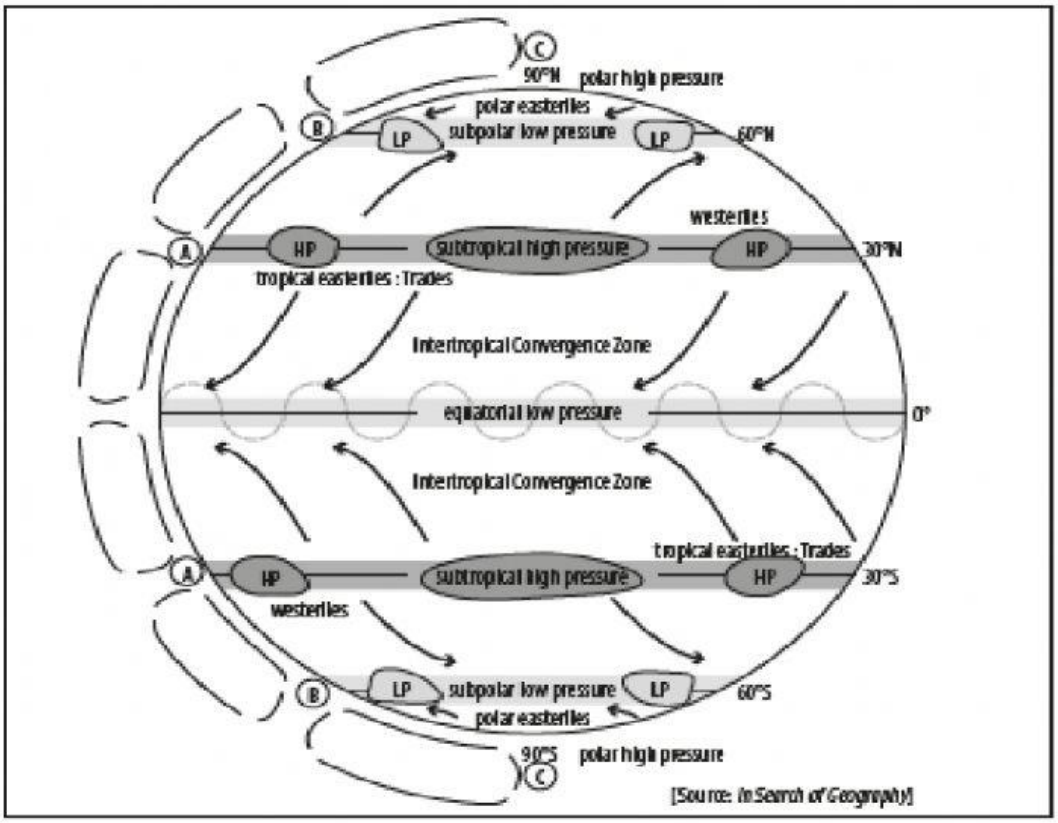
Section A: The atmosphere (115 marks)

Question 1

1.1 Referring to the tri-cellular model of the circulation of the atmosphere, choose the correct term in brackets. Write down only the correct word next to each letter.



The tri-cellular circulation of the atmosphere causes (a. local/ planetary) winds. Because of the high temperatures along the equator (b. high/low) pressure develops and air rises. This causes (c. convergence/ divergence) at the surface. The constantly rising air along the equator causes (d. wet/dry) conditions in that region.

At (A) subtropical high pressure cells are caused by (e. descending/ ascending) air at the Hadley cell. This causes (f. wet/dry) conditions at the surface. At (B) the sub-polar low pressure is caused by (g. high temperatures/ convergence and uplift). At (C) the high pressure is caused by (h. very cold temperatures/ high temperatures).

The winds shown in the diagram are deflected by the (i. Coriolis effect/ pressure gradient force) which results from (j. the revolution of the Earth around the Sun/ the rotation of the Earth on its own axis). (10 × 2)

[20]

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A:)

B:)

C:)

D:)

E:)

F:)

G:)

H:)

I:)

J:)

Question 2

2.1 With the aid of a diagram explain why temperatures are higher at the equator than at the poles. (4 × 2) *(8)*

2.2 List two other factors which affect the difference in temperature on the Earth. (2 × 1) (2)

2.3 The effect of the Earth's tilt means that one hemisphere is more exposed to the sun than the other:

a. At the time of the solstices the Sun is overhead which lines of latitude? (2 × 2) (4)

b. At the time of the equinox the Sun is overhead which line of latitude? (1 × 2) (2)

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c. Which area in the Southern hemisphere receives 24 hours of sunlight in summer? (1 × 2) (2)

d. Which two places on Earth only have a winter and a summer season? (2 × 2) (4)

e. In South Africa, what is the date of the summer solstice? (1 × 2) (2)

Question 3

3.1 Define the following terms:

a. pressure gradient

b. geostrophic wind

c. atmospheric pressure

3.2 Describe the relationship between temperature, air pressure and wind. (3 × 2) (6)

3.3 What is the Intertropical Convergence Zone? (1 × 2) (2)

3.4 Explain why the ITCZ shifts with the seasons. (4 × 2) (8)

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3.5 What is the difference between a continental and maritime air mass? (2 × 2)

3.6 Over Africa which two air masses converge at the ITCZ? (2 × 2) (4)

Question 4

4.1 What is the difference between weather and climate? (2 × 2) (4)

4.2 Name and describe the three climatic regions of Africa. (3 × 2) (6)

4.3 In what way is air subsidence and convergence linked to rainfall in Africa? (2 × 2) (4)

4.4 What is El Niño and how does it affect Africa's climate? (2 × 4) (8)

Question 5

5.1 Define the following terms:

a. drought

b. desertification (2 × 1)

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5.2 Discuss the risk of desertification on the Succulent Karoo and Nama Karoo. (4 × 2) (8)

5.3 Discuss the impact of drought and desertification on the environment. (5 × 1) (5)

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