KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GEOGRAPHY

MEMORANDUM

MARCH 2024

NATIONAL SENIOR CERTIFICATE

GRADE 12

MARKS: 60

N.B. This question memorandum consists of 5 pages.

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QUESTION 1

1.1

1.1.1 Mature✓

1.1.2 Clockwise✓

1.1.3 Cold air✓

1.1.4 Gentle pressure gradient✓

1.1.5 Warm sector ✓

1.1.6 D/Cumulonimbus✓

[6]

1.2

1.2.1 A storm with sustained winds near 190 kilometers per hour, torrential rain and heavy flooding✓
A storm that causes snapped and uprooted trees✓
A storm that causes major damage to homes✓
A storm that cause vehicles to be washed away by surges of water✓ (1 x 1) (1)
(ANY ONE)

1.2.2 One✓
Named alphabetically in the season of occurrence✓ (2 x 1) (2)

1.2.3 Cyclone Belal tracked in the warm waters of the Indian Ocean that was ideal for promoting high rate of evaporation✓✓
Friction over the large sea track was minimum, assisting rising air (convection) ✓✓
The water vapour content over the ocean is greater, containing latent heat and this formed the trigger for the full development of the cyclone✓✓
Human-caused climate change has intensified extreme weather in the region✓✓ (1 x 2) (2)
(ANY ONE)

1.2.4 Information is received immediately and can be used to warn people ✓✓
Information can be monitored and evacuation plans can be devised, especially for people in low lying areas. ✓✓
Can take images of large inaccessible areas. ✓✓
The intensity of the storm can be monitored ✓✓
Information can be used to determine wind speed, temperature, wind direction ✓✓
Can be used to predict the path ✓✓ (1 x 2) (2)
(ANY ONE)

1.2.5 Damage to infrastructure which is costly to repair✓✓
Damage to beachfront properties which would negatively affect tourism and the economy✓✓
Loss of crops which leads to food shortages, higher prices and food imports✓✓
Loss of fertile soil leads to increase in production costs and rise in food prices✓✓
Less income generated by farms✓✓
Loss of life will reduce the economically active✓✓
Industries that depend on the primary sector for a supply of raw materials are adversely/negatively affected and have to close temporarily✓✓
Disruption to water and electricity supply due to damaged cables and burst pipes✓✓
Increase in health care costs due to outbreak of diseases✓✓
Increase in insurance claims and cost as a result of storm damage✓✓
Job losses result in loss of income✓✓
(4 x 2) (8)

1.3.1. Urban heat island/pollution dome ✓ (1 x 1) (1)

1.3.2 $6^{O}C$ ✓ (1 x 1) (1)

1.3.3 Geometric shapes of buildings increases surface area for heating✓✓
Building density traps heat✓✓
Multiple reflection of heat✓✓
Less plants/vegetation in city centre to reduce heat ✓✓
Pollutants above city trap/prevent heat from escaping✓✓
Tall buildings prevent circulation ✓✓
Less evaporation because of fewer water surfaces
Concrete in urban areas is able to store three times more heat than the same volume of soil or vegetation✓✓
Concrete absorbs heat slowly during the day and releases it slowly at night thus raising temperatures considerably✓✓
Cities contain a large number of tarred streets which absorbs heat, giving rise to high temperatures✓✓ (1 x 2) (2)
[ALSO ACCEPT ANSWERS FROM OPPOSITE PERSPECTIVE: RURAL AREAS/FARMLAND/FORESTS]
(ANY TWO)

1.3.4 Respiratory problems/asthma/sinusitis✓
Skin irritations (disorder)✓
Heat stroke/cardiac arrest/human discomfort/fatigue ✓
Eye irritations ✓
Allergies ✓
Heat stress (hypertension) ✓ (1 x 1) (1)
(ANY ONE)

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1.3.5 Most pronounced/developed at night because air is subsiding✓✓
High temperatures during the day lead to rising convection currents (and therefore has a greater vertical dimension✓✓
Colder air subsides at night time therefore the pollution dome lies lower at night ✓✓
Fewer urban activities (or examples of) at night time that releases heat over the city centre therefore the pollution dome is compressed/more intensely developed✓✓
[Any TWO] (2 x 2) (4)
[30]

QUESTION 2

2.1

2.1.1 B (width) ✓
2.1.2 C (upper, middle, lower) ✓
2.1.3 A (wide and shallow) ✓
2.1.4 C (rough and uneven) ✓
2.1.5 A (slip-off) ✓
2.1.6 D (concave slope with erosion) ✓ (6x1) (6)

2.2

2.2.1 A-Rectangular ✓
B-Dendritic ✓ (2x1) (2)

2.2.2 **Rock structure**
Jointed/faults ✓
Horizontally layered ✓
[ANY ONE]

Rock type
Igneous ✓
Sedimentary ✓
[ANY ONE] (1+1) (2)

2.2.3 Tributaries join the main river at acute angles ✓✓
Tributaries resembles the branches of a tree ✓✓
[ANY ONE] (1x2) (2)

2.2.4 4th (order) ✓✓ (1x2) (2)

2.2.5 Low ✓ (1x1) (1)

2.2.6 Higher ✓ (1x1) (1)

2.2.7 The steeper slope (gradient) promotes runoff (cuts more river channels)✓✓(1x2) (2)

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3.1

2.3.1 Lower ✓ (1x1) (1)

2.3.2 (Natural) levee✓ (1x1) (1)

2.3.3 Forms on the banks of rivers that have been subjected to repeated flooding. ✓✓
After the floods waters have receded it leaves behind gravel, sand and silt which builds up to form raised banks called a levee. ✓✓ (2x2) (4)

2.3.4 Reduces flooding of the flood plain and therefore loss of crops and equipment. ✓✓
It prevents fertile soil from the floodplain washing back into the river. ✓✓
(ANY ONE) (1x2) (2)

2.3.5 Braided stream. ✓ (1x1) (1)

2.3.6 Distributaries. ✓ (1x1) (1)

2.3.7 The gentle gradient in the lower course decreases river flow ✓✓
The slow flowing river deposits its load within its channel. ✓✓
(ANY ONE) (1x2) (2)

[30]

GRAND TOTAL: 60

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