some detail]** However the problem remains very large and 94% of Nairobi's population remains in unsanitary conditions.

[A range of strategies, with some contextual detail. Some generality and some irrelevance. Mid-Level 2 - 6 marks]

- 1 2 Evaluate the success of **one or more** partnership scheme(s) in the regeneration of urban areas. (10 marks)

Candidate's Answer

An example of a partnership scheme is the Holly Street redevelopment in Hackney. It was carried out in the mid 90s by the Comprehensive Estates Initiative whereby £300 million was set aside for deprived areas such as Holly Street. **[Clear identification of valid scheme, with some detail]**

Holly Street had become an area of large urban deprivation by the early 1990s. In the 70s 19 "snakelike" tower blocks had been built which were now run down and accentuated opportunities for crime. In 1992 a local official said "it had some of the worst design plans in post war British Housing". Prior to its development 31% of people in Holly Street were unemployed, 71% were single parent families, 50% were on housing benefits, a large proportion had mental health problems and 80% of people had been registered to move away. **[Good background - providing criteria for success perhaps?]**

The Scheme itself involved replacing the run down tower blocks with new brick built buildings with pitched roofs and gardens as well as small blocks of flats. A new community centre was built to aid community cohesion as well as an elderly persons day centre. Importantly the Holly Street Youth Partnership was established to cater for children aged 9 to 19 to improve their skills and work prospects. **[More detail of the scheme]** The Scheme has been highly successful. In 1998 Tony Blair called it a "model for development". People's fear of crime has dropped to 5% and actual crime has been dramatically reduced. Litter and graffiti have been almost completely eradicated. Currently the number of people who want to live in the area is 95%, it was formerly 20%. **[Clear statements of success, with evidence]** However some issues still remain. Crime remains higher than surrounding London Boroughs and the area remains one of the poorest in London. Moreover in recent years there has been a trend towards former problems such as graffiti and the upkeep of buildings has not been very good. **[Rather generic counterview, but given nevertheless]**

In conclusion it is clear that the Partnership Scheme has completely reinforced to the aesthetics of the area which have had knock on social and economic benefits. However the Scheme was not comprehensive enough and some of the former problems have returned. **[Explicit summary - clear sense of focus of the question]**

[Clear detail of the scheme, with evaluation to the fore. Level 3 - 9 marks]

Option 2 Weather and Climate and Associated Hazards

- 20 Assess the relative roles of sub-tropical anticyclones and the inter-tropical convergence zone in creating the characteristic features of the climate of **one** tropical region that you have studied. (40 marks)

Candidate's Answer

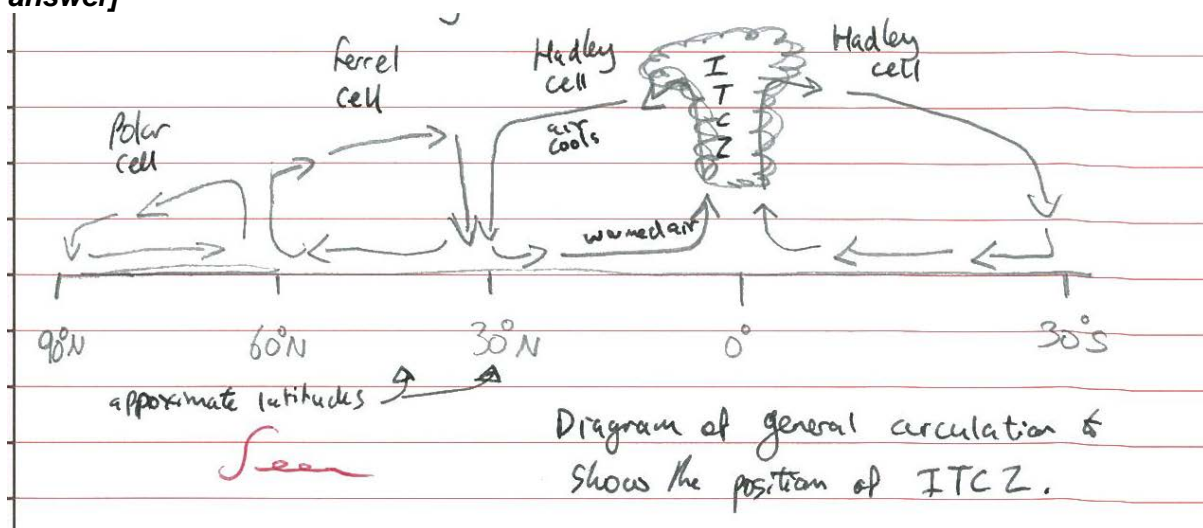
One tropical climate that is effected by sub tropical anticyclones and the inter tropical convergence zone is the monsoon climate of India. **[Clear identification of chosen climate region]** The monsoon climate is split into summer and winter monsoons. The summer monsoon lasts 4 months from around June until September and the winter monsoon lasts for the rest of the year from October to May. The summer monsoon is characterised by extremely heavy rainfall for very long periods of time and the winter monsoon is the opposite for the rest of the year. In summer Himalayan provinces can see up to 8000mm of rain in a day whereas Mumbai receives less than 50mm in winter. This climate is due to many effects, most of them caused by subtropical and anticyclone and the movement of the ITCZ. I will first explain what these are. **[Some evidence of knowledge here regarding the climate, brief synopticity with the reference to the variations Himalayas v Mumbai, and clear introduction]**

Anticyclones are weather systems characterised by high pressure, low winds, clear skies and relatively high temperatures. They are often called Tropical continental air masses as they originate over areas near the tropics where there is high insolation and so warmer air. As the air moves north it cools and begins to sink, this creates an area of high pressure. Because air began over a land mass it has relatively low humidity and so not much moisture condenses in it once it begins cooling. **[Background conceptual knowledge, with C/U towards the end]**

The tropical convergence zone is the area of the atmosphere that, on average, lies over the equator. It recieves high insolation and so is characterised by low pressure and often high levels of cloud of at least 5 oktas or more. The inter-tropical convergence zone moves throughout the year with the tilt of the Earth which I will explain in more detail later on.

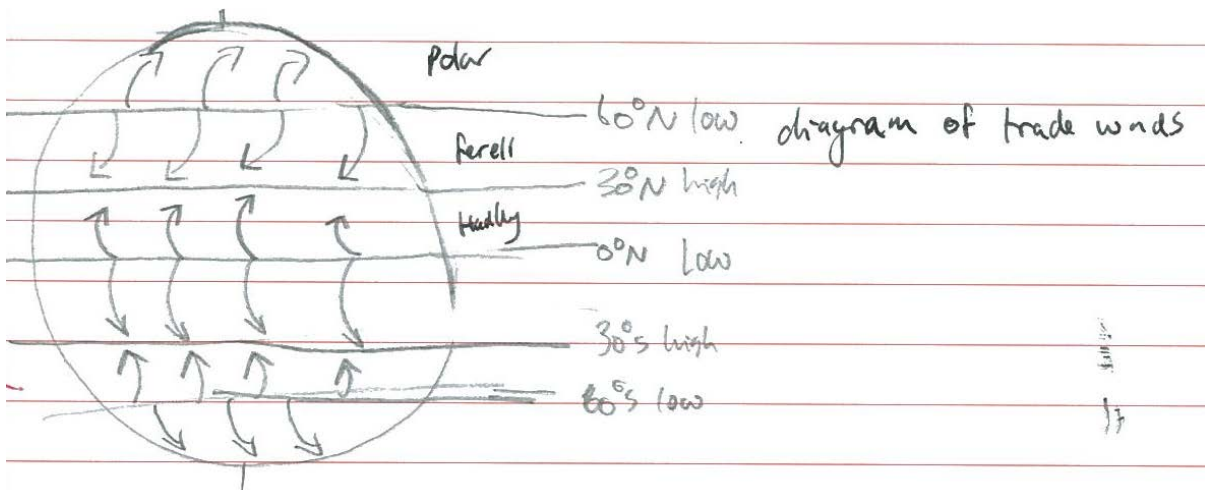
The reason there is often high levels of cloud is due to the low pressure caused by rising air. This air is moist and so adiabatic cooling causes condensation as the air rises. **[Good knowledge]**

[Diagram below also demonstrates knowledge, but the diagram is not linked into the answer]



In summer in the Northern hemisphere the North Pole is tilted towards the sun due to the Earth's axis about 30° . This is called the tropic of Cancer. The inter tropical convergence zone has therefore migrated 30°N , just to the North of India. This alters the prevailing wind direction India receives as it is now south of the Inter Tropical Convergence Zone. **[Evidence of synopticity - planetary influences]** The coriolis effects causes winds to be deflected right in the Northern hemisphere. Intense insolation in central Asia causes an area of low pressure to build up there. High pressure builds up over the Indian Ocean as this is where the migrated Hadley cell now causes falling air. **[Evidence of C/U]** There is a diagram on the next page. **[NB Diagram below referred to]**

This pressure gradient causes winds to blow across India, as winds blow from high pressure to low pressure. As the air does this it picks up moisture from the warm India Ocean and its high temperature means it picks up vast amounts of water. **[Knowledge]** As the moisture reaches India it is forced up over



the Western Ghats, a mountain range on the south west coast. The air cools adiabatically and so moisture condenses. The rapid rise in air creates tall cumulonimbus clouds and extremely heavy rain. This happens to even greater effect over the Himalayas and is called orographic rain fall. **[Synopticity - recognising the role of relief in this area, plus diagram below]**

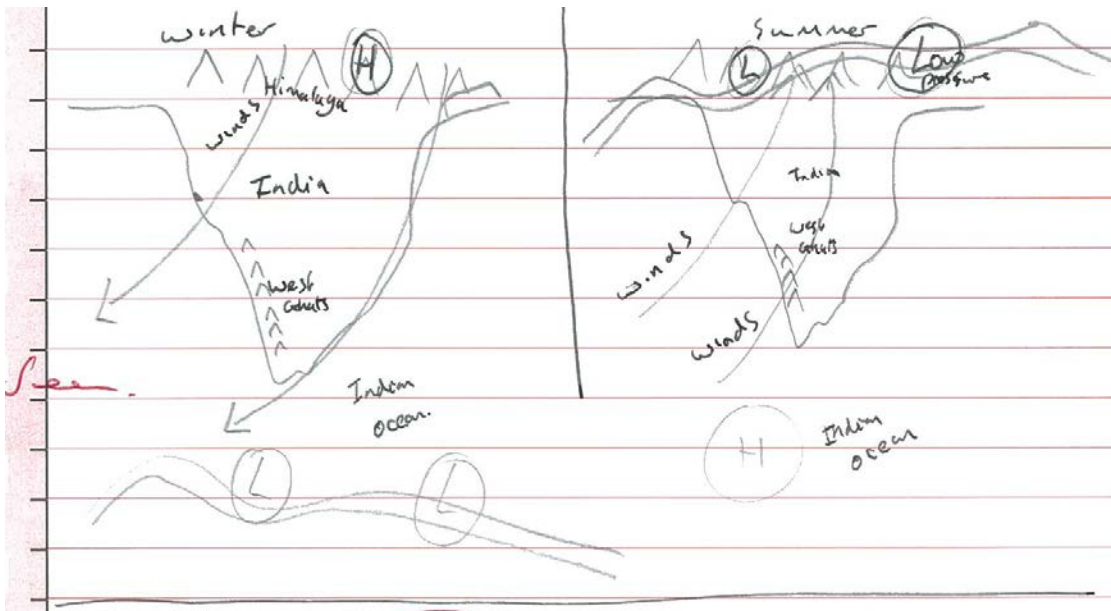


The part at which the sub tropical anticyclone comes in is mainly in winter but the high pressure over the Indian Ocean is an example of this.

In the winter the North Pole is tilted away from the sun and so the region that receives the most direct insolation is 30°S . The reason these areas receive the most insolation is due to the angle at which the sun's rays hit the earth's surface. At higher latitudes the energy from the sun hits at a more oblique angle so more energy is spread out over a larger area. This movement of the Intertropical Convergence Zone causes low insolation over central Asia and more over the Indian Ocean. **[More knowledge, C/U and synopticity here - more planetary scale factors]** The pressure gradient has therefore reversed and the winds blow out across India, into the Indian Ocean. This air is extremely dry as it has come from the middle of a huge land mass. It also warms as it travels toward the equator and because it has descended from the Himalayas. This means no moisture would condense if it had any in it. **[More C/U and synopticity here]**

A winter anticyclone forms in central Asia at this time due to the fact that the ITCZ has moved south creating the high pressure in Asia. In winter this creates conditions that are cold but clear as more radiation is escaping from the surface than the surface receives from the sun, causing the land to cool this anticyclone exacerbates the effects of the winter monsoon as it means the air is colder and drier which leads to little condensation over India.

[Evidence of knowledge - and C/U eg the use of 'exacerbates the effects']



[The diagram above is not referred - the candidate is expecting the examiner to link diagram to text]

In conclusion, the movement of the intertropical convergence zone during the course of the year has a much greater effect on this climate. **[A view expressed]** As the ITCZ moves North and South so do the areas of high and low pressure that characterise it. The anticyclones in subtropical regions are developed almost by the movement of the intertropical convergence zone and so the relative effect of the ITCZ is much greater than that of the anticyclones. The movement of the trade winds is largely caused by the movement of the ITCZ and the switch of prevailing wind, I feel, plays one of the largest parts in the creation of this climate's characteristics along with the position of India relative to the warm Indian Ocean. **[Some recognition that other geographical factors play a role]**

[Strong evidence of knowledge of the reasons for the monsoon climate of India, though some aspects of it are pure textbook rather than tweaking it for the India region. References to place are a little disappointing, with not a great detail of detail. However, the references that are made are relevant to the argument. Strong evidence of synopticity, focusing largely on the role of relief and altitude and broader planetary factors. Clear sense of task. A pity the diagrams were not used more effectively.]

Knowledge - Level 4

Critical understanding - Level 3

Case studies - Level 3 (lower)

Synopticity - Level 3 (higher)

Quality of argument - Level 3

Overall Level 3 (higher) - 28 marks.]