The total of all marks is 40.
Topic 1: Weather Hazards and Climate Change

The Earth's atmosphere is constantly in motion. Study Figure 1 below. Complete Figure 1 by labelling cells A and B. *(max 2 marks)*
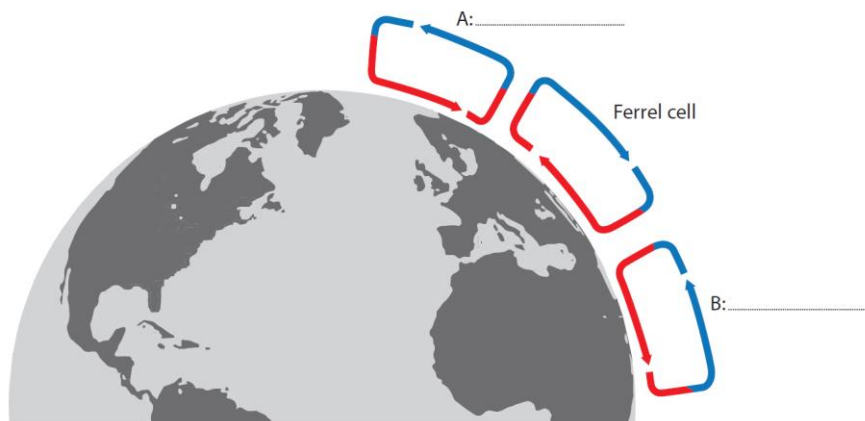

Figure 1. The global atmospheric circulation cells in the northern hemisphere

Answer
Award 1 mark for each of the following, up to a maximum of 2 marks.
Cell A – Polar (1), Cell B – Hadley (1).

Study Figure 2. Explain _one_ reason why more heat energy is received at the Equator than at the poles. *(max 3 marks)*
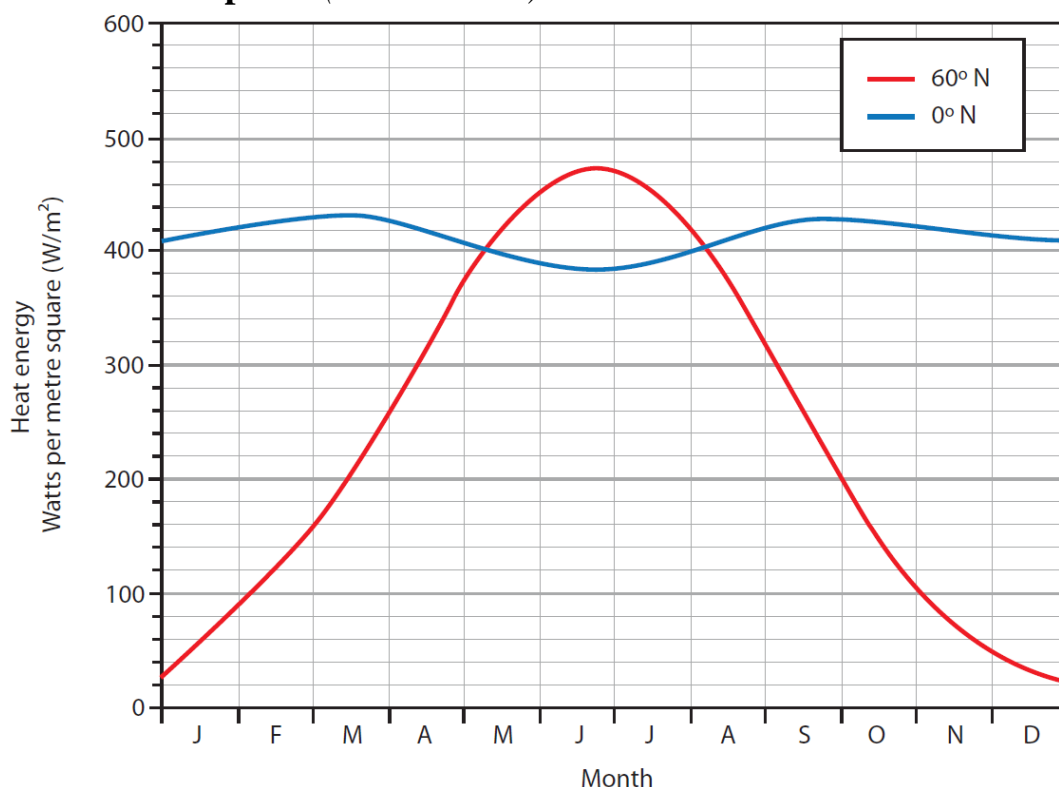

Figure 2. Monthly values of heat energy received from the sun at different latitudes in Watts per metre square (w/m²)

Answer

Award 1 mark for identifying a reason, and a further 2 marks for expansion, up to a maximum of 3 marks.

The Earth's surface is curved (1) so heat/radiation from the sun hits the surface at different angles (1) and the equator receives more concentrated heat/radiation (1).

Heat/radiation from the sun is more concentrated at the Equator (1) because the sun's rays are more direct here (1) due to the curved shapes of the Earth (1).

The Sun's rays travel through less atmosphere to get to the Equator (1) because of the curved shape of the Earth (1) which means that less heat is lost before it reaches the surface (1).

Accept any other appropriate response.

The global climate was different in the past and continues to change due to natural causes. Study Figure 3. Calculate the range of temperatures shown in Figure 3. You must show your working in the space below. *(max 2 marks)*
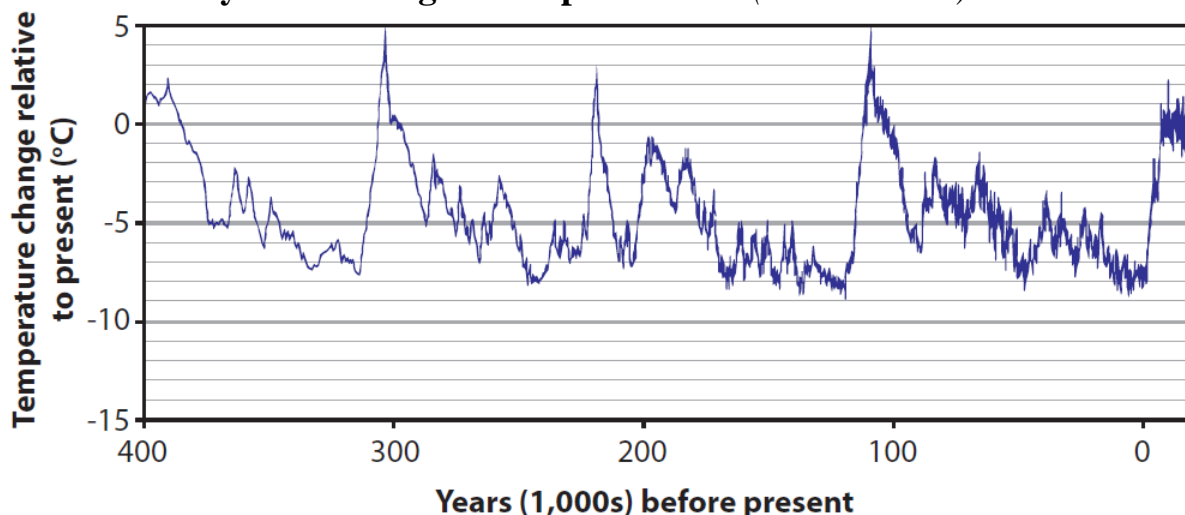

Figure 3. A line-graph showing changes in the average global surface temperature

Answer

Working to show:

Difference between maximum and minimum = 1 mark.

Correct answer is 14 = 1 mark.

Max of 1 mark if no working shown (or incorrect working) but correct answer or correct workings and incorrect answer.

Historical records such as Figure 3 provide evidence of natural climate change. State _two_ other pieces of evidence of natural climate change. *(max 2 marks)*
Answer

Award 1 mark for each of the following, up to a maximum of 2 marks.

Tree rings (1) Ice cores (1) Proxy records (1) Pollen records (1) Diaries (1) Paintings (1) Glacial retreat (1) Sea level (1) Fossils (1) Rock type (1).

2

Accept any other appropriate response.

Explain _one_ way in which the Milankovitch cycles can affect global temperature.
(max 3 marks)
Answer
Award 1 mark for identifying a change suggested by Milankovitch, and a further 2 marks for expansion, up to a maximum of 3 marks.

The (eccentricity of the) Earth's orbit changes (1) so the Earth's orbit becomes more/ less circular (1) which increases/ decreases seasonal differences in temperatures (1).

The (eccentricity of the) Earth's orbit changes (1) so at some times in the year the Earth is closer to/ further away from the sun (1) which increases/ decreases temperatures (1)

The tilt of the Earth's axis changes (1) so that sometimes the Earth is tilted further away from the sun (1) which makes the difference between the seasons greater (1).

The tilt of the Earth's axis changes (1) so that sometimes the Earth is tilted closer to the sun (1) which makes the difference between the seasons smaller (1).

The Earth 'wobbles' on its axis when it rotates (1) so the direction the axis is facing changes (1) which can lead to smaller (or greater) differences between summer and winter (1).

Accept any other appropriate response.

Tropical cyclones develop under specific conditions and in certain locations. Study Figure 4. Identify the feature labelled X on Figure 4. *(max 1 mark)*
Answer
Award 1 mark for any of the following, up to a maximum of 1 mark:
Eye (1) Eye wall (1) Storm eye / eye of the storm (1).

Calculate the diameter of the tropical cyclone (shown by the line Y-Z) on Figure 4. You must show your workings in the space below. *(max 2 marks)*
Answer
Working to show:
Idea of scaling up by 100 times e.g. multiplication of measured distance by 100 = 1 mark.

Correct answer is 900 = 1 mark .

Max of 1 mark if no working shown (or incorrect working) but correct answer or correct workings and incorrect answer.
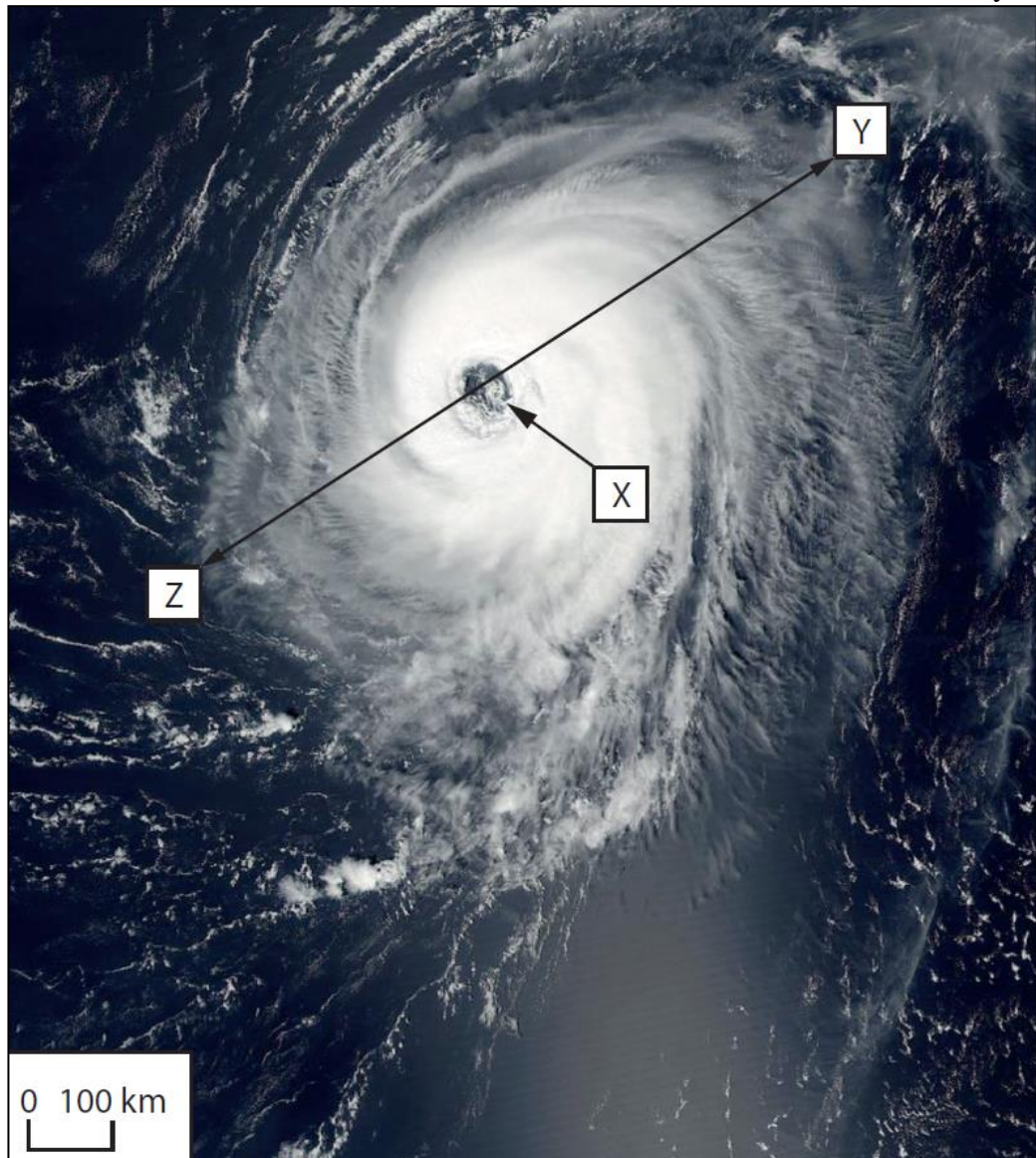
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Figure 4. A satellite image showing Typhoon Meranti, 14 September 2016

Identify which country is regularly affected by tropical cyclones. *(max 1 mark)*
A) Indonesia
B) Finland
C) Peru
D) New Zealand

Hurricane Matthew was the first Category 5 Atlantic hurricane since 2007. Study Figures 5 and 6. With reference to Figures 5 and 6, suggest _two_ reasons for the different impacts of Hurricane Matthew on Florida (USA) and Haiti. *(max 4 marks)*

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It led to 47 deaths in the USA.

The state of Florida planned to evacuate all residents within 100 miles of the coast.

The USA is a developed country with a GNI per capita of US$ 57,540 (2017).

Figure 5. Evacuation in Florida, USA before the landfall of Hurricane Matthew, October 2016

It led to 546 deaths in Haiti.

In Haiti there were only 576 hurricane shelters available with capacity of 90,000 people for a population of 11 million.

Haiti is a developing country with a GNI per capita of US$ 1,760 (2017).

Figure 6. Damage caused by Hurricane Matthew in Haiti, October 2016

Answer

Award 1 mark for the identification of a difference between the two locations, and a further 1 mark for explanation of this difference, up to a maximum of 2 marks for each part.

When the hurricane struck Haiti, it caused more deaths (1) because people were less well prepared (1).

Hurricanes in developing countries cause more deaths (1) because there are fewer hurricane shelters (1).

The hurricane in Haiti caused more buildings to be damaged (1) because in this country, people cannot afford to build hurricane proof buildings (1).

There were fewer deaths in Florida (1) because there might have been better communication links available so people could evacuate sooner (1).

Florida can afford better technology (1) therefore they were able to evacuate people prior to the hurricane (1).

Do not accept 'mirrored' responses. Accept any other appropriate response.

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Topic 2: Challenges of an Urbanising World

Identify which _one_ of the following is a definition of urban primacy. *(max 1 mark)*
A) A city with a population of over 1 million people.
B) A city which is experiencing de-industrialisation.
<u>C) A city with a much larger influence than the other cities in the country.</u>
D) A city which is dominated by industries such as mining and fishing.

Define the term _megacity_. *(max 1 mark)*
Answer
A megacity is a city with a population of 10 million or more (1).

Study Figure 7 which shows data about the urban populations of selected African countries. Suggest _one_ reason for the differences in the annual rate of growth of urban population shown in Figure 7. *(max 2 marks)*

Country	Annual rate of growth of urban population (%)	Percentage of population which is urban
Angola	4.32	65.5
Burkina Faso	4.99	29.4
Burundi	5.68	13.0
Eritrea	3.86	40.1
Mali	4.86	42.4
South Africa	1.97	66.4

Figure 7.

Answer
Award 1 mark for correctly stating why rates of urbanisation may differ between countries and a further mark for explanation of that reason.
● In some countries, there may be more rapid rates of rural to urban migration (1) due to investment in urban locations from TNCs (1).
● In some countries, there may be more rapid rates of natural increase (1) especially in cities where access to contraception may be an issue (1).
● In some countries, civil war and the lack of security in rural areas (1) has led to rapid rural-urban migration as people seek safety (1).
● Some countries already have a high percentage of their total population which is urban (1) so the rates of urbanisation may be smaller (1).
Accept any other appropriate response.

Study Figure 8 which shows variations in the type of employment for countries at different levels of development.
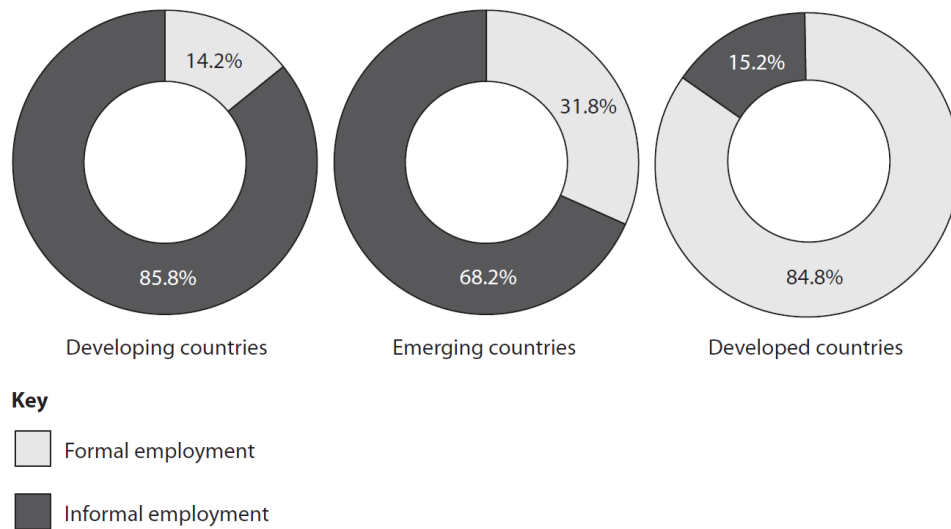

Figure 8.

Identify _one_ characteristic of formal employment. *(max 1 mark)*
A) jobs do not have a weekly regular wage.
B) workers pay taxes on their earnings.
C) workers have little income protection if they fall sick.
D) jobs often involve working irregular hours.

Calculate the difference between the percentage (%) employed in the formal sector in developed and developing countries using Figure 8. *(max 1 mark)*
Answer
84.8%-14.2% = 70.6% (1).

Explain _two_ reasons why there is a high percentage of people working in informal employment in cities in developing countries. *(max 4 marks)*
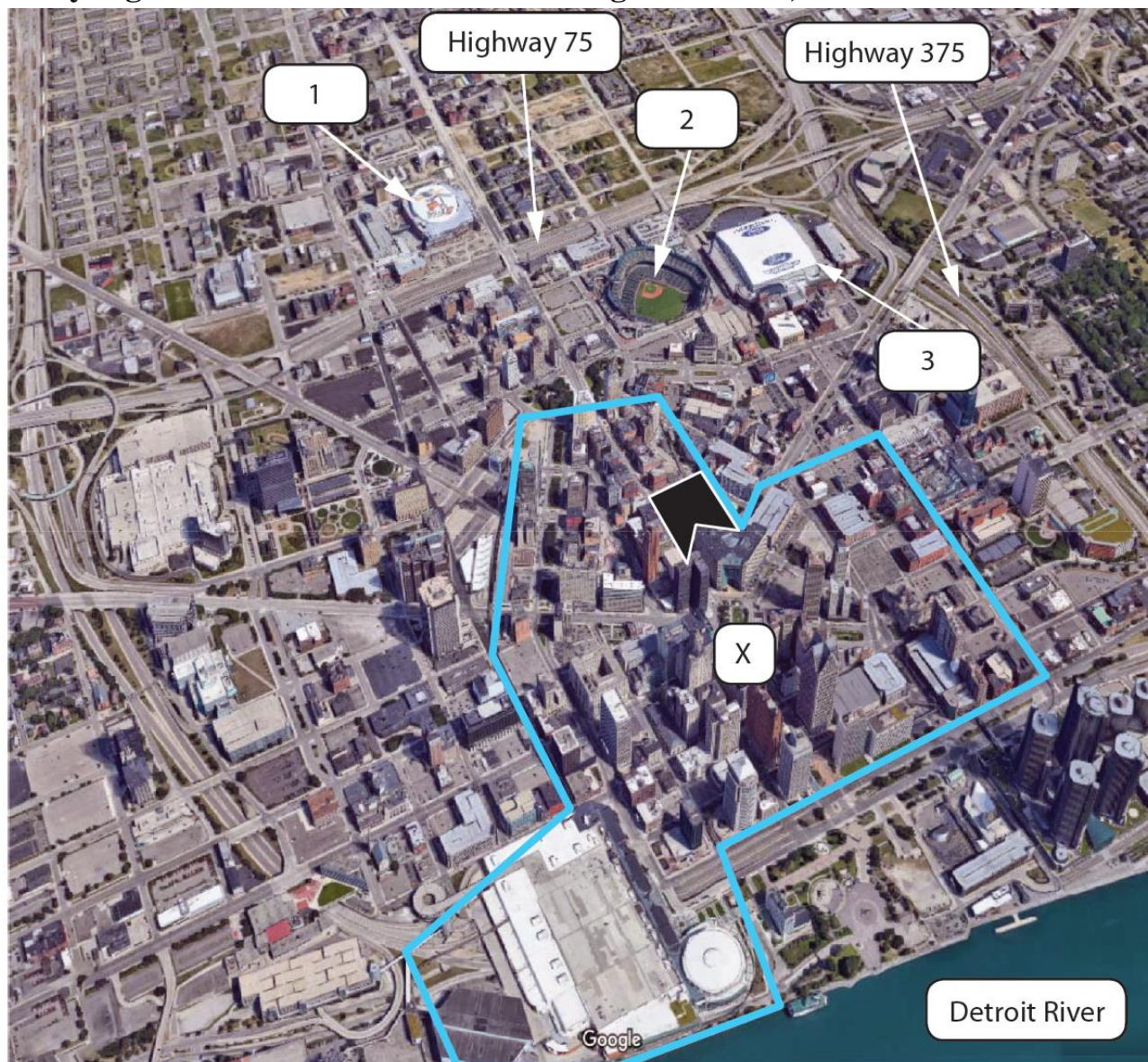**Answer**
Award 1 mark for identifying a reason why people work in informal employment in developing countries and a further mark for an extension of that difference up to a max of 2 marks for each explanation.
● In low income countries there are often a larger number of informal workers due to a lack of formal jobs (1) because of a lack of investment (1).
● In developing world cities there is a lack of formal jobs (1) caused by rapid rural-urban migration (1).
● In developing world cities people often lack the skills required in formal jobs (1) because of a poor education (1).

Please note: Take care to avoid double crediting responses. Only allow 1 mark for lack/shortage of formal jobs.

Accept any other appropriate response.

Study Figure 9 which shows a satellite image of Detroit, USA.

Key

— The boundary of Central Business District (CBD) and route of the Detroit People Mover train system

◣ Hudson's redevelopment site

(1, 2, 3) Sporting facilities

Figure 9.

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Identify the main type of land use shown in Figure 9 at location. *(max 1 mark)*

A) residential

B) industrial

C) commercial

D) transport

Describe the distribution of sports facilities in this area. *(max 2 marks)*

Answer

Award 1 mark for each valid description of the location of sporting facilities in the area using the compass point or a description of its proximity to a feature or use of the scale. The facilities may be described as a group or individually. Allow a maximum of 1 proximity mark.

● Sporting facilities are found to the north of the central business district (1).

● Sporting facilities 1 and 2 are close to Highway 75 (1).

● Sporting facility 3 is close to Highway 375 (1).

● They are close to residential areas (1).

● The sporting facilities are found quite close to each other (1).

● Sporting facility 2 is found very close to sporting facility 3 (1)

● Sporting facility 1 is 300m North of the boundary of the CBD (1).

● Sporting facilities are outside of the CBD area (1).

Accept any other appropriate response.

Suggest _two_ reasons why the Hudson's redevelopment site may be attractive for future development. *(max 4 marks)*

Answer

Award one mark for identifying an advantage of the location of the site and a further mark for extension of that factor, up to a maximum two marks each.

● The site is close to the Detroit people mover (1) which will provide easy access for the public. (1).

● Being a redevelopment site, it may be an area of vacant land (1) which will minimise redevelopment costs (1).

● The site is in near many other large commercial premises / in Detroit's CBD (1) making it an area with high footfall (1).

● The site is close to many major roads (1) which improve accessibility (1).

● The site would be attractive for residential development as it is approx. 600-700m north of the Detroit River (1), which could provide attractive waterfront walks (1).

Accept any other appropriate response.

For Lagos megacity (Nigeria), explain _one_ way its location has influenced its growth. *(max 3 marks)*

Answer

Award one mark for identifying a locational factor which has contributed to the growth of the megacity and further marks for explanation of the factor identified. Growth can be explained in terms of a cities' economic, physical or demographic growth.

● Being situated close to huge oil reserves (1) has enabled Lagos to become an important oil port (1) which has attracted large numbers of migrants to the city (1).

● Situated centrally on the Chinese coast (1), Shanghai has developed as a major port both nationally and internationally (1). This has helped it to become a major export zone for TNC's (1).

NB The location factor which has been identified needs to be accurate. A generic answer identifying a locational factor lacking accurate application to a megacity max 1 mark.

Accept any other appropriate response.