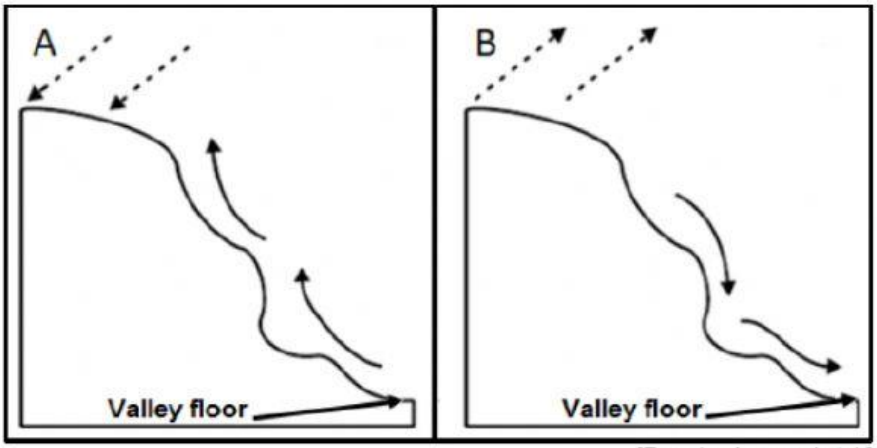
SECTION A: CLIMATE, WEATHER AND GEOMORPHOLOGY

QUESTION 1

FIGURE 1.1: VALLEY CLIMATES



[Examiner's own sketch]

1.1.1 The air movement associated with upslope flow

1.1.2 Air movement that occurs at the night

1.1.3 Air movement that originates due to the rate of insolation

1.1.4 Air movement that mostly reduces air pollution at the bottom of the valley

1.1.5 Air movement associated with dense, heavy air

1.1.6 Air movement associated with the formation of frost on the valley floor

1.1.7 The direction of air movement determined by gravitational forces

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COLUMN A		COLUMN B	
1.2.1	Drainage pattern that is common along steep slopes of ridge or hills	A	trellis
1.2.2	Drainage pattern found in areas where glaciers have occurred	B	dendritic
1.2.3	The main stream has right angle bends in this drainage pattern	C	radial
1.2.4	Drainage pattern associated with streams that flow towards a central low-lying area	D	rectangular
1.2.5	Drainage pattern associated with a dome feature	E	deranged
1.2.6	Drainage pattern that originates in areas with alternative layers of hard and soft rock	F	antecedent
1.2.7	Drainage pattern that is usually uniform and tributaries join at acute angles	G	centripetal
1.2.8	The river is younger than the underlying rock structure over which it flows	H	superimposed
		I	parallel

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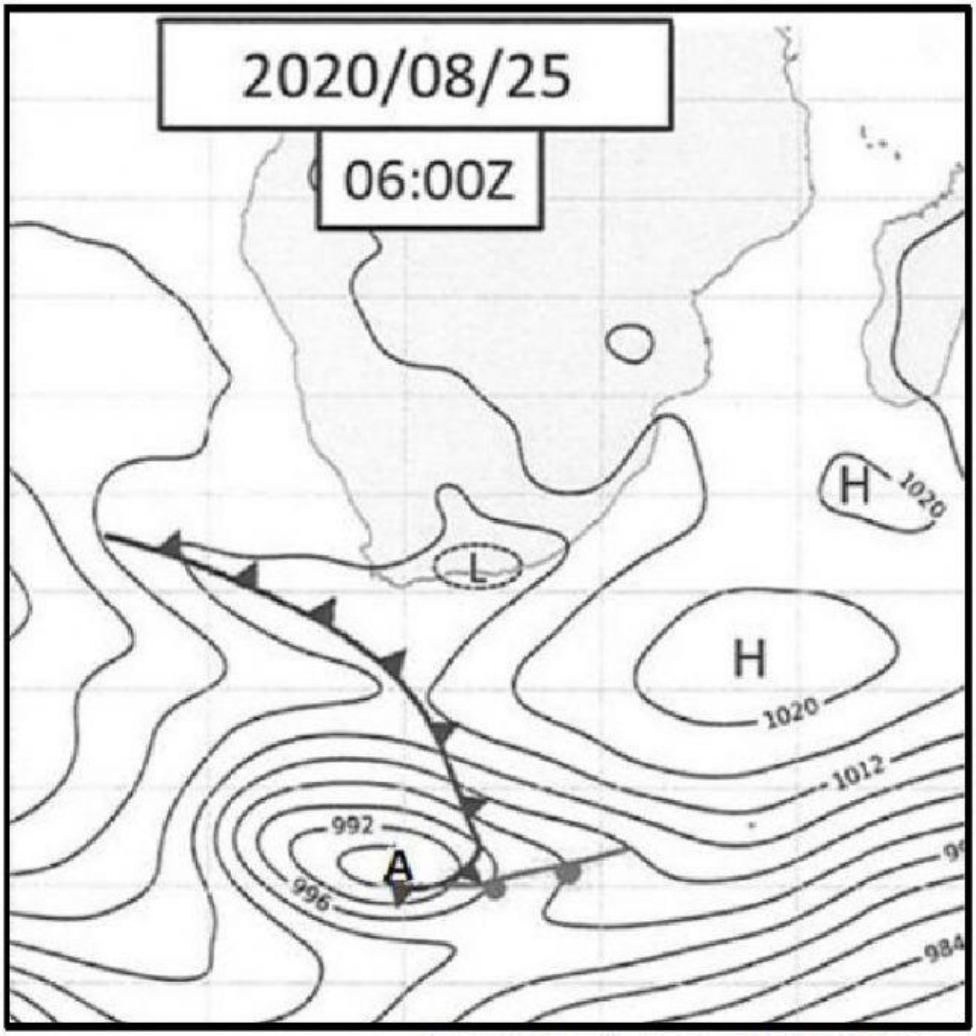
FIGURE 1.3: MID-LATITUDE CYCLONE



[Source: South African Weather Bureau]

1.3.1 Give evidence from the diagram that suggests that weather system **A** is a mid-latitude cyclone. (1 x 1) (1)

1.3.2 Why does this weather system originate at the polar front? (1 x 2) (2)

1.3.3 Give a reason for the direction of movement of this weather system. (1 x 2) (2)

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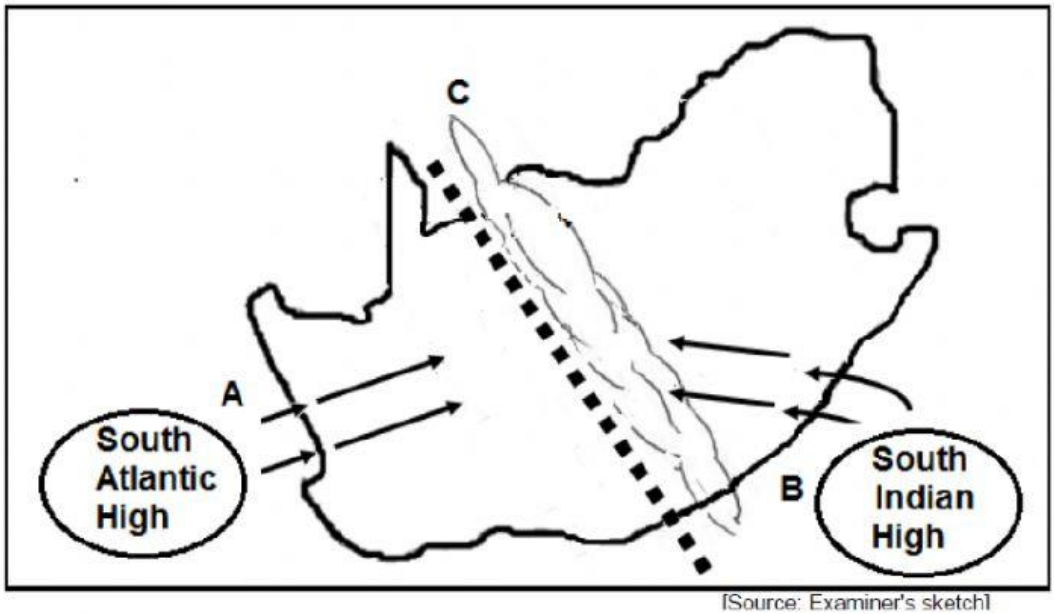
1.3.4 Why is the cold front associated with severe weather conditions? (1 x 2) (2)

1.3.5 Explain the formation of the stage of development shown in FIGURE 1.3 of the mid-latitude cyclone. (4)

1.3.6 Why does the cold front of the mid-latitude cyclone have a positive impact on agricultural activities in the Western Cape? (2 x 2) (4)

FIGURE 1.4: LINE THUNDERSTORM



[Source: Examiner's sketch]

1.4.1 Does the line thunderstorm obtain its source of moisture from ocean **A** or **B**? (1 x 1)

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1.4.2 Why is cold, dry air fed in from the South Atlantic High-Pressure Cell? (1 x 2) (2)

1.4.3 Explain how the formation of the moisture front at **C** results in line thunderstorms. (2 x 2) (4)

1.4.4 In a paragraph of approximately EIGHT lines, explain the destructive (harmful) nature of line thunderstorms. (4 x 2) (8)

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