

**GEOGRAPHICAL ASSOCIATION OF WESTERN AUSTRALIA** [Inc.]

**ATAR GEOGRAPHY**

**Unit 1**

**Semester 1, 2020**

**MARKING GUIDE**

**for**

**Teachers ONLY**

**NOTE:**

**Some element of teacher discretion will be required for the allocation of marks for some questions, with specific reference to the quality of the answer.**

**Section One: Multiple-choice**  **20% (20 marks)**

**2.**

Each correct answer is worth **one (1)** mark.

|  |  |  |  |
| --- | --- | --- | --- |
| **Qu** | **Ans** | **Description** | |
| 1 | (b) | Comment | Careful observation of a number of areas on the map indicates the contours increase/decrease by a value of 10. |
| **Syllabus** | Interpret relief on a map using contours and height information (spot heights), to describe the steepness and shape of a slope (concave, convex and uniform). |
| 2 | (a) | Comment | The symbol for high voltage transmission line is clearly shown on the legend to the left hand side. |
| **Syllabus** | Interpret marginal information represented on maps (title, conventional signs contained in the legend, north point, numerical and linear scale).  Establish position on a map using alphanumeric grid coordinates, easting and northings, four figure area references, six figure grid references. |
| 3 | (c) | Comment | The scale of the map in Source 1 is shown as a ratio above the line scale (1:25 000). At this scale, one centimetre on the map represents 25 000 centimetres on the ground, which is the same as 250m. |
| **Syllabus** | Interpret and express scale in written, linear and ratio (representative fraction) formats, and convert scale from one form to another. |
| 4 | (b) | Comment | Closest to a half square in each of AR 0745 and AR 0746 and quarter squares in AR 0845 and AR 0846. Adding up to 1.5 grid squares which is 1.5 square kilometres. |
| **Syllabus** | Apply the map scale to basic calculations to determine time, speed, distance and area. |
| 5 | (a) | Comment | Using the information provided on the border of Source 1, students can approximate the latitude and longitude of the Police Station at GR 118487 is closest to 26° 41’ S 153° 07’ E. Other answers use a combination of eastings and northings or are back to front. |
| **Syllabus** | Establish position on a map using alphanumeric grid coordinates, easting and northings, four figure area references, six figure grid references and latitude and longitude expressed in degrees and minutes. |
| 6 | (a) | Comment | The general direction is between North East and East, therefore East, North East is the most correct answer. |
| **Syllabus** | Establish direction on a map using general compass directions and bearings.  Establish position on a map using alphanumeric grid coordinates, easting and northings, four figure area references, six figure grid references. |
| 7 | (d) | Comment | A bearing of 325 degrees is closest to the correct bearing as the feature lies North of North East (315°). |
| **Syllabus** | Establish direction on a map using general compass directions and bearings.  Establish position on a map using alphanumeric grid coordinates, easting and northings, four figure area references, six figure grid references. |
| 8 | (d) | Comment | The feature is a spur as it is an area of higher land jutting out into an area of lower land on three sides. |
| **Syllabus** | Identify different relief features (landforms including hills, valleys, plains, spurs, ridges, escarpments, saddles, cliffs and hydrological features (land subject to inundation, perennial and intermittent water bodies). |
| 9 | (a) | Comment | The journey is not uniform as there is a hill over 150 m in height along King Street (GR 058484). The contour patterns both north and south of the road indicate a decrease in height, therefore (a) is correct. |
| **Syllabus** | Identify different relief features (landforms including hills, valleys, plains, spurs, ridges, escarpments, saddles, cliffs and hydrological features (land subject to inundation, perennial and intermittent water bodies).  Interpret relief on a map using contours and height information (spot heights), to describe the steepness and shape of a slope (concave, convex and uniform) |
| 10 | (c) | Comment | The difference in height (Rise) between these two points is 50 metres, while the difference in distance (Run) is 300 metres. Ratio can be expressed as Rise/Run, 50/300 = 1:6. |
| **Syllabus** | interpret relief on a map using contours and height information (spot heights), to describe the steepness and shape of a slope (concave, convex and uniform), and calculate the average gradient. |

|  |  |  |  |
| --- | --- | --- | --- |
| **Qu** | **Ans** | **Description** | |
| 11 | (d) | Comment | Candidates need to ascertain the distance between two points on Source 1 and the same two points on Source 2. The measured distance between the two chosen features will be greater on Source 1, therefore the scale of Source 1 (topographic map) is larger. |
| **Syllabus** | Compare the different types of information available from remote sensing products with the information depicted on a topographic map.  Interpret the difference in scale between a photograph and a topographic map of the same place. |
| 12 | (b) | Comment | Candidates need to determine where the two features are located and how they are represented on Source 1. They then need to use the labeling or legend to determine what they are. |
| **Syllabus** | Use remote sensing products as an aid to interpreting natural and cultural features shown on topographic maps.  Identify and describe natural and cultural features and their patterns on the Earth’s surface using ground level photographs, aerial photographs (vertical and oblique), radar imagery and satellite imagery (Landsat, weather satellites and *Google Earth*).  Interpret marginal information represented on maps (title, conventional signs contained in the legend, north point, numerical and linear scale). |
| 13 | (c) | Comment | The photographer is facing the shoreline. Brisbane Road is directly in line with the direction the photo was taken and therefore the photographer is facing South, South West. |
| **Syllabus** | Determine direction on remote sensing products. |
| 14 | (d) | Comment | Definition as found in the glossary of the SCSA syllabus documents. |
| **Syllabus** | Classification of natural hazards (atmospheric, hydrological and geomorphic). |
| 15 | (c) | Comment | Definition as found in the glossary of the SCSA syllabus documents. |
| **Syllabus** | The spatial and temporal distribution, magnitude, duration, frequency, probability and scale of spatial impact of natural and ecological hazards at a global scale. |
| 16 | (b) | Comment | Definition as found in the glossary of the SCSA syllabus documents. |
| **Syllabus** | The spatial and temporal distribution, magnitude, duration, frequency, probability and scale of spatial impact of natural and ecological hazards at a global scale. |
| 17 | (c) | Comment | Candidates will need to demonstrate correct and accurate line graph interpretation skills |
| **Syllabus** | Examples of natural hazards, including storms, cyclones, hurricanes, typhoons, tornadoes, frosts, droughts, bushfires, flooding, earthquakes, volcanoes and landslides.  Interpret and construct tables and graphs, including: picture graphs; line, bar and compound graphs; histograms; scattergrams; climatic graphs; pie graphs; flowcharts and population pyramids. |
| 18 | (b) | Comment | Candidates will need to demonstrate correct and accurately graph interpretation skills |
| **Syllabus** | Examples of natural hazards, including storms, cyclones, hurricanes, typhoons, tornadoes, frosts, droughts, bushfires, flooding, earthquakes, volcanoes and landslides.  Interpret and construct tables and graphs, including: picture graphs; line, bar and compound graphs; histograms; scattergrams; climatic graphs; pie graphs; flowcharts and population pyramids. |
| 19 | (c) | Comment | Candidates will need to demonstrate correct and accurate choropleth map interpretation skills. |
| **Syllabus** | Ecological hazards, including environmental diseases/pandemics (toxin-based respiratory ailments, infectious diseases, animal-transmitted diseases and water-borne diseases) and plant and animal invasions.  interpret and apply data from different types of statistical maps (isopleth/isoline maps, choropleth maps, proportional circle maps, overlay and dot distribution maps). |
| 20 | (d) | Comment | Stated as a virus in question lead, candidates should know that viruses are typically infectious diseases. |
| **Syllabus** | Ecological hazards, including environmental diseases/pandemics (toxin-based respiratory ailments, infectious diseases, animal-transmitted diseases and water-borne diseases) and plant and animal invasions.  Interpret and apply data from different types of statistical maps (isopleth/isoline maps, choropleth maps, proportional circle maps, overlay and dot distribution maps). |

**3.**

**4.**

**Section Two: Short response 40% (40 marks)**

Refer to **Source 1:** Mooloolaba topographic map 1994 to answer Questions 21 – 23.

**Question 21 (2 marks)**

Describe **two (2)** characteristics of the site and **two (2)** characteristics of the situation of Headland Golf Course located in AR 0947 and AR 0948.

located in AR 0649.

**Syllabus:**

Describe the site and situations of places.

**Key word:**

*Describe*: provide characteristics and features.

**Teacher Notes:**

Site can be described by referring to the physical characteristics of a place. Site characteristics should be described accurately in full sentences, using correct geographical terminology. Features referred to should be for the site of the feature, not areas kilometres away (one or more grid squares)! Site features may include:

* Topography – height, gradient, slope - e.g. ~ 10 - ~20 m asl (most candidates will say 10 – 20m – accept this), undulating land.
* Landforms – floodplain, valley - e.g. coastal plain.
* Drainage – rivers, lakes, swamps - e.g. some small lakes (probably not natural – teacher discretion to be used).
* Vegetation – evidence of original natural vegetation in the area - e.g. some remnant vegetation (note: not directly labelled on key so few students may refer to vegetation, may need some leniency for those that do).
* Soils – e.g. coastal, may assume sandy as on coastal plain. Some may say alluvial, associated with the nearby stream/creek

Situation can be described by referring to the location of a place in relation to its surroundings or its proximity to other places or features. Situation characteristics should be described accurately in a full sentence, using appropriate geographical terminology. Situation features may include:

* Distance and direction from other settlements, major features or major transport intersections

e.g. 1½ - 2 km West, North west of Sunshine Motorway interchange. 2 – 2 ½ km South West of Alexandra Headland (coastline).

* Latitude and longitude - e.g. 26° 41’ S 153° 06’ E.
* Location in relation to or on major transport routes - e.g. north of Karawatha Drive on Golf Links Road.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Correctly describes any **one (1)** site characteristic (e.g. elevation, natural drainage, natural vegetation, slope and soil). | 1 |
| Correctly describes any **one (1) other** site characteristic (e.g. elevation, natural drainage, natural vegetation, slope and soil). | 1 |
| Correctly describes any **one (1)** situation characteristic (e.g. latitude and longitude, distance and direction from other places or features, location in relation to major transport routes). | 1 |
| Correctly describes any **one (1) other** situation characteristic (e.g. latitude and longitude, distance and direction from other places or features, location in relation to major transport routes. Can give a second distance and direction reference). | 1 |
| **TOTAL** | **4** |

Refer to **Source 1:** Mooloolaba topographic map 1994 to answer Questions 21 – 23.

**Question 22 (2 marks)**

If you were travelling along Route 70, the Sunshine Motorway, at 70 km/h between the intersection at GR 049451 and the intersection at GR 110474, calculate how long your journey would take? Show both your method of calculation and your answer.

**5.**

**Syllabus:**

Apply the map scale to basic calculations to determine time, speed, distance and area.

**Key word:**

*Calculate*: ascertain/determine from given facts, figures or information.

**Teacher notes:**

The distance between to two points on the map is approximately 28 cm (accept 27.5 – 28.5 cm), which represents 7 km (accept 6.865 km – 7.125 km) in the real world. The time taken is 6 minutes. (Mental arithmetic tells us the that if we are travelling 70 km in 60 minutes we will travel 7 km in 6 minutes).

Students need to show how they worked this out. The cross-multiplication method is a common way to calculate this:

X

Speed (70 km) Distance (7 km)

Time (60 mins) Time (?? mins) **=** 60 x 7 / 70 = **6 minutes**

**Another method is:**

X

60

1

Distance

Speed

Time **=**

X

60

1

7

70

Time **=**

**=**  **6 minutes** (accept slight variation in accordance with distance – teacher discretion).

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Correctly shows **calculations** to determine their answer. (Answer may be correct or incorrect depending on whether they determined correct distance between the two features – this mark is for correct and logical method of calculation demonstrated). | 1 |
| Correct answer is provided due to correct determination of distance and application of formula. | 1 |
| **TOTAL** | **2** |

Refer to **Source 1:** Mooloolaba topographic map 1994 to answer Questions 21 – 23.

**Question 23 (4 marks)**

Describe the nature of the hydrological features, and the spatial relationship between the hydrological features and settlement, in the two areas listed below.

1. The area bordered by eastings 05 and 07 and northings 47 and 49.
2. The area bordered by eastings 10 and 12 and northings 46 and 49.

**6.**

**Syllabus:**

Identify different relief features (landforms, including hills, valleys, plains, spurs, ridges, escarpments, saddles, cliffs), types of natural vegetation cover and hydrological features (land subject to inundation, perennial and intermittent water bodies).

Identify, describe and interpret spatial patterns (including land use, settlement and transport), and spatial relationships between natural and cultural features on maps.

**Key words:**

*Describe:* provide characteristics and features.

*Spatial relationship*: the relationship between the distribution patterns of different phenomena on the Earth’s surface.

*Hydrological features*: all naturally occurring and human-made surface water features in an area

*Settlement:* as indicated on the map key – the yellow/orange coloured areas.

**Teacher Notes:**

The area bordered by eastings 05 and 07 and northings 47 and 49**:**

* Nature of – series of high-density perennial streams displaying a dendritic drainage pattern.
* Relationship between hydrological features and settlement – few creeks through areas of settlement, little settlement in areas where many creeks are flowing through.

The area bordered by eastings 10 and 12 and northings 46 and 49

* Nature of – natural water courses (Mountain Creek and Moolooaba River) have been heavily modified into human-made residential canals/inland waterways.
* Relationship between hydrological features and settlement – settlements and canal development have occurred together. Canal development is for settlement.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| **2 x 2 marks** |  |
| Accurately describes both the nature of the hydrological features, and the spatial relationship between the hydrological features and settlement, in the given area. | 2 |
| Only describes either the nature of the hydrological features OR the spatial relationship between the hydrological features and settlement, in the given area. | 1 |
| **TOTAL** | **4** |

Refer to **Source 1:** Mooloolaba topographic map 1994 and **Source 2:** Mooloolaba satellite image 2020 to answer Question 24.

**Question 24 3 marks)**

Locate and describe **one (1)** example of a land use change that can be observed in **Source 2** when compared to **Source 1**.

**7.**

**Syllabus:**

Use combinations of remote sensing products and topographic maps to provide information based on change over time.

Use remote sensing products as an aid to interpreting natural and cultural features shown on topographic maps

**Key words**

*Locate*: indicates where on the topographic map the feature is located, typically by using an Area Reference or Grid Reference or making reference to transport links, distance and direction from a significant feature or possibly latitude and longitude.

*Describe*: provides characteristics and features.

**Teacher notes:**

In describing a change, it is necessary to describe both what was present previously and what is present now; otherwise a change has not been described.

Answers could include:

* AR 0545, 1994 semi cleared land, few roads, few buildings (none on western side), 2020 increase in commercial and residential structures in this area.
* AR 0645 1994 cleared land, 2020 increased residential.
* GR 052462, 1994 natural vegetation, 2020 expansion of residential area.
* AR 0547, AR 0548 (eastern section), 1994 semi-cleared natural vegetation, two roads, 2020 low density residential. Also, in AR 0647.

Other locations and examples will need to be checked by marker.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| * Correctly locates an area of land use change. * Describes what the land use was in 1994. * Describes what the land use is in 2020. | 3 |
| Provides correct answer for two of the above points. | 2 |
| Provides a correct answer for one of the above points. | 1 |
| **TOTAL** | **3** |

**8.**

Refer to **Source 1:** Mooloolaba topographic map 1994 and **Source 3:** Mooloolaba oblique aerial photograph 2020 to answer Question 25.

**Question 25 (4 marks)**

Locate and describe one piece of evidence from **Source 1** and one piece of evidence from **Source 3**, which support the statement that the Mooloolaba region relies heavily on income from tourism and recreation activities.

**Syllabus:**

Identify and interpret natural features and cultural features on a map.

Identify and describe natural and cultural features and their patterns on the Earth’s surface using ground level photographs, aerial photographs (vertical and oblique), radar imagery and satellite imagery (Landsat, weather satellites and Google Earth)

**Key words:**

*Locate*: indicates where on the topographic map the feature is located, typically by using an Area Reference or Grid reference or making reference to transport links, distance and direction from a significant feature or possibly latitude and longitude.

*Describe*: provides characteristics and features.

**Teacher Notes:**

Evidence from **Source 1** may include:

* Information Centres at GR 103512, GR119489, GR 050482
* Headland Golf Course at AR 0948
* Surf Life Saving Clubs at GR 103517 and GR 107502
* Wisemans Lookout GR 073492
* human-made canal developments – various.

Evidence from **Source 3** may include:

* high-rise development along the coastline, one street back from the beach – likely used as holiday apartments and hotels
* beachside developments such as parks and cafes
* beachside parking, access to beaches, parks, cafes
* inland waterways and boating facilities, left-hand background of photograph.

Evidence from the map and photograph is required and not on prior knowledge or insight.

Teacher discretion needed for other evidence or features identified by candidates.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| **2 x 2 marks** |  |
| * Correctly locates evidence or a feature associated with tourism or recreation. * Describes what the evidence/feature is and how it relates to tourism or recreation. | 2 |
| Provides a correct answer for only one of the above points | 1 |
| **TOTAL** | **2** |

**Question 26 (4 marks)**

Define the following terms and give an example of each.

1. Geomorphic hazards
2. Water-borne diseases

**9.**

**Syllabus:**

Classification of natural hazards (atmospheric, hydrological and geomorphic).

Ecological hazards, including environmental diseases/pandemics (toxin-based respiratory ailments, infectious diseases, animal-transmitted diseases and water-borne diseases) and plant and animal invasions

**Key words:**

*Define:* state meaning and identify essential qualities*.*

*Geomorphic hazards*: those hazards that originate from movements and processes within the earth’s lithosphere

*Water-borne diseases*: those diseases that are caused by a variety of microorganisms, biotoxins and toxic contaminants that are transmitted in water.

**Teacher notes:**

Examples of Geomorphic hazards – volcanic eruptions, earthquakes, tsunamis, associated landslides and mass movements.

Examples of Water-borne diseases – cholera, dysentery, diarrhoea, meningitis, trachoma.

Teacher discretion needed for other examples identified by candidates.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| **2 x 2 marks** |  |
| Includes a correct definition of the hazard type and a correct example. | 2 |
| Only includes a correct definition of the hazard type **OR** a correct example, not both. | 1 |
| **TOTAL** | **4** |

**10.**

Refer to **Source 5:** The decade of the last recorded case of paralytic polio by country to answer Question 27.

**Question 27 (3 marks)**

With specific reference to **Source 5**, describe both the spatial and temporal pattern of decline in the recorded cases of paralytic polio.

**Syllabus:**

The spatial and temporal distribution, magnitude, duration, frequency, probability and scale of spatial impact of natural and ecological hazards at a global scale.

Interpret and apply data from different types of statistical maps (isopleth/isoline maps, choropleth maps, proportional circle maps, overlay and dot distribution maps)

**Key words:**

*Describe*: provides characteristics and features.

*Spatial distribution*: the distribution of geographical phenomena across the Earth’s surface.

*Temporal distribution*: the distribution of geographical phenomena over time.

**Teacher Notes:**

Question should not be viewed as a ‘do you know your countries’ quiz. Students should be able to name continents and regions.

General observations: (always some exceptions!):

* First signs of eradication in 1960s – New Zealand, some parts of Northern and Central Europe.
* By 1970s – Australia, North America (excluding Mexico), N. Europe (Sweden), some parts of S. America (Chile, Paraguay).
* 1980s – South America, Central Europe (excluding Germany), parts of Africa.
* 1990s – Majority of Asia (except India, Pakistan, Afghanistan – central southern Asia), northern and southern regions of Africa.
* 2000s – majority of Central Africa.
* 2010s – India, Somalia.
* Still endemic in three countries.

Student may organise answer by decades or regions. Teacher discretion needed for other relevant points.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| A thorough and methodical description of where and when the pattern of decline in the recorded cases of paralytic polio is given. Specific dates (decades) are referred to and as a minimum, continents/regions are referred to. Relevant geographical terminology and full sentences are used. | 3 |
| A description of where and when the pattern of decline in the recorded cases of paralytic polio is given. Some dates (decades) and continents/regions are referred to. Geographical terminology and full sentences are used. | 2 |
| Limited description of where and when the pattern of decline in the recorded cases of paralytic polio is given. Few dates (decades) and continents/regions are referred to. Limited use of geographical terminology. Full sentences and poor literacy skills may contribute to a response that is difficult to understand. | 1 |
| **TOTAL** | **3** |

Refer to **Source 6:** Community risk from hazards to answer Question 28.

**Question 28 (6 marks)**

Explain how the characteristics of **one (1)** of the factors listed under *Hazards* and **one (1)** of the factors listed under *Community Assets* on **Source 6** may contribute to the level of *Risk* a community may experience due to a hazard.

Support your answer with examples.

**11.**

**Syllabus:**

Use systems and flow diagrams to organise thinking about relationships systems

The concepts of risk and hazard management as applied to natural and ecological hazards

**Key words:**

*Explain*: relate cause and effect; make the relationships between things evident; provide why and/or how.

*Risk*: the level of exposure to injury or loss.

**Teacher Notes:** Some relevant points:

HAZARDS:

* **Location** - location of human settlements. Location in relation to aspects of the physical environment, known hazard sources and climate characteristics that may intensify the impact of the hazard. Greater proximity, greater the risk.
* **Extent (Magnitude/Strength)** – stronger the magnitude/strength, greater the level of risk
* **Previous Occurrences** – Damage from previous events, recovery not completed, greater the risk. Common occurrence in the past, greater the risk in the future.
* **Future Probability** – linked to previous points, closer, stronger, more often, greater risk.

COMMUNITY ASSETS:

* **Population** – Population size in relation to density of human settlement, numbers exposed to hazard. Increasing population density and urbanisation. Greater the risk.
* **Built Environment** - Nature of human settlements. Materials used in construction of associated buildings and structures. The quality of infrastructure and utility supplies – water supply infrastructure (collection, storage, distribution), water treatment, sewage infrastructure/plants, storm water drainage, transport infrastructure, power supply infrastructure. All linked to risk.
* **Natural Environment** - the physical environment and climate characteristics that may intensify the impact of the hazard. Linked to proximity. Any natural protective factors.
* **Economy** – resource level and capital will influence ability to prepare and respond/recover, thus level of risk.

Teacher discretion needed for other relevant points.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| **2 x 3 marks** |  |
| Correctly explains how the chosen factor contributes to the level of risk a community may experience due to a hazard. Specific supporting evidence and examples of hazard events are provided to strengthen the explanation. Relevant geographical terminology and full sentences are used. | 3 |
| Explains how the chosen factor contributes to the level of risk a community may experience due to a hazard. Some supporting evidence and examples of hazard events are provided to strengthen the explanation. Geographical terminology and full sentences are used. | 2 |
| Limited explanation of how the chosen factor contributes to the level of risk a community may experience due to a hazard. Few if any examples of hazard events are provided to strengthen the explanation. Limited use of geographical terminology, full sentences and poor literacy skills may contribute to a response that is difficult to understand. | 1 |
| **TOTAL** | **6** |

**12.**

Refer to **Source 7:** Disaster occurrences and impacts, by region, 2005 – 2018 to answer Question 29.

**Question 29 (6 marks)**

Referring to specific data and regions shown on **Source 7:**

1. Explain the patterns of the three disaster characteristics: O*ccurrences*, *Deaths & missing*, and *Total economic loss*, for the Americas. (3 marks)
2. Explain the patterns of the three disaster characteristics: O*ccurrences*, *Deaths & missing*, and *Total economic loss*, for Asia.

(3 marks)

**Syllabus:**

The spatial and temporal distribution, magnitude, duration, frequency, probability and scale of spatial impact of natural and ecological hazards at a global scale.

Interpret and construct tables and graphs, including: picture graphs; line, bar and compound graphs; histograms; scattergrams; climatic graphs; pie graphs; flowcharts and population pyramids.

**Key word:**

*Explain*: relate cause and effect; make the relationships between things evident; provide why and/or how.

**Teacher Notes:** Some points to consider:

AMERICAS

* Generally, a high level of disaster occurrence (46.4 % of total), largely due to plate boundaries along western edge of continents - earthquakes and volcanic eruptions, tropical storms in the tropical regions and higher occurrence of many biological diseases in South America.
* Deaths & missing levels very low (11.9% of total) compared to occurrence. High levels of anticipation, preparation, mitigation, adaptation, response and recovery and related resources in North America. South America not as affluent, but generally still well trained in anticipation and response.
* Economic loss relatively high (39.1% of total), especially compared to deaths & missing, due to high asset levels in relation to industry, agriculture, urban areas (North America). While possibly lower in South America, economic impacts on agriculture and urban areas still high.

ASIA

* Moderate level (22.9%) of total disasters (could be lack of reliable data and reporting, but it is doubtful whether students will pick this up and it is only conjecture). Southern regions prone to geomorphic hazards and atmospheric hazards. Level of biological diseases vary greatly across the region.
* Deaths & missing is huge (69.7%), greatly disproportional to level of disaster occurrence. Contains four of the five and six of the ten most populated countries in the world. Overall lower standard of living and liveability measures would indicate higher mortality and missing rates in many countries throughout Asia, through lack of preparation, mitigation, adaptation measures before a disaster strikes and poorer abilities to respond and recover.
* Economic loss highest (42 %). Though not as affluent overall as North America, some countries such as China and Russia have very high level of assets which may be impacted economically. Others, such as Nepal, are at the other extreme. Total population level will result in high level of economic loss.

A good answer will make **specific reference to data** from the Source. Other relevant points may be made and teachers will use their own discretion in making validity and relevance.

**See next page for Marking Key**

**Marking Key:**

**13.**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| **2 x 3 marks** |  |
| Correctly explains the pattern shown in Source 7 for all three of the measures asked of, for the specific region, providing valid reasons for the levels shown. Refers to the source and specific supporting evidence and examples of hazard events and conditions to strengthen the explanation. Relevant geographical terminology and full sentences are used. | 3 |
| Explains the pattern shown in Source 7 for the majority of the measures asked of, for the specific region, providing adequate reasons for the levels shown. Refers to the source and some supporting evidence and examples of hazard events and conditions to strengthen the explanation. Geographical terminology and full sentences are used. | 2 |
| Describes the pattern shown in Source 7 for some of the measures asked of, for the specific region, providing few if any valid reasons for the levels shown. The source is not specifically referred to and few if any examples of hazard events or conditions are used to strengthen the explanation. Limited use of geographical terminology, full sentences and poor literacy skills may contribute to a response that is difficult to understand. | 1 |
| **TOTAL** | **6** |

**Question 30 (4 marks)**

Describe how spatial technologies may be used to study, monitor or respond to the occurrence of:

1. a natural hazard (b) an ecological hazard

**Syllabus:**

The role of spatial technologies in the study of natural and ecological hazards.

**Key words:**

*Describe:* provides characteristics and features.

*Spatial technologies*: any software or hardware that interacts with real-world locations. Global positioning systems (GPS), Google Earth, geographic information systems (GIS) and the use of satellite images, drone technolohy are the most commonly used spatial technologies to visualise, manipulate, analyse, display, record and respond to spatial data.

**Teacher Notes:**

A number of general uses may be applied to a natural or ecological hazard.

NATURAL HAZARD

* *Google Earth* to locate settlements, remote regions, examine topography, transport routes …
* satellite, aerial, drone photography to capture movements and changes in a specific, natural phenomena
* GIS to map change in numerous variables, map previous impacts, many relevant variables can be mapped, examined and compared
* drone technology used to capture images, map, reach inaccessible locations, even bring in supplies

ECOLOGICAL HAZARD

* *Google Earth* to locate settlements, remote regions, examine topography, transport routes …
* satellite, aerial, drone photography to capture movements, rates of infection/spread and changes in a specific ecological hazard
* GIS to map change in numerous variables, map previous impacts, many relevant variables can be mapped, examined and compared
* drone technology used to capture images, map, reach inaccessible locations, even bring in supplies or dispense information

Teacher discretion needed for other examples identified and relevant explanations given by candidates.

**14.**

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| **2 x 2 marks** | **4** |
| **Natural hazard.** Identifies a natural hazard type. Correctly describes how a relevant example of spatial technology is being used to study, monitor or respond to the natural hazard chosen. Refers to specific examples to strengthen their answer. Geographical terminology and full sentences are used. | 2 |
| Identifies a natural hazard type. Description of how a relevant example of spatial technology is being used to study, monitor or respond to the natural hazard type, or the actual spatial technology being referred to, may not be clear. No specific examples provided. Limited or no geographical terminology. | 1 |
| **Ecological hazard.** Identifies an ecological hazard type. Correctly describes how a relevant example of spatial technology is being used to study, monitor or respond to the ecological hazard chosen. Refers to specific examples to strengthen their answer. Geographical terminology and full sentences are used. | 2 |
| Identifies an ecological hazard type. Description of how a relevant example of spatial technology is being used to study, monitor or respond to the ecological hazard type, or the actual spatial technology being referred to, may not be clear. No specific examples provided. Limited or no geographical terminology. | 1 |
| **TOTAL** | **4** |

**15.**

**Section Three: Extended response 40% (40 marks)**

**PART A: Depth Study 1 Answer either Question 31 or Question 32 20% (20 Marks)**

**Question 31 (20 marks)**

1. Describe the spatial distribution of a natural hazard you have studied and how **one (1)** biophysical process and **one (1)** human process has influenced this distribution.

(8 marks)

**Syllabus:**

The spatial and temporal distribution of the hazard and how an understanding of biophysical and human processes can be used to explain the patterns that are identified.

**Key words:**

*Describe*: provide characteristics and features.

*Spatial distribution*: the arrangement of geographical phenomena or activities across the earth’s surface; the location of features of a place; how features are arranged across the surface of the earth.

*Biophysical process*:= the atmospheric, biological, chemical and physical processes that take place in the lithosphere, hydrosphere, atmosphere and biosphere.

*Human process:* *(In the context of hazards)* actions taken by individuals or communities, relating to settlement, livlihood and lifestyle, which inadvertantly may contribute to a hazard event occuring.

**Teacher Notes:**

Due to the scope of depth studies that can be used in this unit, the teacher will have to use their discretion when deciding if the student’s answer supports the question.

**Spatial distribution** of the natural hazard should include where the hazard occurs and the patterns associated with this distribution.

**Note 1:** processes should **relate to spatial distribution**, NOT vulnerability, magnitude or impact.

**Note 2:** for some natural hazards, such as earthquakes, it can be argued that human processes have little impact on their distribution; hence the marking key is not divided into a 4 + 4 division of the marks. Candidates should still mention this fact and may argue that people being present is what makes it a hazard rather than just a natural phenomenon.

**Biophysical processes** may include the following where relevant:

* atmospheric process and patterns associated with pressure and wind systems
* climatic components such as rainfall, winds and temperature
* components of the water cycle
* tectonic processes, movements and their location
* the nature of, distribution of and variations in soil types, rock types and vegetation types
* fuel loads
* slope materials and processes
* drainage patterns and characteristics
* others not mentioned may be relevant to specific natural hazards.

**Human processes** may include the following where relevant:

* nature and location of human settlements
* activities associated with and the nature of agricultural practices
* activities associated with and the nature of mineral extraction practices
* water catchment management and structures associated with water storage, distribution and power generation
* management practices associated with forest reserves and bushland areas
* specific structures built along coastlines
* pre-emptive programs and processes that may either hinder or encourage the frequency of occurrence
* others not mentioned may be relevant to specific natural hazards.

**16.**

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| The spatial distribution of a natural hazard is thoroughly and accurately described. A detailed and comprehensive description is given and accurate information is provided, of both one (1) biophysical process and one (1) human process that help explain the spatial distribution of a natural hazard. A wide range of appropriate supporting evidence and examples are used to develop and strengthen the description. The accurate use of relevant geographical terminology and concepts helps to develop a cohesive, concise and articulate answer, with well-developed sentences and paragraphs in an extended answer format. | 7-8 |
| The spatial distribution of a natural hazard is clearly and accurately described. An appropriate description is given and general, relatively accurate information is provided of both one (1) biophysical process and one (1) human process that help explain the spatial distribution of a natural hazard. A range of appropriate supporting evidence and examples are used to develop and strengthen the description. Relevant geographical terminology and concepts helps to develop a cohesive and detailed answer, with well-developed sentences and paragraphs in an extended answer format. | 5-6 |
| The spatial distribution of a natural hazard is described to a limited extent. A limited description is given and some generalised information is provided of both one (1) biophysical process and one (1) human process that help explain the spatial distribution of a natural hazard. Limited evidence is used to support statements and generalisations. There is limited use of geographical terminology and concepts in a largely unstructured response. | 3-4 |
| An attempt may be made to describe the spatial distribution of a natural hazard. A very basic description is given and little information is provided of one (1) biophysical process **or** one (1) human process that help explain the spatial distribution of a natural hazard. Insufficient evidence is presented in the description. There is limited or no use of geographical terminology and concepts, and poor literacy skills may contribute to a response that is difficult to understand. | 1-2 |
| No relevant attempt. | 0 |
| **TOTAL** | **8** |

**Question 31 (20 marks)**

1. Evaluate the environmental and economic impacts of a natural hazard you have studied in a developed country such as Australia and in a less developed country or region.

(12 marks)

**Syllabus:**

The environmental, economic and social impacts of the hazard in a developed country such as Australia compared with those in at least one less developed country or region.

**Key words:**

*Evaluate*: to ascertain the value or amount of; appraise carefully.

*Developed Country*: s a country that is considered to be strong in terms of its economy, infrastructure and economic base. The population of a developed country typically has a high standard of living as measured by GDP per capita, personal income levels, levels of employment and a number of social indices, particularly those related to education and health.

Less Developed Country: is a country that is considered to be lacking in terms of its economy, infrastructure and industrial base. The population of a less developed country has a relatively low standard of living as measured by low income levels, high unemployment, abundant poverty and a number of social indices, particularly those related to education and health.

**Teacher Notes:**

**17.**

Due to the scope of depth studies that can be used in this unit the teacher will have to use their discretion when deciding if the student’s answer supports the question.

**Note:** depending on interpretation and subsequent teaching by the teacher, some may see environmental as only pertaining to the physical/natural environment, whilst others may also accept impacts on the built/cultural environment.

**Environmental impacts** due to a natural hazard may refer to the following where relevant:

* destruction of ecosystems, habitats and biodiversity, (natural environment)
* water contamination/shortages, various forms of soil degradation, deforestation, coastal erosion, inundation, disease spread as a secondary impact (natural environment)
* destruction of homes, destruction of buildings, destruction of infrastructure and transport and utilities, (built/cultural environment)
* destruction of food crops, livestock and building associated with agriculture, (built/cultural environment)
* others as appropriate.

The impact, size and recovery from these potential environmental impacts will vary between developed countries and less developed countries.

**Economic impacts** of a natural hazard may refer to the following where relevant:

* destruction of homes, destruction of buildings related to employment and/or provision of goods and services
* destruction of infrastructure and transport and utilities and the cost of repair and replacement of the above structures
* cost of immediate relief efforts, rescue and ongoing medical responses
* costs of looting and rioting due to need and opportunism
* destruction of income earning food crops for domestic and international markets.
* loss of, or interruption to jobs, income and spending, domestically and internationally, leading to destabilisation of economy and government
* potential closure of borders (medical quarantine) and international transport (quarantine or physical damage)
* evacuation of foreign nationals and workers, leading to loss of workforce and expertise. Loss of confidence and international investment.

The impact, size and recovery from these potential economic impacts will vary between developed countries and less developed countries.

**In Evaluating (**ascertaining the value or amount of) **the impacts,** candidates should give **reasons** for variations in environmental and economic impact between developed and less developed countries. Factors may include:

* the existing knowledge relating to the hazard type
* hazard mitigation and reduction methods
* infrastructure base and the subsequent level of preparedness
* transport infrastructure effecting ability to evacuate people out and get emergency supplies in
* the levels of technological innovation evident
* health care infrastructure already limited, cannot cope with hazard event
* federal monetary reserves available to contribute towards response and recovery
* political systems and structures
* the nature and density of settlements
* the nature of agriculture and industry
* the economic base of the economy
* the social structure of the society
* close links between poverty and vulnerability to natural disasters.
* the overall level of vulnerability of the country/region.

**18.**

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| A clear and concise identification of a developed country and a less developed country or region is made. In relation to a clearly identified type of natural hazard, a detailed and comprehensive evaluation is given of the level of environmental and economic impacts of a natural hazard between the countries identified and the reasons for this. [A thorough response will necessarily describe various potential environmental and economic impacts for the particular locations and type of natural hazard being discussed.] A wide range of appropriate supporting evidence and examples are used to develop and strengthen the evaluation and demonstrate varying levels of environmental and economic impacts. The accurate use of relevant geographical terminology and concepts helps to develop a cohesive, concise and articulate answer, with well-developed sentences and paragraphs in an extended answer format. | 11-12 |
| A concise identification of a developed country and a less developed country or region is made. In relation to a clearly identified type of natural hazard, a detailed evaluation is given of the level of environmental and economic impacts of a natural hazard between the countries identified and the reasons for this. [A thorough response will necessarily describe various potential environmental and economic impacts for the particular locations and type of natural hazard being discussed.] A range of appropriate supporting evidence and examples are used to develop and strengthen the evaluation and demonstrate varying levels of environmental and economic impacts. Relevant geographical terminology and concepts help to develop a cohesive and detailed answer, with well-developed sentences and paragraphs in an extended answer format. | 9-10 |
| A concise identification of a developed country and a less developed country or region is made. In relation to a clearly identified type of natural hazard, an evaluation is given of the level of environmental and economic impacts of a natural hazard between the countries identified and the reasons for this. [A good response will describe a number of potential environmental and economic impacts for the particular locations and type of natural hazard being discussed.] A range of appropriate supporting evidence and examples are used to develop and strengthen the evaluation and demonstrate varying levels of environmental and economic impacts. Relevant geographical terminology and concepts helps to develop a cohesive answer, with adequate sentence and paragraph structures in an extended answer format. | 6-8 |
| Might identify a developed country and a less developed country or region is made, or may vaguely refer to the concepts. In relation to a natural hazard, a limited evaluation (more likely a description) is given of the level of environmental and economic impacts of a natural hazard between the countries identified and the reasons for this. [Response will describe one or two potential environmental and economic impacts for the particular locations and type of natural hazard being discussed.] Limited evidence is used to support statements and generalisations with little reference to varying levels of environmental and economic impacts. There is limited use of geographical terminology and concepts in a largely unstructured response. | 3-5 |
| Might identify a developed country and a less develop country or region is made, or may vaguely refer to the concepts, or not at all. In relation to a natural hazard, a very limited, or no, evaluation is given of the level of environmental and economic impacts of a natural hazard between the countries identified and the reasons for this. [Response may only describe one or two potential environmental and economic impacts for the type of natural hazard being discussed.] Insufficient evidence is used to support statements and generalisations with no reference to varying levels of environmental and economic impacts. There is limited or no use of geographical terminology and concepts and poor literacy skills may contribute to a response that is difficult to understand. | 1-2 |
| No relevant attempt. | 0 |
| **TOTAL** | **12** |

**Question 32 (20 marks)**

1. Describe the characteristics of a natural hazard you have studied by describing its typical magnitude, duration, frequency and probability.

(8 marks)

**19.**

**Syllabus:**

The magnitude, duration, frequency, probability and scale of spatial impact of the hazard.

**Key words:**

*Describe*: provide characteristics and features.

*Magnitude*: the strength and size of a hazard.

*Duration*: the length of time a hazard event occurs.

*Frequency*: the rate at which or number of times a hazard occurs over a particular period of time.

*Probability*: the likelihood of a hazard event occurring.

**Teacher Notes:**

Due to the scope of depth studies that can be used in this unit the teacher will have to use their discretion when deciding if the student’s answer supports the question.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| A detailed and comprehensive description is given and accurate information is provided on the magnitude, duration, frequency and probability of a natural hazard. A wide range of appropriate supporting evidence and examples are used to develop and strengthen the description. The accurate use of relevant geographical terminology and concepts helps to develop a cohesive, concise and articulate answer, with well-developed sentences and paragraphs in an extended answer format. | 7-8 |
| An appropriate description is given and general, relatively accurate information is provided on the magnitude, duration, frequency and probability of a natural hazard. A range of appropriate supporting evidence and examples are used to develop and strengthen the description. Relevant geographical terminology and concepts helps to develop a cohesive and detailed answer, with well-developed sentences and paragraphs in an extended answer format. | 5-6 |
| A limited description is given and some generalised information is provided for at least two or three of the listed characteristics of a natural hazard. Limited evidence is used to support statements and generalisations. There is limited use of geographical terminology and concepts in a largely unstructured response. | 3-4 |
| A very basic description is given and little information is provided for the characteristics listed in relation to a natural hazard. Alternatively, very brief descriptions (1 sentence each could be given for all the factors). Insufficient evidence is presented in the description. There is limited or no use of geographical terminology and concepts, and poor literacy skills may contribute to a response that is difficult to understand. | 1-2 |
| No relevant attempt. | 0 |
| **TOTAL** | **8** |

**20.**

**Question 32 (20 marks)**

1. Evaluate the physical and human factors that explain why some places and people are more vulnerable than others to the type of natural hazard you have studied.

(12 marks)

**Syllabus:**

The physical and human factors that explain why some places and people are more vulnerable to the hazard than others

**Key words:**

*Evaluate*: to ascertain the value or amount of; appraise carefully.

*Physical factors*: of nature, naturally occurring phenomena, processes and factors.

*Human factors*: actions, structures, conditions and processes of people.

*Vulnerability*: the susceptibility to harm or change.

**Teacher Notes:**

Due to the scope of depth studies that can be used in this unit, the teacher will have to use their discretion when deciding if the student’s answer supports the question.

**Physical factors** may relate to the following where relevant:

* location (physical and human factors influencing proximity)
* nature of natural environment (including atmospheric, geomorphic and/or hydrological conditions)
* magnitude
* duration
* frequency
* spatial extent
* probability.

**Human factors** may relate to the following where relevant:

* location of settlements
* quality of infrastructure (particularly transport, communication and utilities)
* build quality and density of settlements, building codes
* population density, level of urbanisation
* land use
* demographic profile
* level of economic development and wealth
* early detection and warning systems
* hazard and emergency management policies
* education and support structures.

A good answer will need to include a brief explanation of what is meant by the term vulnerability.

**Marking Key on next page**

**Marking Key:**

**21.**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| A clear and concise explanation of the concept of vulnerability is given as it applies to **both** people **and** places. In relation to a clearly identified type of natural hazard, a detailed and comprehensive evaluation of a number of physical **and** human factors influencing the vulnerability of both people and places is provided. [A thorough response will identify those factors that have the greatest influence on the level of vulnerability for the particular type of natural hazard being discussed.] A wide range of appropriate supporting evidence and examples are used to develop and strengthen the evaluation and demonstrate varying levels of vulnerability. The accurate use of relevant geographical terminology and concepts helps to develop a cohesive, concise and articulate answer, with well-developed sentences and paragraphs in an extended answer format. | 11-12 |
| A concise explanation of the concept of vulnerability is given as it applies to **both** people and places. In relation to a clearly identified type of natural hazard, a detailed evaluation of a number of physical **and** human factors influencing the vulnerability of both people and places is provided. [A thorough response will identify those factors that have the greatest influence on the level of vulnerability for the particular type of natural hazard being discussed.] A range of supporting evidence and examples are used to develop and expand the evaluation and demonstrate varying levels of vulnerability. Relevant geographical terminology and concepts help to develop a cohesive and detailed answer, with well-developed sentences and paragraphs in an extended answer format. | 9-10 |
| An explanation of the concept of vulnerability is given as it applies to **both** people and places. In relation to a clearly identified type of natural hazard, an appropriate evaluation of a number of physical **and** human factors influencing the vulnerability of both people and places is provided. [A good response will identify those factors that influence the level of vulnerability for the particular type of natural hazard being discussed.] Some supporting evidence is used to develop the evaluation with demonstrate levels of vulnerability. Relevant geographical terminology and concepts helps to develop a cohesive answer, with adequate sentence and paragraph structures in an extended answer format. | 6-8 |
| A limited explanation of the concept of vulnerability is given as it applies to people **and/or** places. In relation to an identified type of natural hazard, a limited evaluation of one or two physical **and/or** human factors influencing the vulnerability of people and places is provided. Limited evidence is used to support statements and generalisations with little reference to varying levels of vulnerability. There is limited use of geographical terminology and concepts in a largely unstructured response. | 3-5 |
| A very limited or no explanation of the concept of vulnerability is given. A type of natural hazard might be stated, and a very basic evaluation of a physical **and/or** human factor influencing the vulnerability of people and places is provided. Insufficient evidence is used to support statements and generalisations with no reference to varying levels of vulnerability. There is limited use of geographical terminology and concepts, and poor literacy skills may contribute to a response that is difficult to understand. | 1-2 |
| No relevant attempt. | 0 |
| **TOTAL** | **12** |

**22.**

**PART B: Depth Study 2 Answer either Question 33 or Question 34 20% (20 Marks)**

**Question 33 (20 marks)**

(a) Describe the spatial distribution and causes of an ecological hazard you have studied.

(8 marks)

**Syllabus:**

The nature and causes of the hazard

**Key word:**

*Describe*: provide characteristics and features.

**Teacher Notes:**

Due to the scope of depth studies that can be used in this unit the teacher will have to use their discretion when deciding if the student’s answer supports the question.

**Typical locations** can refer to:

* characteristics of regions where hazard typically occurs, could be climate characteristics, socio-economic characteristics, other relevant characteristics
* names of regions, countries, continents where the ecological hazard typically occurs.

**Causes of** can refer to:

* the source of the hazard
* how the hazard is generated
* physical factors and any significant human factors that may contribute to the occurrence of the hazard.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| A detailed and comprehensive description is given and accurate information is provided on both the typical locations and causes of an ecological hazard. A wide range of appropriate supporting evidence and examples are used to develop and strengthen the description. The accurate use of relevant geographical terminology and concepts helps to develop a cohesive, concise and articulate answer, with well-developed sentences and paragraphs in an extended answer format. | 7-8 |
| An appropriate description is given and general, relatively accurate information is provided on both the typical locations and causes of an ecological hazard. A range of appropriate supporting evidence and examples are used to develop and strengthen the description. Relevant geographical terminology and concepts helps to develop a cohesive and detailed answer, with well-developed sentences and paragraphs in an extended answer format. | 5-6 |
| A limited description is given and some generalised information is provided on both the typical locations and causes of an ecological hazard. Limited evidence is used to support statements and generalisations. There is limited use of geographical terminology and concepts in a largely unstructured response. | 3-4 |
| A very basic description is given and little information is provided on the typical locations **or** causes of an ecological hazard. Insufficient evidence is presented in the description. There is limited or no use of geographical terminology and concepts, and poor literacy skills may contribute to a response that is difficult to understand. | 1-2 |
| No relevant attempt. | 0 |
| **TOTAL** | **8** |

**23.**

**Question 33 (20 marks)**

(b) Evaluate the physical and human factors that explain why some places and people are more vulnerable than others to an ecological hazard you have studied.

(12 marks)

**Syllabus:**

The physical and human factors that explain why some places and people are more vulnerable to the hazard than others.

**Key words:**

*Evaluate*: to ascertain the value or amount of; appraise carefully.

*Physical factors*: of nature, naturally occurring phenomena, processes and factors.

*Human factors*: actions, structures, conditions and processes of people.

*Vulnerability*: the susceptibility to harm or change.

**Teacher Notes:**

Due to the scope of depth studies that can be used in this unit, the teacher will have to use their discretion when deciding if the student’s answer supports the question.

**Physical factors** may relate to the following where relevant:

* location (physical and human factors influencing proximity)
* nature of natural environment, atmospheric conditions, surface eater and drainage
* magnitude
* duration
* frequency
* spatial extent
* probability.

**Human factors** may relate to the following where relevant:

* location of settlements
* quality of infrastructure (particularly transport, communication and utilities)
* build quality and density of settlements, building codes
* population density, level of urbanisation
* land use
* demographic profile
* level of economic development and wealth
* early detection and warning systems
* hazard and emergency management policies
* education and support structures
* medical supplies and knowledge.

A good answer will need to include a brief explanation of what is meant by the term vulnerability.

**Marking Key on next page**

**24.**

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| A clear and concise explanation of the concept of vulnerability is given as it applies to **both** people and places. In relation to a clearly identified type of ecological hazard, a detailed and comprehensive evaluation of a number of physical **and** human factors influencing the vulnerability of both people and places is provided. A thorough response will identify those factors that have the greatest influence on the level of vulnerability for the particular type of ecological hazard being discussed. A wide range of appropriate supporting evidence and examples are used to develop and strengthen the evaluation and demonstrate varying levels of vulnerability. The accurate use of relevant geographical terminology and concepts helps to develop a cohesive, concise and articulate answer, with well-developed sentences and paragraphs in an extended answer format. | 11-12 |
| A concise explanation of the concept of vulnerability is given as it applies to **both** people and places. In relation to a clearly identified type of ecological hazard, a detailed evaluation of a number of physical **and** human factors influencing the vulnerability of both people and places is provided. A thorough response will identify those factors that have the greatest influence on the level of vulnerability for the particular type of ecological hazard being discussed. A range of supporting evidence and examples are used to develop and expand the evaluation and demonstrate varying levels of vulnerability. Relevant geographical terminology and concepts help to develop a cohesive and detailed answer, with well-developed sentences and paragraphs in an extended answer format. | 9-10 |
| An explanation of the concept of vulnerability is given as it applies to **both** people and places. In relation to a clearly identified type of ecological hazard, an appropriate evaluation of a number of physical **and** human factors influencing the vulnerability of both people and places is provided. A good response will identify those factors that influence the level of vulnerability for the particular type of ecological hazard being discussed. Some supporting evidence is used to develop the evaluation with demonstrate levels of vulnerability. Relevant geographical terminology and concepts helps to develop a cohesive answer, with adequate sentence and paragraph structures in an extended answer format. | 6-8 |
| A limited explanation of the concept of vulnerability is given as it applies to people **and/or** places. In relation to an identified type of ecological hazard, a limited evaluation of one or two physical **and/or** human factors influencing the vulnerability of people and places is provided. Limited evidence is used to support statements and generalisations with little reference to varying levels of vulnerability. There is limited use of geographical terminology and concepts in a largely unstructured response. | 3-5 |
| A very limited or no explanation of the concept of vulnerability is given. A type of ecological hazard might be stated, and a very basic evaluation of a physical **and/or** human factor influencing the vulnerability of people and places is provided. Insufficient evidence is used to support statements and generalisations with no reference to varying levels of vulnerability. There is limited use of geographical terminology and concepts, and poor literacy skills may contribute to a response that is difficult to understand. | 1-2 |
| No relevant attempt. | 0 |
| **TOTAL** | **12** |

**Question 34 (20 marks)**

1. Describe the spatial distribution of an ecological hazard you have studied and how **one (1)** biophysical process and **one (1)** human process has influenced this distribution.

(8 marks)

**25.**

**Syllabus:**

The spatial and temporal distribution of the hazard, and how an understanding of biophysical and human processes can be used to explain the patterns that are identified.

**Key words:**

*Describe*: provide characteristics and features.

*Spatial distribution*: the arrangement of geographical phenomena or activities across the earth’s surface; the location of features of a place; how features are arranged across the surface of the earth.

*Biophysical process*: the atmospheric, biological, chemical and physical processes that take place in the lithosphere, hydrosphere, atmosphere and biosphere.

*Human process (in the context of hazards)*: actions taken by individuals or communities, relating to settlement, livlihood and lifestyle, which inadvertantly may contribute to a hazard event occuring.

**Teacher Notes:**

Due to the scope of depth studies that can be used in this unit the teacher will have to use their discretion when deciding if the student’s answer supports the question.

**Spatial distribution** of the ecological hazard should include where the hazard occurs and the patterns associated with this distribution.

**Note:** processes should **relate to spatial distribution**, NOT vulnerability, magnitude or impact.

**Biophysical processes** may include the following where relevant: atmospheric process, patterns and conditions associated with occurrence of the hazard, such as rainfall, winds and temperature. Components of the water cycle and surface water conditions, drainage patterns and characteristics. The nature of, distribution of, and variations in ecosystem components such as soil and vegetation types. These may influence habitat and food availability for some components of ecological hazards. Others not mentioned may be relevant to specific ecological hazards.

**Human processes** may include the following where relevant: Nature and location of human settlements and structures. Activities associated with and the nature of agricultural practices. Activities associated with and the nature of mineral extraction practices. Water catchment management and structures associated with water storage, distribution and power generation. Management practices associated with forest reserves and bushland areas. Specific structures built along coastlines. Pre-emptive programs and processes that may either hinder or encourage the frequency of occurrence. General level of knowledge and understanding of the hazard. Access to preventative medical supplies. Others not mentioned may be relevant to specific ecological hazards.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| The spatial distribution of a natural hazard is thoroughly and accurately described. A detailed and comprehensive description is given and accurate information is provided, of both one (1) biophysical process and one (1) human process that help explain the spatial distribution of an ecological hazard. A wide range of appropriate supporting evidence and examples are used to develop and strengthen the description. The accurate use of relevant geographical terminology and concepts helps to develop a cohesive, concise and articulate answer, with well-developed sentences and paragraphs in an extended answer format. | 7-8 |
| The spatial distribution of an ecological hazard is clearly and accurately described. An appropriate description is given and general, relatively accurate information is provided of both one (1) biophysical process and one (1) human process that help explain the spatial distribution of an ecological hazard. A range of appropriate supporting evidence and examples are used to develop and strengthen the description. Relevant geographical terminology and concepts helps to develop a cohesive and detailed answer, with well-developed sentences and paragraphs in an extended answer format. | 5-6 |
| The spatial distribution of an ecological hazard is described to a limited extent. A limited description is given and some generalised information is provided of both one (1) biophysical process and one (1) human process that help explain the spatial distribution of an ecological hazard. Limited evidence is used to support statements and generalisations. There is limited use of geographical terminology and concepts in a largely unstructured response. | 3-4 |
| An attempt may be made to describe the spatial distribution of an ecological hazard. A very basic description is given and little information is provided of one (1) biophysical process **or** one (1) human process that help explain the spatial distribution of an ecological hazard. Insufficient evidence is presented in the description. There is limited or no use of geographical terminology and concepts, and poor literacy skills may contribute to a response that is difficult to understand. | 1-2 |
| No relevant attempt. | 0 |
| **TOTAL** | **8** |

**26.**

**Question 34 (20 marks)**

(b) Evaluate the extent to which human activities can intensify the impacts of an ecological hazard you have studied.

(12 marks)

**Syllabus:**

The means by which the activities of people can intensify the impacts of the hazard, such as:

* deliberate or accidental introduction of foreign plant or animal species to natural ecosystems
* global transport systems, human settlement and agriculture facilitating the spread of infectious diseases.

**Key word:**

*Evaluate*: to ascertain the value or amount of; appraise carefully.

**Teacher Notes:**

Due to the scope of depth studies that can be used in this unit the teacher will have to use their discretion when deciding if the student’s answer supports the question.

Students will need to clearly identify and discuss the nature of their chosen ecological hazard.

A good answer must **evaluate** how human activities can **intensify the impacts**, in relation to their chosen ecological hazard.

**Human activities** may include the following where relevant:

* Nature and location of human settlements - Materials used in construction of associated buildings and structures. Construction by-laws. Density of human settlement. Increasing population density and urbanisation. Location in relation to aspects of the physical environment and climate characteristics that may intensify the impact of the hazard.
* The quality of infrastructure and utility supplies – water supply infrastructure (collection, storage, distribution), water treatment, sewage infrastructure/plants, storm water drainage, transport infrastructure, power supply infrastructure.
* The quality of emergency response and medical infrastructure, knowledge and supplies.
* General population’s education and knowledge of potential causes and symptoms associated with the ecological hazard. Understanding of hygiene, food handling and safe work practices that would limit the spread and impact of the chosen hazard.

**27.**

* The movement of foreign nationals, tourists and workers.
* Activities associated with and the nature of agricultural practices – such as clearing of land, irrigation infrastructure and practices, alteration to microclimate, use of chemicals, introduction of foreign species, which may act as vectors.
* Activities associated with and the nature of mineral extraction practices – such as clearing of land, water management practices, alteration to microclimate, use of chemicals.
* Management practices associated with forest reserves and bushland areas.
* Others not mentioned may be relevant to specific ecological hazards.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| A clear and concise description is given relating to the type and nature of the ecological hazard being discussed. In an integrated format, a detailed evaluation of how human activities can intensify the impact of an ecological hazard is presented, where both the human activities plus the intensity and nature of the impacts are comprehensively evaluated. A wide range of appropriate supporting evidence is used to develop and strengthen the discussion. The accurate use of relevant geographical terminology and concepts helps to develop a cohesive, concise and articulate answer, with well-developed sentences and paragraphs in an extended answer. | 11-12 |
| A concise description is given relating to the type and nature of the ecological hazard being discussed. In an integrated format, a detailed evaluation of how human activities can intensify the impact of an ecological hazard is presented, where both the human activities plus the intensity of the impacts are assessed. A range of appropriate supporting evidence is used to develop and strengthen the discussion. The accurate use of relevant geographical terminology and concepts help to develop a cohesive and detailed answer, with well-developed sentences and paragraphs in an extended answer. | 9-10 |
| A description is given relating to the type and nature of the ecological hazard being discussed. In an integrated format, an evaluation of human how activities can intensify the impact of an ecological hazard is presented. Some evaluation of both the human activities plus the intensity of the impacts are made. Some supporting evidence is used to develop and strengthen the discussion. Relevant geographical terminology and concepts helps to develop a cohesive answer, with adequate sentence and paragraph structures in an extended answer format. | 6-8 |
| A limited description is given relating to the type and nature of the ecological hazard being discussed. Information, lacking in detail, about how human activities can intensify the impact of an ecological hazard is presented. Little evaluation of the human activities plus the intensity of the impacts are made. Limited evidence is used to support statements and generalisations. There is limited use of geographical terminology and concepts in a largely unstructured response. | 3-5 |
| A very limited, if any, description is given relating to the type and nature of the ecological hazard being discussed. Answer may just refer to ecological hazards in general. Very limited Information about how human activities can intensify the impact of an ecological hazard is presented. Little or no evaluation of the human activities plus the intensity of the impacts are made. Insufficient evidence is used to support statements and generalisations. There is limited use of geographical terminology and concepts, and poor literacy skills may contribute to a response that is difficult to understand. | 1-2 |
| No relevant attempt. | 0 |
| **TOTAL** | **12** |

**End of Section Three**

**End of Questions**