

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

**Year 11 ATAR GEOGRAPHY**

**Unit 1**

**Semester 1, 2018**

**MARKING GUIDE**

**for**

**Teacher Use 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)**

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

|  |  |  |  |
| --- | --- | --- | --- |
| **Qu** | **Ans** | **Description** | |
| 1 | (b) | Comment | The scale of the map in Source 1 is shown as a ratio above the line scale 1:50 000. At this scale, one centimetre on the map represents 50 000 centimetres on the ground, which is the same as 500m. |
| **Syllabus** | Interpret and express scale in written, linear and ratio (representative fraction) formats, and convert scale from one format to another. |
| 2 | (a) | Comment | A quick scan of the map will reveal the numerical value of contour lines. Also written on the map under the line scale! |
| **Syllabus** | Interpret marginal information represented on maps (title, conventional signs contained in the legend, north point, numerical and linear scale)  Interpret relief on a map using contours and height information, to describe the steepness and shape of a slope, and calculate the average gradient |
| 3 | (d) | Comment | Students will need to scan the map and interpret the contour lines to find the summits of hills and associated spot heights/trig stations. Highest point is Rangitoto Peak at GR 978784. |
| **Syllabus** | Interpret relief on a map using contours and height information, to describe the steepness and shape of a slope, and calculate the average gradient |
| 4 | (c) | Comment | By adding up the whole squares (30) and par squares (10) covered by the lake the area is approximately 40 kilometres Therefore (c) is the closest answer. |
| **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 Motutara Point as 38°08’ S and 176°16’ E, (a). (c) and (d) have latitude and longitude values listed in incorrect order, (b) and (c) also confuse the eastings values for the minutes of the longitude figure and are therefore incorrect. |
| **Syllabus** | Establish position on a map using alphanumeric grid coordinates, easting and northings, four figure area references, six figure grid reference and latitude and longitude expressed in degrees and minutes. |
| 6 | (d) | Comment | The direction is closest to North West, eliminating (a) and (b). The direction NW is 315°, the actual direction is a little less than NW so 310° is the closest/most accurate answer (d). (c) is too close to directly west. |
| **Syllabus** | Establish direction on a map using general compass directions and bearings. |
| 7 | (c) | Comment | The terms given are commonly used to describe relief, steepness and shape of land. The slope falls from 700 metres to 500 metres in less than a kilometre and the contour lines are closer to each other in the upper part of the slope. |
| **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. |
| 8 | (a) | Comment | Students will need to find the symbol on the map extending between the two grid references and then find the symbol and feature on the map key. |
| **Syllabus** | Interpret marginal information represented on maps (title, conventional signs contained in the legend, north point, numerical and linear scale) |
| 9 | (b) | Comment | The distance between the two points given is approximately 19 cm, representing 9.5 km on a map with a scale of 1:50 000. Distance (9.5) divided by speed (95) multiplied by time (60 minutes)) = Time Taken (6 minutes). Can also be worked out by cross multiplication method. If distance measured by students is slightly longer or shorter than 9.5 km, answer should still be closest to 6 minutes. Some students will immediately recognise that as 95 km is to 60 minutes, 9.5 km is to 6 minutes. |
| **Syllabus** | Apply the map scale to basic calculations to determine time, speed, distance and area. |
| 10 | (d) | Comment | Features on Source 2 (satellite image) appear larger and in more detail than they do on Source 1 (topographic map). Therefore, the scale of the satellite image is larger than that of the topographic map, meaning that only alternative (d) can be correct. Students who have difficulty with this concept can be reminded that they should pick the same feature found on both the map and photograph and measure their size. |
| **Syllabus** | Interpret the difference in scale between a photograph [satellite image] and a topographic map of the same place. |

|  |  |  |  |
| --- | --- | --- | --- |
| **Qu** | **Ans** | **Description** | |
| 11 | (b) | Comment | A natural or physical feature is a feature that naturally occurs. The distinct feature located at ‘**A**’ is sand and mud, identifiable due to the distinct colouring on photo coinciding with the symbol on the map and description in map key. |
| **Syllabus** | Identify and describe **natural** and cultural features and their patterns on the Earth’s surface using **aerial photographs** (**vertical** and oblique), radar imagery and satellite imagery (Landsat, weather satellites and Google Earth).  Use remote sensing products as an aid to interpreting natural and cultural features shown on topographic maps.  Identify and interpret natural features and cultural features on a map.  Interpret marginal information represented on maps (… conventional signs …) |
| 12 | (d) | Comment | A cultural feature is a human made feature. The distinct feature indicated by ‘**B**’ is a water treatment plant, identifiable on both the photo and map by its relative location to the ‘Racecourse’ and the associated buildings and the labeling at correct location on the map. |
| **Syllabus** | Identify and describe **natural** and cultural features and their patterns on the Earth’s surface using **aerial photographs** (**vertical** and oblique), radar imagery and satellite imagery (Landsat, weather satellites and Google Earth).  Use remote sensing products as an aid to interpreting natural and cultural features shown on topographic maps.  Identify and interpret natural features and cultural features on a map. |
| 13 | (c) | Comment | Mokoia Island in the background is a good reference point for the students to ascertain that the photograph was taken facing a North-East direction. |
| **Syllabus** | Establish direction on a map using general compass directions and bearings.  Determine direction on remote sensing products. |
| 14 | (d) | Comment | The key to a definition of hazards is that they have the **potential** to impact negatively. (b) and (c) are both definitive in their impacts and are better definitions of a disaster. (a) does not include potential or impacts. |
| **Syllabus** | The concept of hazard geography. |
| 15 | (a) | Comment | The hazards types of Earthquakes, Tropical windstorms and Active volcanoes as listed and described in the key are all most highly represented in the areas described in (a). |
| **Syllabus** | The spatial and temporal distribution, … of natural and ecological hazards at a global scale.  Identify and interpret a variety of topographic and thematic maps.  Identify and apply data from different types of statistical maps (isopleth/isoline maps, chloropleth maps, proportional circle maps, overlay and dot distribution maps). |
| 16 | (a) | Comment | Storms, weather related-other, droughts and most floods are typically classified as atmospheric hazards. |
| **Syllabus** | Classification of natural hazards (atmospheric, hydrological and geomorphic)  The spatial and temporal distribution, … 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; climate graphs; pie graphs; flowcharts and population pyramids. |
| 17 | (d) | Comment | Simple definition based on SCSA course Glossary statement. |
| **Syllabus** | The spatial and temporal distribution, … of natural and ecological hazards at a global scale. |
| 18 | (b) | Comment | Simple definition based on SCSA course Glossary statement. |
| **Syllabus** | The concepts of risk and hazard management as applied to natural and ecological hazards. |
| 19 | (d) | Comment | Simple definition based on terminology in the SCSA course. |
| **Syllabus** | The spatial and temporal distribution, magnitude, duration, frequency, probability and scale of spatial impact of natural and ecological hazards at a global scale. |
| 20 | (c) | Comment | (c) contains a list of remote sensing technologies as referred to in the syllabus. Surveys (a), digital photography (b) and weather instruments (d) are not necessary remote devices. |
| **Syllabus** | The role of spatial technologies in the study of natural and ecological hazards.  **Remote sensing skills** (use of remote sensing products, such as ground level photographs, aerial photographs, radar imagery and satellite imagery) |

1. = 5 (b) = 4 (c) = 4 (d) = 7

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

Refer to **Source 1**: Rotorua topographic map 2016 to answer questions 21 to 23.

**Question 21 (4 marks)**

Describe **two** **(2)** characteristics of the site and **two (2)** characteristics of the situation of the settlements at Mãtaikõtare/Te Ngae (ARs 9180 and AR 9280).

**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 settlement, not areas 5, 10 or more kilometres away (10 or more cm)! Surrounding natural vegetation does provide evidence of vegetation type before clearing. S ite features may include:

* Topography – height, gradient, slope - e.g. 280 – 300 m asl, fairly flat, sloping to the west.
* Landforms – e.g. floodplain, valley - e.g. small valley to flat plain adjacent to lake.
* Drainage – rivers, lakes, swamps - e.g. on shore of Lake Rotorua, dissected by perennial streams – Waiohewa Stream.
* Vegetation – evidence of original natural vegetation in the area - e.g. ‘scrub’ (from key).
* Soils – e.g. alluvial associated with the stream/lake.

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 full sentences, using appropriate geographical language. Can include:

* Distance and Direction from other settlements of major features - e.g. Approximately 9 km north east of Rotorua, 4 km west of Lake Rotokawau, 3-4 km east of Mokoia Island.
* Latitude and Longitude - e.g. 38° 05’ S 176° 20’ E.
* Location in relation to or on major transport routes - e.g. Corner of Te Ngae Road (State Highway 30) and two-lane road heading to the east.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Correctly describes any **one (1)** site characteristic (e.g. elevation, natural drainage, natural vegetation, slope, soil). | 1 |
| Correctly describes any **one (1) other** site characteristic (e.g. elevation, natural drainage, natural vegetation, slope, 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** |

**Question 22 (2 marks)**

Describe the relationship between urban settlements and topography on the Rotorua topographic map.

**Syllabus:**

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

**Key word:**

Describe: Provide characteristics and features.

**Teacher notes:**

Urban settlements shown on the map are generally found on areas of flatter land on the banks of Lake Rotorua. This land is usually below 400m with most being below 300m - e.g. AR 8975, AR 8473, AR 8180 – many more examples could be provided. Where the land is hillier and steeper, as indicated by the numerous contour lines, virtually no urban settlement and associated transport links are found - e.g. AR 9473, AR 9071, AR 8076 – many more examples could be provided.

A good answer will use Grid References or Area References to highlight examples of the types of patterns and relationships identified. Better answers will also integrate the two elements listed in the question, (urban settlements and topography) highlighting the **interrelationships** between them, rather than simply listing the locations or characteristics of each component.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Thoroughly describes how urban settlements and topography are interrelated to each other to form the patterns observed, Uses Area Reference and Grid References to locate examples of patterns mentioned. Full sentences are used. | 2 |
| States how urban settlements and topography are interrelated to each other to form the patterns observed. Does not use Area Reference and Grid References to locate examples of patterns mentioned. **OR**  Simply states where urban settlements are located and states where various variations in topography are seen but does not state their interrelationship. | 1 |
| **TOTAL** | **2** |

**Question 23 (4 marks)**

Identify and give the location of **two (2)** pieces of evidence in Source 1 that indicate the area covered by the map is an active geothermal region.

**Syllabus:**

Identify different relief features (landforms, including hills, valleys, plains, spurs, ridges, escarpments, saddles, cliffs).

Examples of natural hazards, including storms, cyclones, hurricanes, typhoons, tornadoes, frosts, droughts, flooding, earthquakes, volcanoes and landslides.

**Key word:**

Identify: Recognise and name

Locate: To indicate the position of

**Teacher Notes:**

Students do not have to have studied volcanism in their depth study to answer this question as they should have some knowledge of volcanic and geomorphic activity from the overview syllabus dot points and the question is largely a mapping question requiring them to find and locate information and features on the map. Evidence could include:

* AR 8475 states ‘thermal area’.
* AR 8471 states ‘thermal area’
* ‘Sulpher Point’ at AR 8674
* Lake Rotokawau at AR 9680 may be identified as a volcanic crater.
* Te Whekau Lagoon at AR 9670 may be identified as a volcanic crater.
* Students may state that Mokoia Island (AR 8880) is a volcano due to its shape and location. This is an acceptable conclusion (It is in fact a lava dome).

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Correctly names (I mark) and locates with a Grid or Area reference (1 mark) a feature which is evidence of geothermal activity in the map area. | 2 |
| Correctly names (I mark) and locates with a Grid or Area reference (1 mark) a second feature which is evidence of geothermal activity in the map area. Can be same type of feature. | 2 |
| **TOTAL** | **4** |

Refer to **Source 1**: Rotorua topographic map 2016 and **Source 2**: Rotorua satellite image 2018 to answer question 24.

**Question 24 (3 marks)**

Identify the direction the town of Rotorua is most likely to grow in the future. Describe evidence from **Source 1** and **Source 2** to support your answer.

**Syllabus:**

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

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.

**Key words:**

Identify: Recognise and name.

Describe: Provide characteristics and features

**Teacher Notes:**

Urban Settlement, such as Rotorua, is found on predominantly flat land between 280 and 320 m on the Rotorua topographic map. Areas such as this can be found to the east of the centre of the Rotorua townsite along Te Ngae Road and Vaughan Road. Students could identify/locate and describe such areas of flat land at ARs: 8774, 8773, 8874, 89749074 and 9073 on Source 1. On Source 2 they may identify that these areas of flat land are largely cleared and adjacent to existing housing making these areas a logical location for the future growth of Rotorua. Almost all other areas shown on the map sheet appear to be too steep or heavily vegetated for easy construction of buildings.

If other areas are identified by students, teachers will need to use their own discretion in deciding their suitability.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Correctly identifies the direction the town of Rotorua is most likely to grow in the future. | 1 |
| Describes **one (1)** piece of evidence or feature found on the **topographic map** that supports the stated direction of growth. Correctly locates the evidence or feature by using a Grid or Area Reference, road name or distance and direction. | 1 |
| Describes **one (1)** piece of evidence or feature found on the **satellite image** that supports the stated direction of growth. Correctly locates the evidence or feature by using a Grid or Area Reference, road name or distance and direction. | 1 |
| **TOTAL** | **3** |

**Question 25 (3 marks)**

Define the following terms and provide an example of each:

* Geomorphic hazards
* Pandemics
* Plant and animal invasions

**Syllabus:**

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

Examples of natural hazards, including storms, cyclones, hurricanes, typhoons, tornadoes, frosts, droughts, flooding, earthquakes, volcanoes and landslides.

Examples of 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 word:**

Define: provide characteristics and features.

**Teacher notes:**

**Geomorphic hazards:** hazards caused by the movement of the earths surface and/or within the earth’s crust - e.g. earthquakes, volcanic eruptions, landslides, tsunamis.

**Pandemics:** the spread of an infectious disease on a very large, typically global scale - e.g. Bird Flu, Bubonic Plague.

**Plant and animal invasions:** a plant, fungus, or animal species that is not native to a specific location (an introduced species), and which has a tendency to spread to a degree believed to cause damage to the environment, human economy or human health. E.g. Rabbits. Could also be a plague of an unusually large number of insects or animals infesting a place and causing damage - e.g. Locusts.

**Marking Key:**

|  |  |
| --- | --- |
| **3 x 1 marks Description** | **Marks** |
| A clear and correct definition is given, with an example of each type of hazard. | 3 |
| **TOTAL** | **3** |

Refer to **Source 5** to answer questions 26 and 27.

**Question 26 (4 marks)**

Describe how any **two (2)** factors in the green column, ‘Vulnerability Underlying Causes’, could increase the level of risk associated with a ‘Hazard Trigger Event’ listed in the fourth column.

**Syllabus:**

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

Use systems and flow diagrams to organise thinking about relationships.

**Key word:**

Describe: provide characteristics and features.

**Glossary:**

Vulnerability: The susceptibility to harm or change.

Risk: The level of exposure to injury or loss.

**Teacher Notes:**

Students should clearly identify in their answer booklet which underlying cause they are referring to. For each chosen underlying cause students should describe how this factor increases the level of risk associated with a specific hazard trigger event identified from the last column. Non-specific, general answers should receive half marks or less.

Look for terminology in **Source 5** in the student response.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| **2 x 2 marks** | **4** |
| Correctly describes how the factor identified would increase the level of risk (that is, will heighten the impact of a hazard, thus causing a disaster to occur) for a trigger event listed in the source. Uses correct geographic terminology and writes in sentences. | 2 |
| Limited description of how the factor identified would increase the level of risk (that is, will heighten the impact of a hazard, thus causing a disaster to occur) for a trigger event listed in the source. May not link their answer to a specific trigger event. May use limited geographic terminology and poor sentence structure. | 1 |
| Poor description that makes little sense. Does not indicate how risk will increase for a chosen trigger event. | 0 |
| **TOTAL** | **4** |

Refer to **Source 5** to answer questions 26 and 27

**Question 27 (4 marks)**

Describe how any two factors in the blue column “Vulnerability Unsafe Conditions’ could increase the level of risk associated with a ‘Hazard Trigger Event’ listed in the fourth column.

**Syllabus:**

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

Use systems and flow diagrams to organise thinking about relationships.

**Key word:**

Describe: provide characteristics and features.

**Glossary:**

Vulnerability: The susceptibility to harm or change

Risk: the level of exposure to injury or loss

**Teacher Notes:**

Students should clearly identify in their answer booklet which unsafe condition they are referring to. For each chosen unsafe condition students should describe how this factor increases the level of risk associated with a specific hazard trigger event identified from the last column. Non-specific, general answers should receive half marks or less.

Look for terminology in Source 5 in the student response.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| **2 x 2 marks** | **4** |
| Correctly describes how the factor identified would increase the level of risk (that is, will heighten the impact of a hazard, thus causing a disaster to occur) for a trigger event listed in the source. Uses correct geographic terminology and writes in sentences. | 2 |
| Limited description of how the factor identified would increase the level of risk (that is, will heighten the impact of a hazard, thus causing a disaster to occur) for a trigger event listed in the source. May not link their answer to a specific trigger event. May use limited geographic terminology and poor sentence structure. | 1 |
| Poor description that makes little sense. Does not indicate how risk will increase for a chosen trigger event. | 0 |
| **TOTAL** | **4** |

Refer to **Source 4**: World map of natural hazards and **Source 6**:Natural hazards and economic impacts 1995 - 2015 to answer Question 28.

**Question 28 (6 marks)**

Despite the Americas having a lower population than Asia, the economic impact by region of natural hazards from 1995 to 2015 has been higher. Identify and describe **two (2)** likely reasons why this has been the case.

**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; climate graphs; pie graphs; flowcharts and population pyramids.

**Key word:**

Identify: Recognise and name.

Describe: provide characteristics and features.

**Teacher Notes:**

A number of factors, mainly linked to the economic status and level of development of North America, contribute to the higher economic impact and damage identified in the Americas compared to Asia. Students could refer to factors such as:

* disruption to the high value manufacturing industries present and associated loss of income.
* GDP higher therefore impact is of a higher monetary value
* the costs of repair to highly developed settlements
* the costs of repair to highly developed communications and transport systems
* disruption to centralise and networked power supply and distribution systems
* disruption to and repair of other elements of infrastructure.

In contrast many areas of Asia are typically less developed and are developing countries and the value of repairs to infrastructure and monetary value of the impact on GDP will be less.

Teacher will have to use their discretion when deciding if the student’s answer supports the question.

**Marking Key:** A good answer will make reference to the Source.

|  |  |
| --- | --- |
| **Description** | **Marks** |
| **2 X 3 marks** | **6** |
| Correctly identifies a relevant reason/factor. Provides a concise and correct description of the reason, demonstrating an understanding of the nature of the countries and economies across the two regions. Refers to specific examples to strengthen their answer. Geographical terminology and full sentences are used. | 3 |
| Correctly identifies a relevant reason/factor. Provides a description of the reason, demonstrating some understanding of the nature of the countries and economies across the two regions. Refers to specific examples to strengthen their answer. May have some relevant geographical terminology and full sentences are used. | 2 |
| Reason/factor not very clear. Limited description of the reason, demonstrating poor understanding of the nature of the countries and economies across the two regions. Specific examples and geographical terminology not used. | 1 |
| **TOTAL** | **6** |

Refer to **Source 7** to answer Question 29.

**Question 29 (6 marks)**

1. Identify the differences that can be observed in the initial response and rescue efforts shown in Source 7a and Source 7b. (2 marks)

**Syllabus:**

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

**Key word:**

Identify: Recognise and name.

**Glossary:**

Response: to react to an event or action

Rescue: responsive actions aimed at saving life or prevention of injury during an incident or dangerous situation

**Teacher Notes:**

In Source 7a the approach appears less coordinated and more haphazard. Many local people, standing in the zone of destruction just looking and lending a hand. A few scattered individuals in high visibility vests. The response does not look very coordinated and little evidence of the application of any technological aids.

In Source 7b it appears that a ‘rescue team’ is in action. Rescuers are identified by different colour uniforms and labelling. Some form of rescue and transport apparatus is being used. Appears to be a more coordinated response.

**Marking Key**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Identifies what is taking place in each photograph and highlights the differences in each response. Links the differences to location and /or type of nation as identified in the sources. | 2 |
| Identifies what is taking place in each photograph. Fails to link to location of type of nation as identified in the sources. | 1 |
| **TOTAL** | **2** |

Refer to **Source 7** to answer Question 29.

**Question 29 (6 marks)**

(b) Explain how the differences observed in hazard management and response techniques could influence the level of vulnerability of people living in developing nations and developed nations. (4 marks)

**Syllabus:**

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

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

**Key word:**

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

**Glossary:**

**Response:** to react to an event or action **Vulnerability:** The susceptibility to harm or change

**Teacher Notes:**

Typically in developing countries hazard management and response techniques may be slower, hampered by poor communication and transport infrastructure, reliant on eye witness accounts and observations, involve less application of technologies that may assist in locating and rescuing those impacted, involve less central coordination of people and resources, involve rescuers with low levels of specific training, be hampered by limited medical supplies and be hampered by locals and others desperate to help or even exploiting the situation (such as looters). The opposite of the above conditions are typically found in more developed nations where infrastructure, trained personnel, coordination, control and the application of technologies are of a higher level.

Any of these differences described above can be used to explain why people living in developing nations will be more vulnerable to the risks associated with the type of hazard shown and hazards in general, leading to higher rates of injury and death. In contrast, people living in developed nations will have a higher chance of initial rescue and subsequent appropriate emergency services as required.

A good answer will make reference to, but not be restricted to, information in the Source**.**

**Marking Key**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Concisely and correctly explains how differences in hazard management and response techniques will influence the level of vulnerability of people living in developing and developed nations. Displays a correct understanding of the terms response and vulnerability as they relate to hazards. Refers to specific examples to strengthen their answer. Geographical terminology and full sentences are used. | 3-4 |
| Partly explains how differences in hazard management and response techniques will influence the level of vulnerability of people living in developing and developed nations. Displays some understanding of the terms response and vulnerability as they relate to hazards. No examples used to strengthen their answer. Geographical terminology limited and full sentences may not be used. | 1-2 |
| **TOTAL** | **4** |

**Question 30 (4 marks)**

Describe how **one (1)** example of a spatial technology may be used to study or monitor the occurrence of a natural hazard and how **one (1)** example of a spatial technology may be used to study or monitor the occurrence of an ecological hazard.

**Syllabus:**

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

**Key word:**

Describe: provide characteristics and features.

**Teacher Notes:**

Students will need to identify one natural hazard and a relevant spatial technology and one ecological hazard and a relevant spatial technology.

**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 or monitor 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 or monitor 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 or monitor 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 or monitor 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** |

**End of Section Two**

**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. With reference to a natural hazard that you have studied, describe the risks the natural hazard may present in relation to property, infrastructure and loss of life.

(8 marks)

**Syllabus:**

The nature of the risks to be managed, such as:

* loss of property/life
* effects on infrastructure, jobs and the economy
* the impact on physical and mental health.

**Key word:**

Describe: provide characteristics and features.

**Glossary:**

Risk: level of exposure to injury or loss.

Risk Management: preparedness, mitigation and/or prevention of a natural or ecological hazard.

**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. Candidates will need to describe the typical risks associated with their chosen natural hazard.

NOTE that the syllabus dot point says ‘such as’ therefore the list of examples is neither exclusive nor exhaustive. The way the word risk is used in this syllabus dot point appears to be equating risk with the nature of the potential impacts. As it is the second of a series of dot points introducing the natural hazard, (lower order concepts), the emphasis is taken to be on the nature of the risks or potential impacts, rather than their actual management, (higher order concept), which is covered in the last two dot points of the depth study.

**Risks, or impacts, to be managed may include:**

* physical destruction of property including homes, buildings, agricultural undertakings, industrial structures and businesses. Risks such as loss of property, impact on agriculture, loss of employment, jobs, and income.
* Infrastructure, such as water, power, gas and sanitation services, communication and transport services may be impacted. All may be impacted directly and cause subsequent risks due to factors such as contamination of water supplies and/or food sources.
* Human health impacts such as: physical injury leading to loss of life due to direct impact of the hazard and subsequent impacts on infrastructure such as water, sanitation and food supplies may lead to spread of disease and loss of life.

The nature of these risks will depend on the hazard type chosen.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Clearly identifies a natural hazard and describes the concept of risk as related to this hazard. A detailed and comprehensive description is given and accurate information is provided on the types of risks associated with the selected 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 |
| Identifies a natural hazard and describes the concept of risk as related to this hazard. An appropriate description is given and more general, but accurate information is provided on the types of risks associated with the selected 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 |
| Identifies a natural hazard. Describe the concept of risk in part. A limited description is given and some generalised information is provided on the types of risks associated with the selected 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 |
| May talk about natural hazards in general terms. A very basic description is given and little information is provided on the types of risks associated with a selected natural hazard. 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. Assess the means by which the activities of people can intensify the impacts of a natural hazard you have studied.

(12 marks)

**Syllabus:**

The means by which the activities of people can intensify the impacts of the hazard.

**Key word:**

Assess: make a judgement of value, quality, outcomes, results or size.

**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 natural hazard. A good answer will demonstrate understanding of the phrase ‘intensify the impacts of’ in relation to their chosen natural 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 impacts associated with the natural hazard.
* Activities associated with and the nature of agricultural practices – such as clearing of land, irrigation infrastructure and practices, alteration to microclimate.
* Activities associated with and the nature of mineral extraction practices – such as clearing of land, water management practices and alteration to microclimate.
* Management practices associated with forest reserves and bushland areas.
* Deforestation and land clearing.
* Others not mentioned may be relevant to specific natural hazards.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| A clear and concise description is given relating to the type and nature of the selected natural hazard being discussed. In an integrated format, detailed information about how human activities can intensify the impact of the natural hazard is presented, where both the human activities plus the intensity and nature of the impacts are comprehensively assessed. 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 selected natural hazard being discussed. In an integrated format, detailed information about how human activities can intensify the impact of the natural 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 helps 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 selected natural hazard being discussed. In an integrated format, information about how human activities can intensify the impact of the natural hazard is presented. Some assessment of both the human activities plus the intensity of the impacts are made. Some supporting evidence is used to develop and strengthen the discussion. Geographical terminology and concepts are applied to construct a response, which shows some detail, but may have difficulty articulating ideas. | 6-8 |
| A limited description is given relating to the type and nature of the selected natural hazard being discussed. Information, lacking in detail, about how human activities can intensify the impact of the natural hazard is presented. Little assessment 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 a selected natural hazard. Answer may just refer to natural hazards in general. Very limited Information about how human activities can intensify the impact of a selected natural hazard is presented. Little or no assessment 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** |

**Question 32 (20 marks)**

1. Describe the magnitude, duration, frequency and scale of spatial impact of a natural

hazard you have studied.

(8 marks)

**Syllabus:**

The magnitude, duration, frequency, probability and scale of spatial impact 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. Answers must address the:

* typical or range of magnitudes of the hazard
* typical duration of the hazard
* typical frequency of the hazard
* scale of spatial impact of the hazard (where it and its impacts typically occurs).

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| A detailed and comprehensive description is given and accurate information is provided for all four of the factors listed in relation to 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 more general, but accurate information is provided for all four of the factors listed in relation to 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 three of the factors listed in relation to 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 at least two of the factors listed in relation to a natural hazard. Alternatively, very brief descriptions (1 sentence each could be given for all four 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** |

**Question 32 (20 marks)**

(b)Account for the variations in environmental and social impacts of a natural hazard between 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 word:**

Account for: State reasons for, report on.

**Glossary:**

Developed Country: is 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 an health.

**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.

**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.

**Social Impacts** due to a natural hazard may refer to the following where relevant:

* injury and loss of life, short-term and long-term health impacts
* secondary health impacts due to impact on utilities, especially water and sewerage
* loss of, or interruption to jobs, income and spending
* loss of housing and adequate shelter
* social isolation due to relocation and separation
* breakdown of law and order, inhibits recovery and may led to political instability
* decreased access to education may occur due to damage to facilities or inaccessibility
* others as appropriate.

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

**Reasons** for variations in environmental and social impact between developed and less developed countries can be related to:

* 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.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| A clear and concise identification of a developed country and a less develop country or region is made. In relation to a clearly identified type of natural hazard, a detailed and comprehensive account is given of the various reasons for the differences in the level of environmental and social impacts of a natural hazard between the countries identified. (A thorough response will necessarily describe various potential environmental and social 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 account and demonstrate varying levels of environmental and social 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 develop country or region is made. In relation to a clearly identified type of natural hazard, a detailed account is given of the various reasons for the differences in the level of environmental and social impacts of a natural hazard between the countries identified. (A thorough response will necessarily describe various potential environmental and social 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 account and demonstrate varying levels of environmental and social impact. 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 develop country or region is made. In relation to a clearly identified type of natural hazard, an account is given of the various reasons for the differences in the level of environmental and social impacts of a natural hazard between the countries identified. (A good response will describe a number of potential 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 account and demonstrate varying levels of environmental and social impacts. Relevant geographical terminology and concepts help to develop a cohesive and answer, with well-developed sentences and paragraphs in an extended answer format. | 6-8 |
| Might identify a developed country and a less develop country or region, or may vaguely refer to the concepts. In relation to a natural hazard, a limited account is given of the reasons for the differences in the level of environmental and social impacts of a natural hazard between the countries identified. (Response will describe one or two potential environmental and social impacts for the particular locations and natural hazard being discussed **or** will describe the impacts in some detail but fail to account for the variations at all.) Limited evidence is used to support statements and generalisations with little reference to varying levels of environmental and social 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, or may vaguely refer to the concepts, or not at all. In relation to a natural hazard, a very limited, or no, account is given of the reasons for the differences in the level of environmental and social impacts of a natural hazard. (Response may describe one or two potential environmental and social impacts for the natural hazard being discussed **or** will very briefly describe the impacts but fail to account for the variations at all.) Insufficient evidence is used to support statements and generalisations with no reference to varying levels of environmental and social 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** |

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

**Question 33 (20 marks)**

1. Describe the nature 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.

**Nature of** can refer to:

* When and where the hazard occurs – frequency, magnitude, duration and probability.
* Classification or type of ecological hazard hazard (biological, diseases/pandemics, plant and animal invasions, chemical).
* Nature of or types of impacts – scale of impact, damage to property, damage to environment, injury and deaths.

**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 nature (distinguishing characteristics of) 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 nature (distinguishing characteristics of) 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 nature (distinguishing characteristics of) 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 nature (distinguishing characteristics of) **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 |
| **TOTAL** | **8** |

**Question 33 (20 marks)**

1. Evaluate the physical and human factors that help explain why some places and people are more vulnerable than others to a type of ecological hazard that 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 word:**

Evaluate: To ascertain the value or amount of: appraise carefully

Vulnerability: The susceptibility to harm or change

Physical factors: Of nature, naturally occurring phenomena, processes and factors

Human factors: Actions, structures, conditions and processes of people

**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:

* nature of the location (physical and human factors influence proximity)
* nature of natural environment including climate, surface water and drainage
* magnitude
* duration
* spatial extent
* frequency
* 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
* ability of early detection
* medical supplies and knowledge
* hazard and emergency management policies, education and support structures.

**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. Geographical terminology and concepts are applied to construct a response that shows some detail, but may have difficulty articulating ideas. | 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 how **one (1)** biophysical process and **one (1)** human process can be used to explain the spatial and temporal distribution of an ecological hazard you have studied

(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 word:**

Describe: Provide characteristics and features.

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

**Glossary:**

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.

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.

Temporal distribution: The distribution of geographical phenomena over time; when phenomena occur and/or how frequently, if known.

**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.

**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.

**Note** – processes should relate to spatial and temporal distribution, NOT vulnerability, magnitude or impact.

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

**Temporal distribution** of the ecological hazard should include how often the hazard occurs/has occurred (frequency) and the probability of the hazard occurring, if known.

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Biophysical Process and Human Process: **2 x 4 marks** | **8** |
| **Biophysical process:** A detailed and comprehensive description is given and accurate information is provided of one (1) biophysical process that helps explain the spatial and temporal distribution of a selected ecological hazard. The spatial and temporal distributions of the ecological hazard are thoroughly and accurately described. 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. | 4 |
| An appropriate description is given and general, relatively accurate information is provided of one (1) biophysical process that helps explain the spatial and temporal distribution of a selected ecological hazard. The spatial and temporal distributions of the ecological hazard are clearly and accurately described. 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. | 3 |
| A limited description is given and some generalised information is provided of one (1) biophysical process that helps explain the spatial and temporal distribution of a selected ecological hazard. The spatial and/or temporal distributions of the ecological hazard are described to a limited extent. Limited evidence is used to support statements and generalisations. There is limited use of geographical terminology and concepts in a largely unstructured response. | 2 |
| A very basic description is given and little information is provided of one (1) biophysical process that helps explain the spatial and temporal distribution of an ecological hazard. An attempt may be made to describe the spatial **or** temporal distributions of the 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 |
| No relevant attempt. | 0 |
| **Human process:** A detailed and comprehensive description is given and accurate information is provided of one (1) human process that helps explain the spatial and temporal distribution of a selected ecological hazard. The spatial and temporal distributions of the ecological hazard are thoroughly and accurately described. 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. | 4 |
| An appropriate description is given and general, relatively accurate information is provided of one (1) human process that helps explain the spatial and temporal distribution of a selected ecological hazard. The spatial and temporal distributions of the ecological hazard are clearly and accurately described. 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. | 3 |
| A limited description is given and some generalised information is provided of one (1) human process that helps explain the spatial and temporal distribution of a selected ecological hazard. The spatial and/or temporal distributions of the ecological hazard are described to a limited extent. Limited evidence is used to support statements and generalisations. There is limited use of geographical terminology and concepts in a largely unstructured response. | 2 |
| A very basic description is given and little information is provided of one (1) human process that helps explain the spatial and temporal distribution of a selected ecological hazard. An attempt may be made to describe the spatial **or** temporal distributions of the 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 |
| No relevant attempt. | 0 |
| **TOTAL** | **8** |

**Question 34 (20 marks)**

1. Evaluate the sustainability of risk management procedures and practices designed to reduce the impacts of an ecological hazard you have studied.

(12 marks)

**Syllabus:**

The sustainability of risk management policies, procedures and practices designed to reduce the impacts of the hazard, in the short and long term, through prevention, mitigation and preparedness.

**Key word:**

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

**Glossary:**

Sustainability: Meeting the needs of current and future generations through simultaneous environmental, social and economic adaptations and improvements.

Risk management: The forecasting and evaluation of risks together with the identification of procedures to avoid or minimize their future impact.

Prevention: Focuses on the long-term aspects of hazards and avoiding the risks associated with their reoccurrence.

Mitigation: The ability to moderate (reduce or eliminate) the severity of a hazard or similarly adverse occurrence.

Preparedness: Actions carried out prior to the advance notice of a hazard to create and maintain the capacity of communities to respond to, and recover from disasters.

**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.

**NOTE:** The focus taken here is on the ability of the procedures and practices to sustainably prevent, mitigate and prepare for the hazard.

Students will need to evaluate (appraise the value of) procedures and practices for a chosen ecological hazard in terms of their ability to sustainably prevent, mitigate and prepare for the hazard in the region it is active. Consideration will need to be taken of the environmental, economic and social sustainability of the procedures and practices. Aspects to be considered may include:

**Environmental** – do the procedures and practices, impact other aspects of the environment such as other species, habitats, water supplies and air quality?

**Economic** – are the measures affordable for the intended country, region, community or individuals affected? Are the costs involved sustainable in the short term and long term? Can governments, NGO’s and individuals afford the ongoing procedures and practices?

**Social** – are the procedures and practices available and affordable to all individuals and communities in need of their application, both now and into the future?

**Marking Key:**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| A detailed and comprehensive evaluation of the sustainability of relevant risk management procedures and practices for a chosen ecological hazard is provided. Integrated information about the sustainability (all three aspects: environmental, economic and social) and effectiveness of the procedures and practices to reduce the impacts of an ecological hazard is provided. A wide range of appropriate supporting evidence is used to develop and strengthen the evaluation. 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 detailed evaluation of the sustainability of relevant risk management procedures and practices for a chosen ecological hazard is provided. Accurate information about the sustainability (all three aspects: environmental, economic and social) and effectiveness of the procedures and practices to reduce the impacts of an ecological hazard is provided. A range of appropriate supporting evidence is used to develop and expand the evaluation. The accurate use of relevant geographical terminology and concepts are applied to develop a cohesive and detailed answer, with well-developed sentences and paragraphs in an extended answer format. | 9-10 |
| An appropriate evaluation of the sustainability of relevant risk management procedures and practices for a chosen ecological hazard is provided. Generally relatively accurate information about the sustainability (all three aspects: environmental, economic and social) and effectiveness of the procedures and practices to reduce the impacts of an ecological hazard is provided. Some supporting evidence is used to develop the evaluation. Geographical terminology and concepts are used to construct a response that shows some detail, but may have difficulty clearly articulating ideas. | 6-8 |
| A limited evaluation of the sustainability of some risk management procedures and practices for a chosen ecological hazard is provided. Generalised information about the sustainability (all three aspects may **not** be covered) and effectiveness of the procedures and practices to reduce the impacts of an ecological hazard is provided. Limited evidence is used to support the generalisations. There is limited geographical terminology in a largely unstructured response. | 3-5 |
| A very basic and limited evaluation of the sustainability of some risk management procedures and practices is provided. The specific ecological hazard they relate to may **not** be evident. Little detail about the sustainability (all three aspects may **not** be covered) and effectiveness of the procedures and practices to reduce the impacts of an ecological hazard is provided. No evidence is used to support the generalisations. There is limited geographical terminology and poor literacy skills contribute to a response that is difficult to understand | 1-2 |
| No relevant attempt. | 0 |
| **TOTAL** | **12** |

**END OF QUESTIONS**