



# education

Department of  
Education  
FREE STATE PROVINCE

**GEOGRAPHY**

**TEST ONE**

*Stanmorephysics.com*

**GRADE 11**

**18 MARCH 2025**

**MARKS: 60**

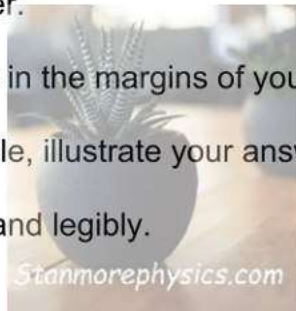
*Stanmorephysics.com*

**TIME: 1 HOUR**

**This question paper consists of 8 pages.**

## INSTRUCTIONS AND INFORMATION

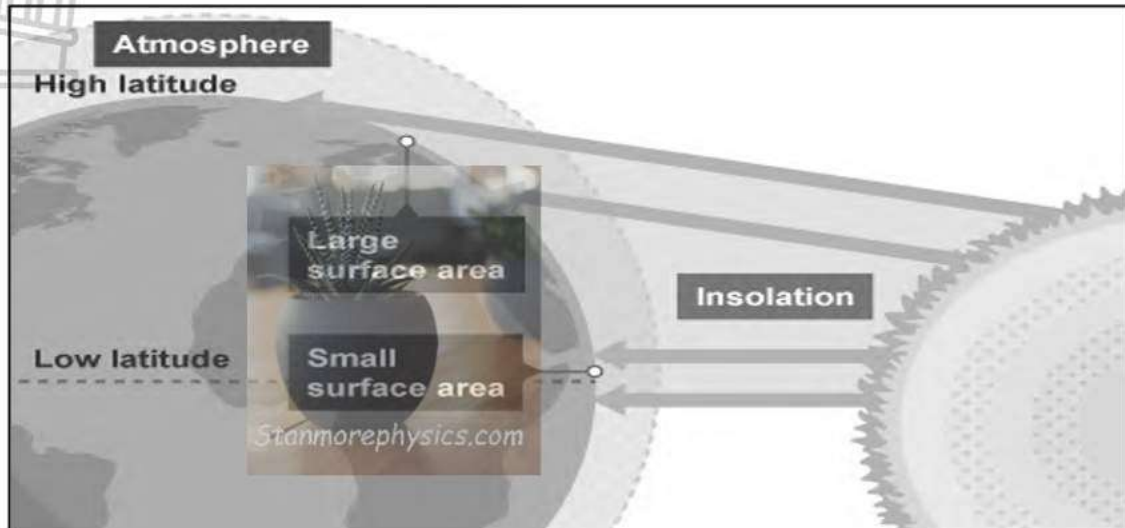
1. Answer ALL the questions.
2. Answer the paragraph questions in the form of a paragraph.
3. ALL diagrams are included in the question paper.
4. Leave a line between subsections of questions answered.
5. Number the answers correctly according to the numbering system used in this question paper.
6. Do NOT write in the margins of your ANSWER BOOK.
7. Where possible, illustrate your answers with labelled diagrams.
8. Write clearly and legibly.



**QUESTION 1**

**1.1 The atmosphere**

Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1.1 to 1.1.7) in the ANSWER BOOK, for example 1.1.8 D.



1.1.1 The incoming solar energy that reaches the Earth's surface is called ...

- A Energy loss
- B Insolation
- C absorption
- D High temperature

(1x1) (1)

1.1.2 The amount of insolation that heats the atmosphere depends on ...

- A winds.
- B the latitude.
- C the Coriolis force.
- D high temperature.

(1x1) (1)

1.1.3 The further one moves from the equator, the more insolation will ...

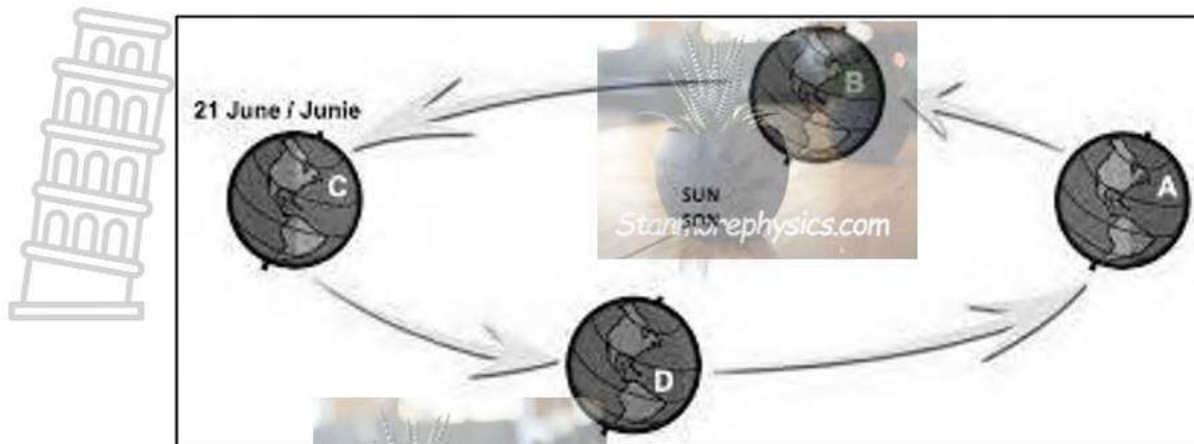
- A decrease.
- B increase.
- C fluctuate.
- D stay the same.

(1x1) (1)

1.1.4 The Earth receives more energy than it needs at the equator as

- A energy surplus.
- B Energy distribution.
- C Energy deficit.
- D energy balance.

(1x1) (1)



1.1.5 The seasons occur as a result of ... (1x1) (1)

- A insolation.
- B rotation.
- C revolution.
- D ocean currents

1.1.6 Sketch A illustrate ... in the Southern Hemisphere, with the days being ... than the night at the equator (1x1) (1)

- (i) winter solstice
- (ii) summer solstice
- (iii) longer
- (iv) shorter

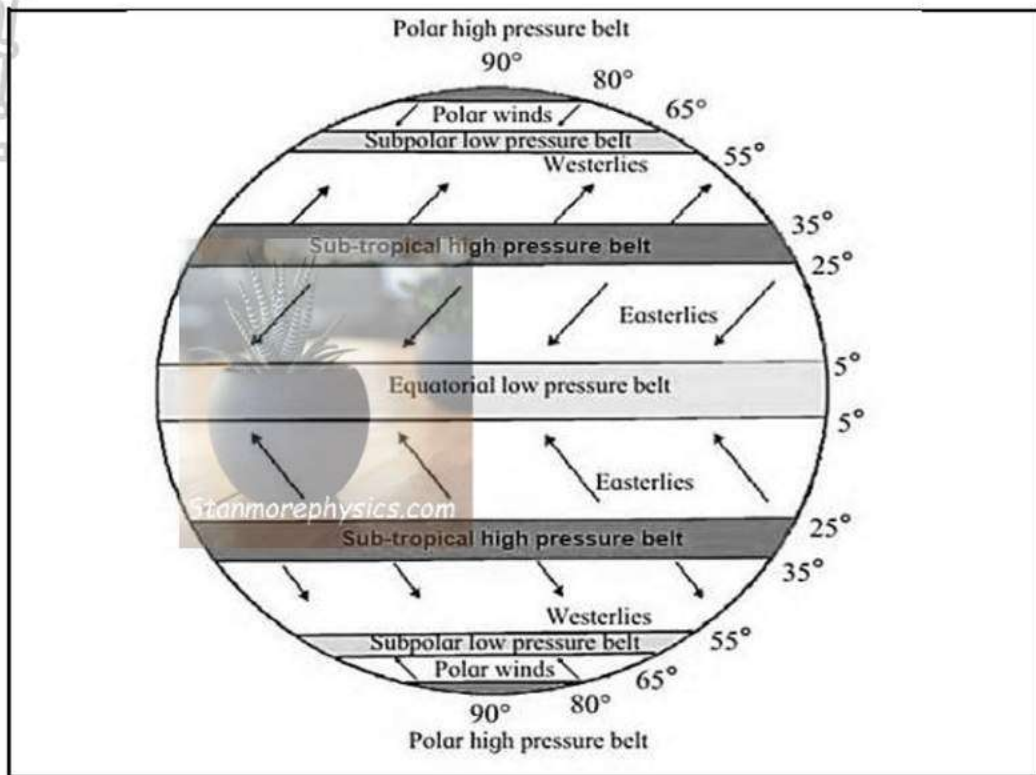
- A (i); (iii)
- B (i); (ii)
- C (ii); (iii)
- D (ii); (iv)

1.1.7 ... represent Mid-autumn days that fall on the 21<sup>st</sup> of March when there's equal length of day and night. (1x1) (1)

- A Sketch **A**
- B Sketch **B**
- C Sketch **C**
- D Sketch **D**

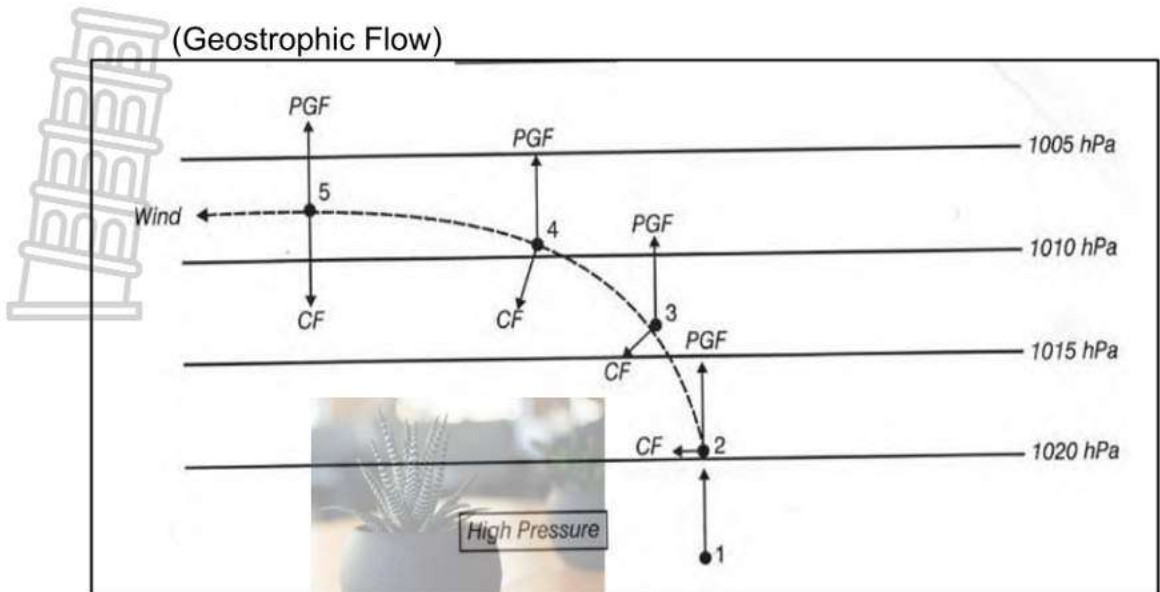
(7X1) (7)

1.2 Read the following statements and choose the appropriate word(s) in brackets which will make the statement TRUE. Write down only the question number (1.2.1 to 1.2.8) (Pressure belts and winds)



[Source: studyhash.com]

- 1.2.1 The sub-polar low pressure is created by (divergence/ or convergence) of air movement. (1x1) (1)
- 1.2.2 ITCZ is associated with (subpolar low-pressure belt/ Equatorial low-pressure Belt) (1x1) (1)
- 1.2.3 Subsiding warming air causes a belt of high-pressure cells called the (subtropical high-pressure belt/ polar high pressure belt) (1x1) (1)
- 1.2.4 (Westerlies/ Tropical Easterlies) blow from the subtropical regions to the temperate regions. (1x1) (1)



<https://africansunroad.com/coriolis-force/>

- 1.2.5 The air at 1, a high-pressure area, moves towards the low pressure area because of the (pressure gradient / Coriolis) force, at right angles to the isobars (1x1) (1)
- 1.2.6 Winds deflect or change direction because of (pressure gradient/ Coriolis force) (1x1) (1)
- 1.2.7 When the wind reaches 5, both forces are balanced. The wind is now blowing (Perpendicular/ Parallel) to the isobars. (1x1) (1)
- 1.2.8 The direction of the wind in the sketch above represents conditions in the (Southern/ Northern) hemisphere. (1x1) (1)
- (8)

1.3 Refer to the extract below on the **Föhn winds**



**DEVIL'S WIND, DEVIL'S BREATH OR RED WIND**

These are all other names for the Santa Ana winds that are notorious in Southern California. They belong to the **katabatic Föhn winds**, like the bora. They originate from a high that forms over the Great Basin. This typically forms in the winter months, as the high temperatures in summer tend to counteract a high (heat low).

The Santa Ana winds often hit the coastal area with gale force, wind speeds of over 100 km/h are not uncommon – and 150 km/h are also possible. The air is very warm to hot and stands in stark contrast to the otherwise rather subdued temperatures in winter (cold coastal waters due to the California Current). Temperatures rise abruptly when the Santa Ana winds arrive, and the air is warmer than in the desert inland due to the sinking movement. The air is also very dry and the relative humidity can drop below 10%.

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<https://meteonews.ch/en/News/N14723/The-Santa-Ana-winds>

- 1.3.1 What are Föhn winds? (1x2) (2)
- 1.3.2 According to the extract, Föhn winds usually occur in which season? (1x1) (1)
- 1.3.3 "... the air is **warmer** than in the desert inland due to the sinking movement. The air is also very **dry** ..."  
Explain why the wind is warmer and dry. (1x2) (2)
- 1.3.4 Explain why the windward side is usually wet/ rainy. (1x2) (2)
- 1.3.5 In a paragraph of approximately EIGHT lines, discuss the impacts of the **Föhn winds** on the natural environment and suggest the management strategies that could be implemented to reduce the impact. (4x2) (8)

[15]

1.4 Refer to the infographic on the role of oceans in climate control in Africa.

December 2024 temperatures		
City	Maximum temp °C	Minimum temp °C
Durban	28	20
Cape Town	25	14

<https://www.timeanddate.com/weather/south-africa/durban/climate>

Ocean currents influence the weather of the coastal areas.

Due to evaporation from the oceans, the winds blowing from the sea to the land carry moisture, (Onshore winds) to coastal areas.

Any moisture in the air condenses to form either mist or fog

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Weather outlook for Thursday, 19 December 2024 Issued: 19 December 2024 @ 08:30 SAST

Rainfall Probability (%)

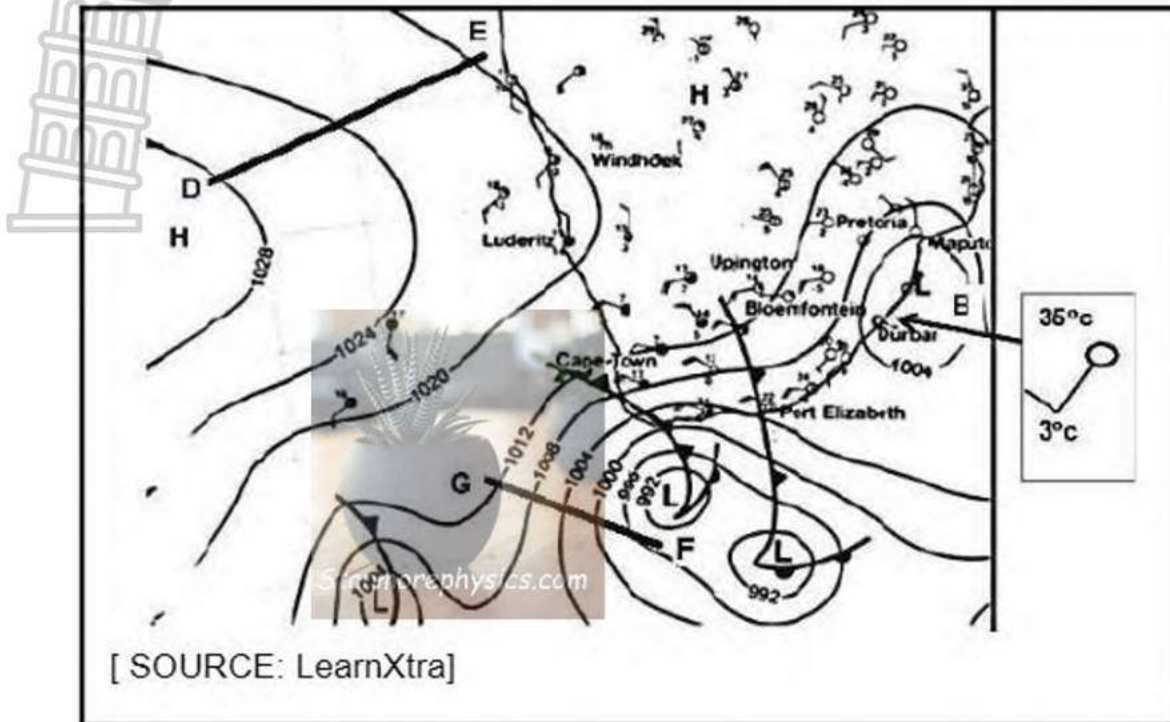
30% - Isolated  
60% - Scattered  
80% - Widespread

<https://snowreport.co.za/south-africa-weather-forecast-19-december-2024/>

- 1.4.1 Define diurnal temperature range (1x2) (2)
- 1.4.2 “According to the infographic, which city has the smallest diurnal temperature range ,and what is the range?” (2x1) (2)
- 1.4.3 Identify ocean current **A** and **B**, which influence the climate of the Soth Africa. (2x1) (2)
- 1.4.4 What do we call winds that blow from the ocean towards the land? (1x1) (1)
- 1.4.5 Explain why ocean current **A** is responsible for cold and dry west coastal conditions. (2x2) (4)
- 1.4.6 Account for warm temperatures and high rainfall in Durban (influence of ocean current **B** identified in QUESTION 1.4.3) (2x2) (4)

[15]

1.5 Study the Synoptic weather map below and answer the questions that follow.



- 1.5.1 a) What is the season shown on the synoptic weather map? (1x1) (1)
- b) Support your answer to QUESTION 1.5.1 a) with evidence from the synoptic weather map. (1x2) (2)
- 1.5.2 Determine the isobaric interval on the synoptic weather map. (1x1) (1)
- 1.5.3 Name the high-pressure system on the west of South Africa. (1x1) (1)
- 1.5.4 Explain how the high-pressure system identified in QUESTION 1.5.3 affects the weather of South Africa (1x2) (2)
- 1.5.5 Compare the wind strength between line **D-E** and line **G-F** in respect to spacing of the isobars. (2x2) (4)
- 1.5.6 Describe the weather conditions experienced in Durban. (4x1) (4)

[15]

**TOTAL 60**



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MARKING GUIDELINE

**This Marking Guideline consists of 6 pages.**

**QUESTION 1**

**1.1 The atmosphere**



1.1.1 B

(1x1) (1)

1.1.2 B

(1x1) (1)

1.1.3 A

(1x1) (1)



1.1.4 A

(1x1) (1)

1.1.5 C

(1x1) (1)

1.1.6 C

(1x1) (1)

1.1.7 B

(1X1) (1)



(7)

**1.2 Pressure belts, winds and geostrophic flow**

1.2.1 convergence

(1x1) (1)

1.2.2 Equatorial low-pressure Belt

(1x1) (1)

1.2.3 subtropical high-pressure belt

(1x1) (1)

1.2.4 Westerlies

(1x1) (1)

1.2.5 pressure gradient

(1x1) (1)

1.2.6 Coriolis force

(1x1) (1)

1.2.7 Parallel

(1x1) (1)

1.2.8 Southern

(1x1) (1)

(8)

### 1.3 The Föhn winds

concept	1.3.1	Föhn winds are warm dry winds that descend on the leeward slopes of mountain. (2)	(1x2)	(2)
season	1.3.2	Winter (1)	(1x1)	(1)
why the wind is warmer and dry	1.3.3	As the air descends on the leeward side of the mountain, it warms rapidly at the DALR because now there is little moisture in the air/ and a drop in relative humidity (RH). (2)	(1x2)	(2)
why the windward side is usually wet/ rainy.	1.3.4	Moist air rising up the windward slope, cools as it ascends. (2) The air cools and causes water vapour to condense to form clouds, then there will be rain or snow on the windward slope. (2) <b>Any ONE</b>	(1x2)	(2)
Impacts of the Föhn winds on the natural environment and management strategies	1.3.5	<p><b>IMPACT ON NATURAL ENVIRONMENT</b></p> <ul style="list-style-type: none"> <li>• Föhn winds may cause drought conditions. (2)</li> <li>• Dry out the vegetation (2)</li> <li>• Promote the ignition and rapid spread of the forest fires (veld fires). (2)</li> <li>• They may also melt the snow, causing avalanches and floods (2)</li> </ul> <p><b>MANAGEMENT STRATEGIES</b></p> <ul style="list-style-type: none"> <li>• Early warning systems (2)</li> <li>• Educating the public about the risks and potential impact of (2)</li> <li>• Föhn winds on the natural environment can help foster a sense of responsibility towards its protection. (2)</li> <li>• Raising awareness about the importance of conserving natural resources and taking preventive actions can lead to a collective effort to reduce the impact of these winds (2)</li> <li>• Plant windbreaks: Create natural barriers using trees and shrubs to reduce the direct impact of Föhn winds on the environment. (2)</li> <li>• Planting dense vegetation along the perimeter of susceptible areas can help protect plants, soil, and wildlife. (2)</li> <li>• Preserve natural habitats: Protecting natural habitats can help safeguard the flora and fauna from the destructive force of Föhn winds. (2)</li> <li>• By preserving forests, wetlands, and other natural areas, the impact of these winds can be minimized. (2)</li> </ul>	(4x2)	(8)

**ANY FOUR: MUST REFER TO BOTH THE IMPACT AND THE MANAGEMENT STRATEGIES.**



[15]

1.4 Infograph on the role of oceans in climate control in Africa

diurnal temperature range	1.4.1	Difference between the high temperatures of the day and the low temperatures of the night (2)	(1x2)	(2)
city with the smallest diurnal temperature range?	1.4.2	Durban (1) 8°C (1)	(2x1)	(2)
ocean current A and B	1.4.3	A cold Benguela current (1) B warm Agulhas current (1)	(2x1)	(2)
wind that blows from the ocean	1.4.4	Onshore winds (1)	(1x1)	(1)
why ocean current A is responsible for cold and dry west coastal conditions	1.4.5	<ul style="list-style-type: none"> <li>The air above the cold ocean currents is cold and prevailing winds blow this cold air towards the land (west coast)(2), decreasing the temperatures of (coastal regions), places they flow past (2)/ The cold Benguela ocean current cools the temperature of places on the west coast (2)</li> <li>The air above the cold ocean current holds little water vapour/ little moisture so places washed by cold Benguela current are drier. (2)</li> </ul> <p><b>(ANY TWO 2: MUST REFER TO BOTH TEMPERATURE AND MOISTURE)</b></p>	(2x2)	(4)
Account for warm temperatures and high rainfall in Durban	1.4.6	<ul style="list-style-type: none"> <li>The air above the warm ocean currents is warm and prevailing winds blow this warm air towards the land, raising the temperatures of places they flow past (2)/</li> <li>The warm Agulhas Ocean current raises the temperature of places on the east coast of South Africa (2)</li> <li>The air above the warm ocean current holds more water vapour and therefore is more likely to bring rain in Durban. (2)</li> </ul> <p><b>(ANY TWO 2: MUST REFER TO BOTH TEMPERATURE AND RAINFALL)</b></p>	(2x2)	(4)

[15]



1.5 Synoptic weather map

season	1.5.1	a) Winter (1)	(1x1)	(1)
evidence from the synoptic weather map.		b) Clear skies on the east and the interior of the country (2) Presence of cold front in the interior of the country (2) / (midlatitude cyclone) (2) South Atlantic High-pressure cell is close to the continent (2) <b>ANY ONE</b>	(1x2)	(2)
isobaric interval	1.5.2	4 hPa (1)	(1x1)	(1)
High pressure system on the west	1.5.3	South Atlantic High-pressure cell (1)	(1x1)	(1)
how the high-pressure system identified in Q 1.5.3 affects the weather	1.5.4	It brings cold and dry weather conditions (2)	(1x2)	(2)
wind strength between line D-E and line G-F in respect to spacing of the isobars.	1.5.5	D-E: weak winds or low wind speed; gentle pressure gradient (2) G-F: strong winds or fast wind speed; steep pressure gradient (2)	(2x2)	(4)
weather conditions experienced in Durban	1.5.6	Air temperature: 35°C (1) Dew point temperature: 3°C (1) Cloud cover: clear skies (1) Wind speed: 10 knots (1) Wind direction: South Westerly (1) Precipitation: none (1) <b>ANY FOUR</b>	(4x1)	(4)

[15]

**TOTAL 60**