BEDOK SOUTH SECONDARY SCHOOL
END-OF-YEAR EXAMINATION 2022

1EXP

CANDIDATE NAME			
CLASS		REGISTER NUMBER	

GEOGRAPHY

6 October 2022

1 hour 30 minutes

Candidates to answer in the Question Booklet.

READ THESE INSTRUCTIONS FIRST

Write your class, index number and name on the work you hand in.
Write in dark blue or black ink on both sides of the paper.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer all questions.
Write your answers in the spaces provided in the Question Booklet.

The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
Section A	**/ 5**
Section B	**/ 40**
Total	**/ 45**

Setter: Ms Nadia Ramli

Section A

1. Study Fig. 1, which shows a world map and answer questions 1(a) to 1(d).

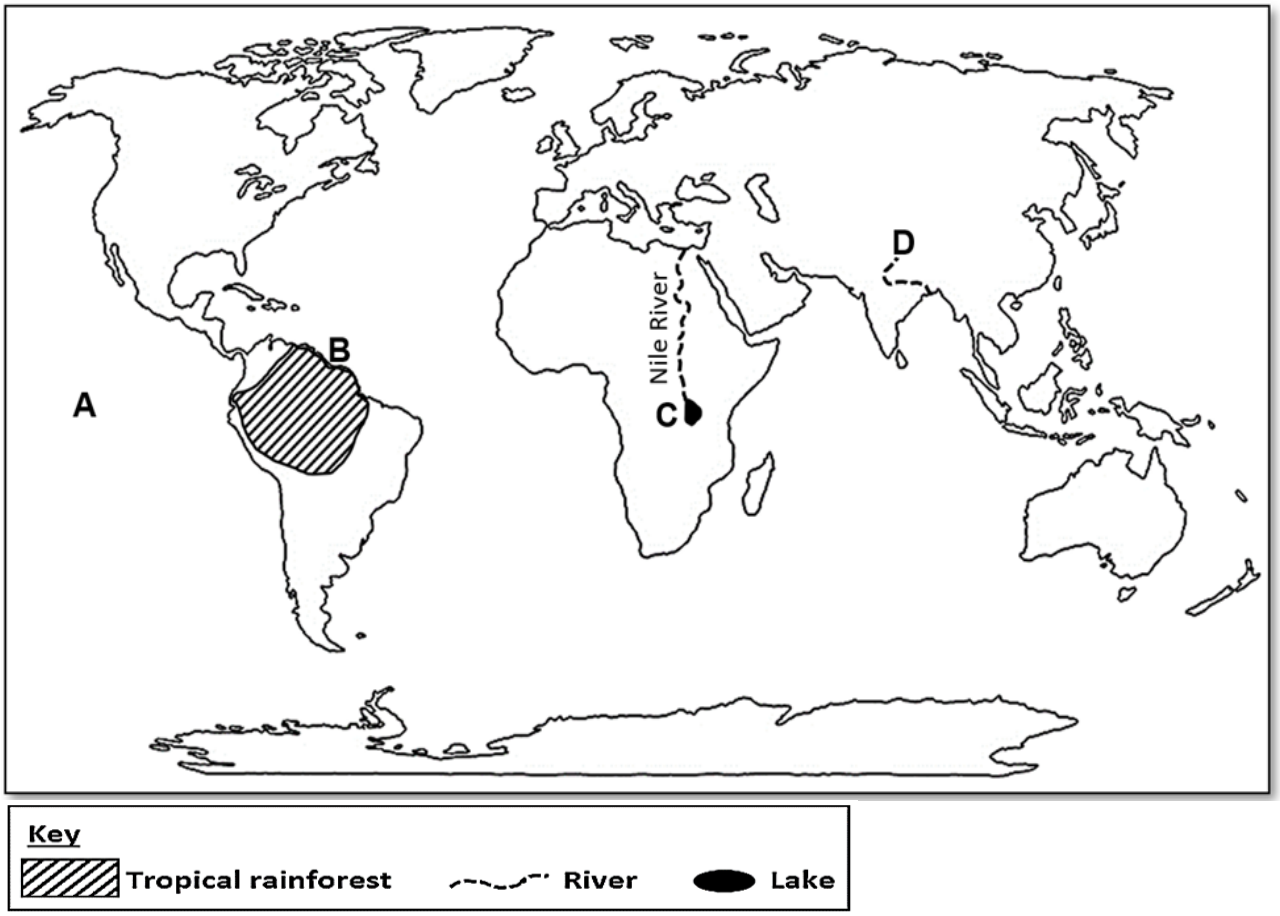


Fig. 1

(a) Identify the ocean labelled A. [1]

Ocean A: _____

(b) Identify the tropical rainforest labelled B and the continent that it is located in. [2]

Tropical rainforest B: _____

Continent: _____

(c) Identify the lake labelled C. [1]

Lake C: _____

(d) Identify the river labelled D. [1]

River D: _____

Section B

2(a) Study Fig. 2, which shows a diagram of the hydrological cycle of a catchment. A catchment refers to an area that receives water, and also contributes water to rivers.

The hydrological cycle of a catchment

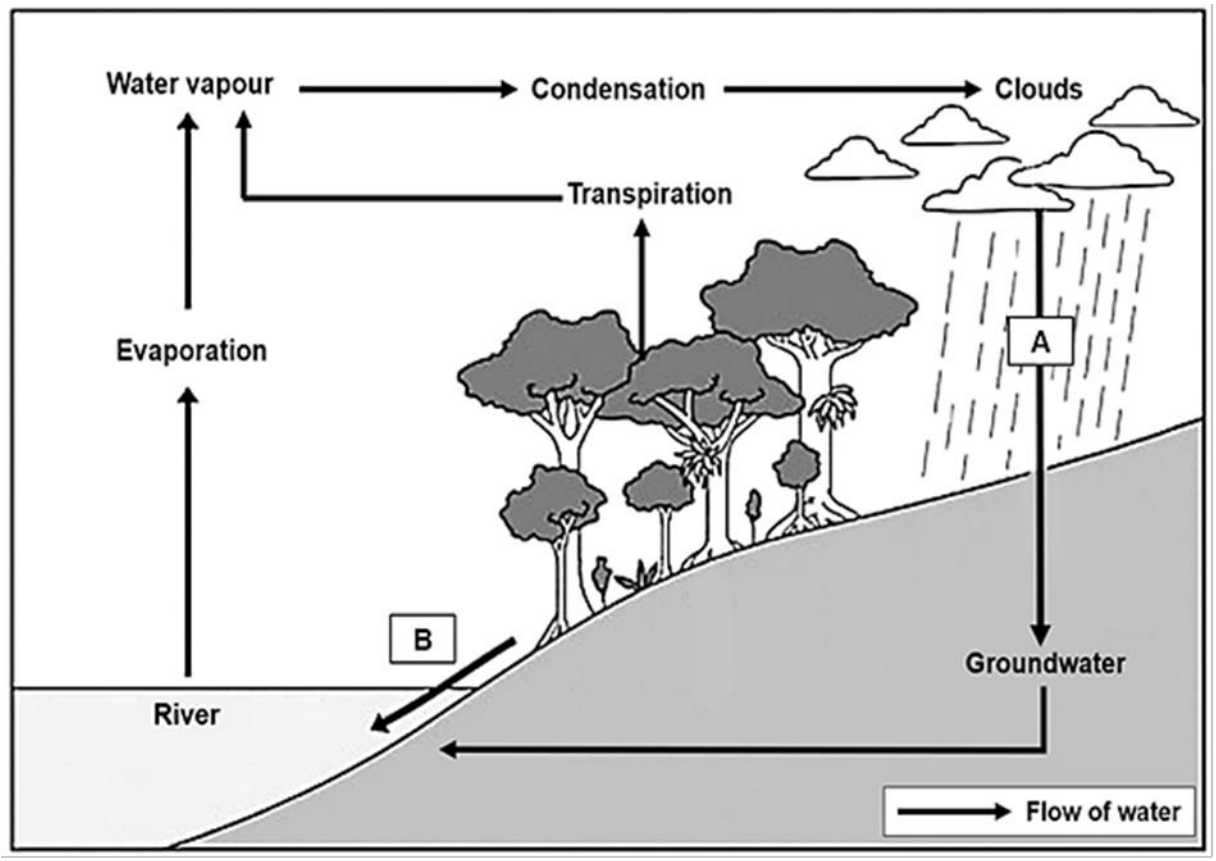


Fig. 2

(i) Using Fig. 2, describe processes A and B. [2]

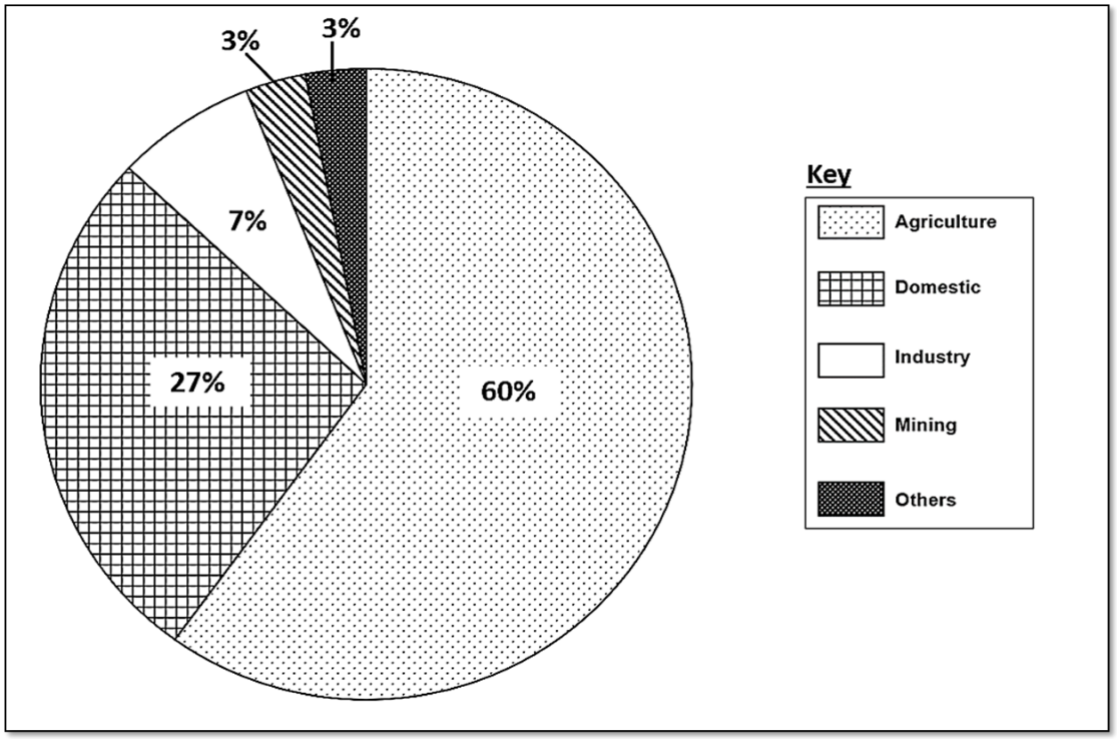
[Turn Over

(ii) Explain how a water surplus can occur in a catchment. [2]

(iii) Is water a renewable or non-renewable resource? Explain your answer. [2]

(b) Study Fig. 3, which is a pie chart showing the different uses of water for South Africa in 2013.

Uses of water in South Africa, 2013



Adapted from: https://www.researchgate.net/figure/4-Pie-chart-of-South-Africas-water-use-in-2013

Fig. 3

(i) With reference to Fig. 3, which human activity uses the most water? [1]

(ii) With reference to Fig. 3, state the percentage of water used for domestic purposes. [1]

(iii) Describe one use of water for industries. [1]

(c) Study Fig. 4, which shows how irresponsible farming can affect water quality and aquatic life.

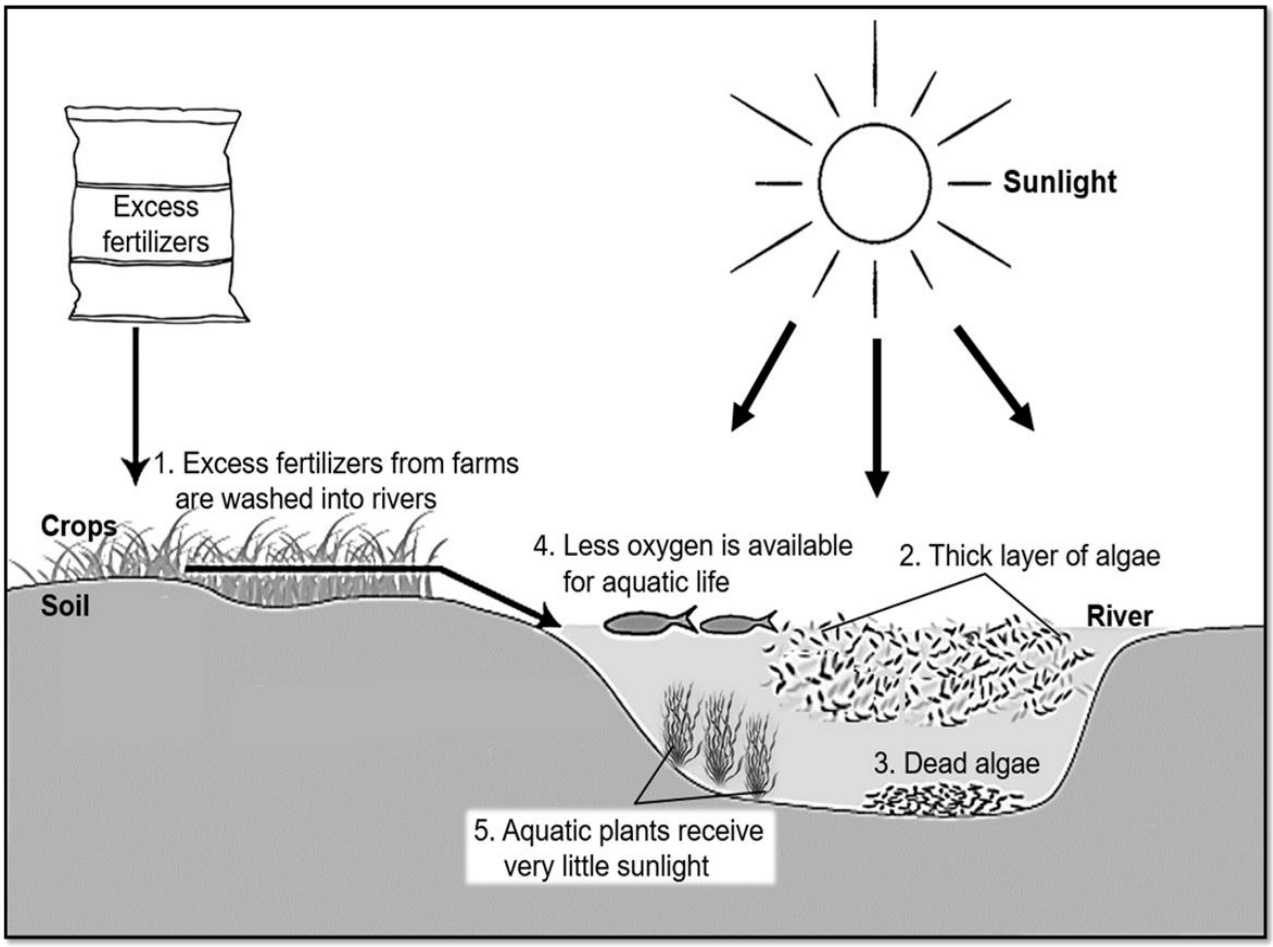


Fig. 4

With the help of Fig. 4, explain the impacts of farming on aquatic life. [4]

(d) Study Photograph A, which shows an area in China which has been affected by a drought.

Retrieved from: https://www.asianews.it/news-en

Photograph A

With the help of Photograph A, explain why droughts occur. [3]

(e) Study Fig. 5, which gives information on one of the two remaining water agreements between Singapore and Malaysia.

1990 Water Agreement between Singapore and Malaysia

- Singapore can draw 250 million gallons of water from the Johor River every day.
- Singapore pays rent at a standard rate of *3 *sen* per 1, 000 gallons of raw water drawn
- Singapore provides Johor with treated water every day, up to 2% of the water supplied to Singapore
- Agreement expires in 2061

**3 sen is equivalent to Sgd $0.0092*

Fig. 5

With reference to Fig. 5 and other information you have studied, describe and evaluate the strategy used by Singapore to sustainably manage its water resources. [4]

Description:

Advantage:

Disadvantage: _____

3(a) Study Fig. 6, which shows the climate graph of a location which has suitable temperature and rainfall conditions for the growth of tropical rainforests.

Climate graph of a location

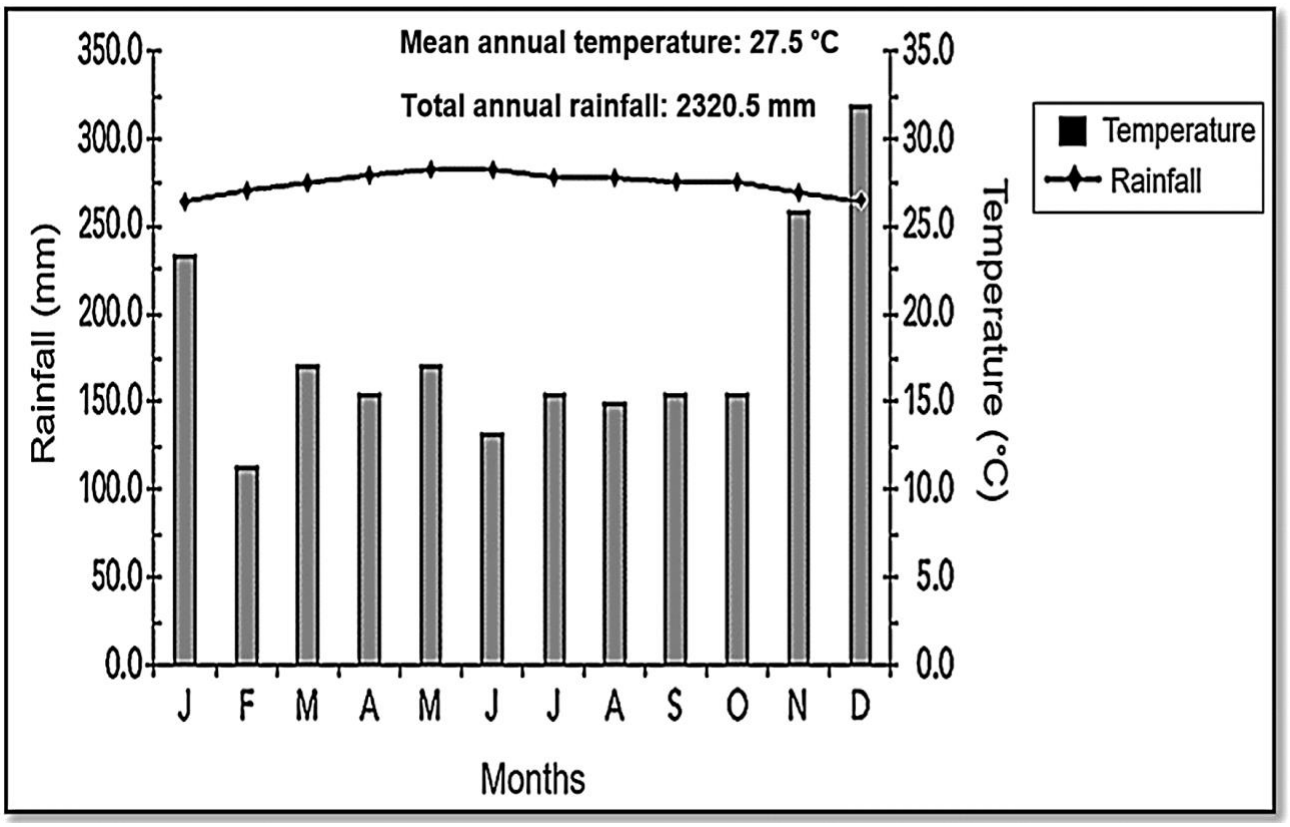


Fig. 6

With the help Fig. 6, describe the average temperature and rainfall conditions suitable for tropical rainforests to grow. [3]

(b) Study Fig. 7 which shows the vertical structure of a tropical rainforests.

Vertical structure of a tropical rainforest

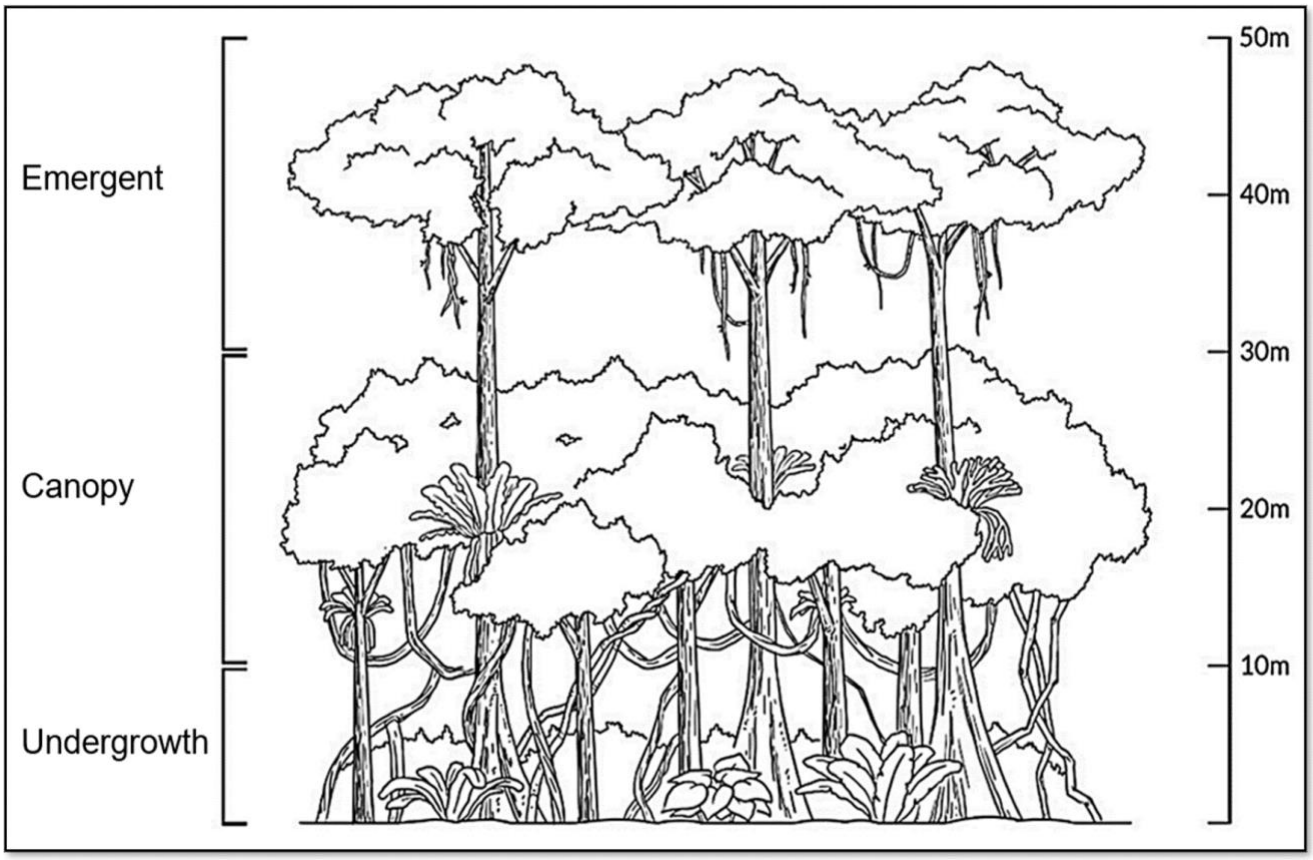


Fig. 7

(i) With the help of Fig. 7, describe **a** characteristic of the undergrowth layer and **a** characteristic of the canopy layer. [2]

Characteristic of the undergrowth layer: _____

_____

_____

Characteristic of the canopy layer: _____

_____

_____

[Turn Over

(ii) Explain one way leaves of tropical rainforest plants have adapted to the climate. [2]

(c) Study Fig. 8, which shows some species of mangroves near a coast.

Mangroves near a coast

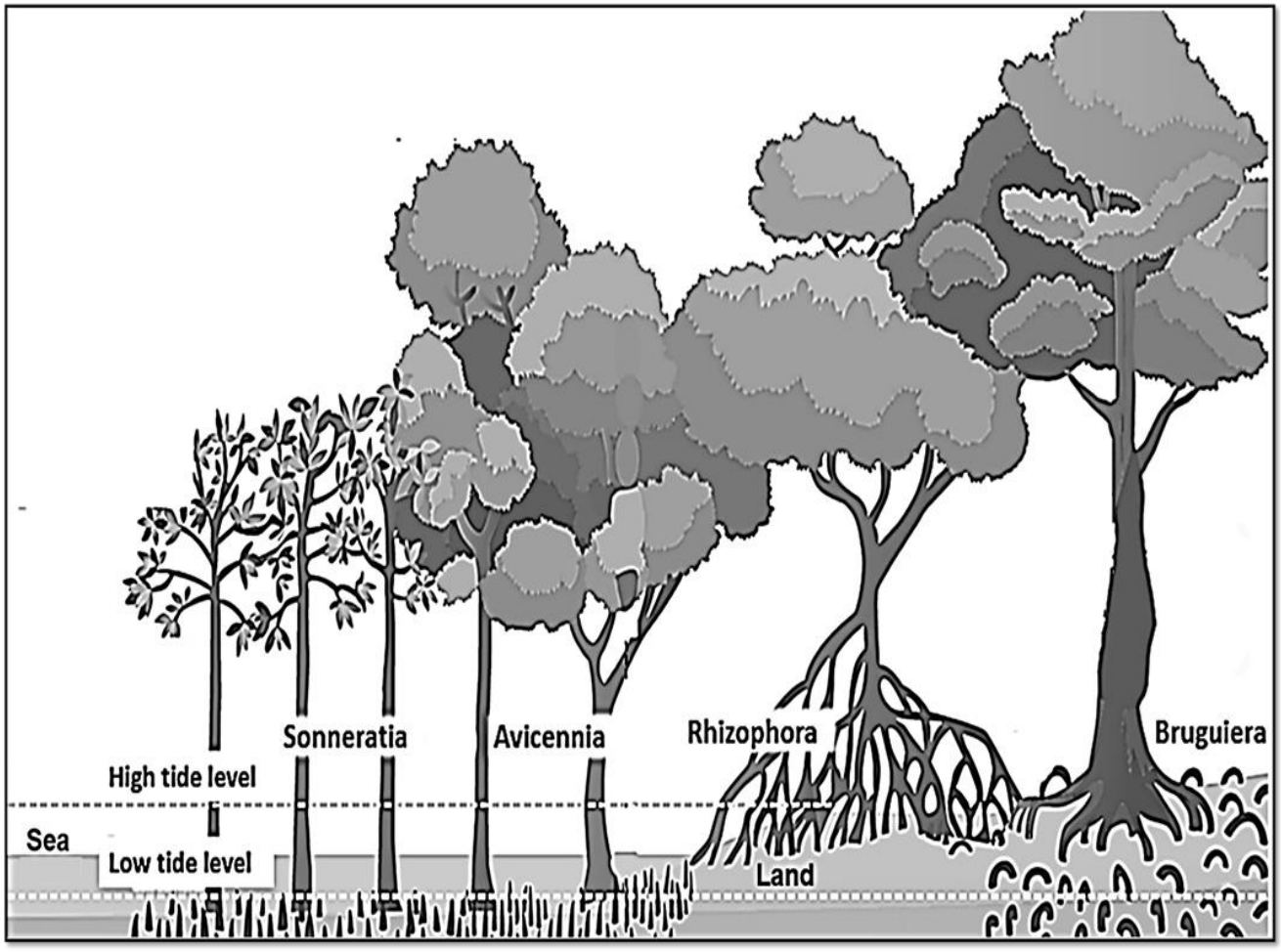


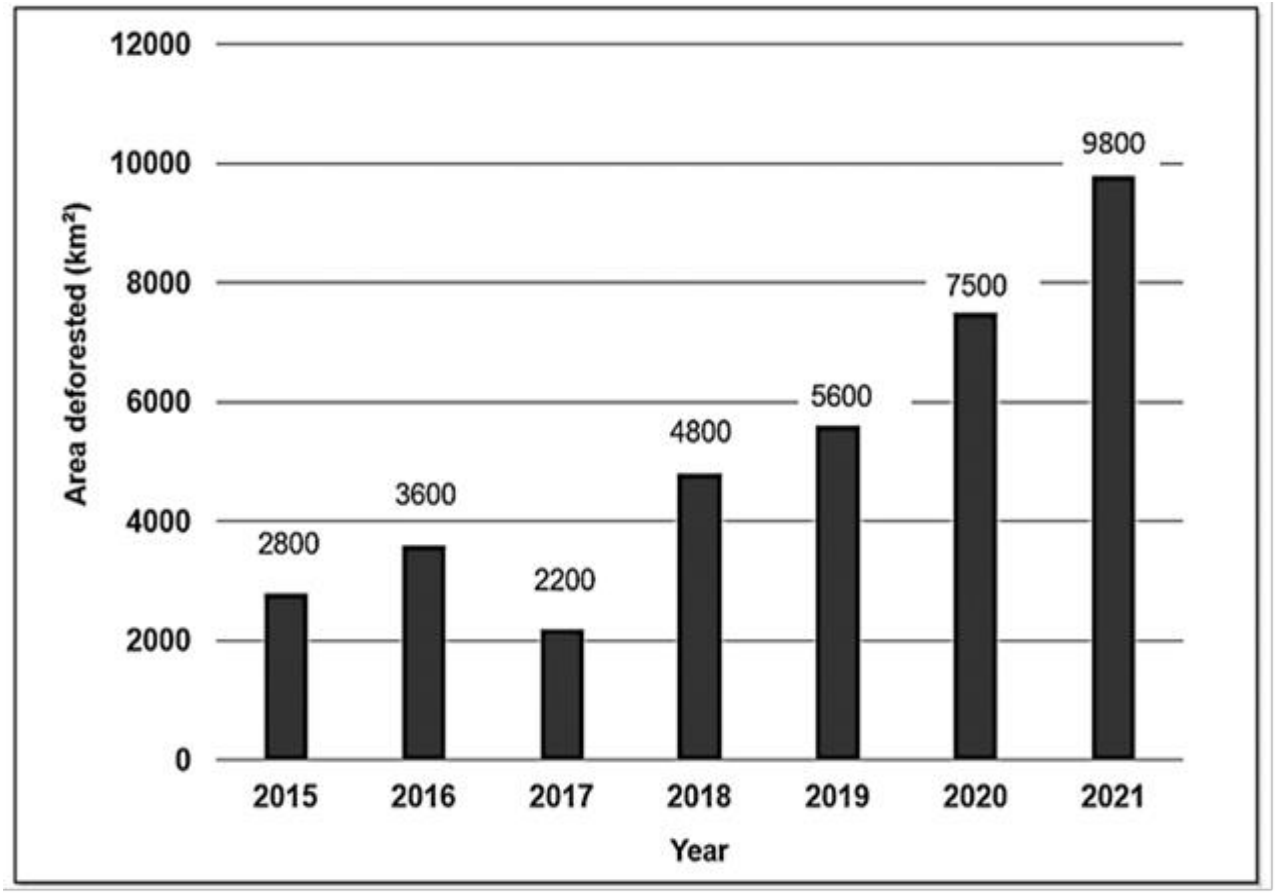
Fig. 8

With reference to Fig. 8 and other information you have studied, explain how mangroves adapt to the coastal environment. [3]

(d) Describe how mangroves help to prevent coastal erosion. [3]

[Turn Over

(e) Study Fig. 9, which is a graph showing the area deforested in the Brazilian rainforest from 2015 to 2021.



Retrieved from: https://desdemonadespair.net/2021/11

Fig. 9

With reference to Fig. 9, describe the changes in the area deforested in the Brazilian rainforest from 2015 to 2021. [3]

(f) Explain how deforestation can lead to the enhanced greenhouse effect. [4]

End of Paper

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Answer Scheme

[Turn Over

Section A

1. Study Fig. 1, which shows a world map and answer questions 1(a) to 1(d).

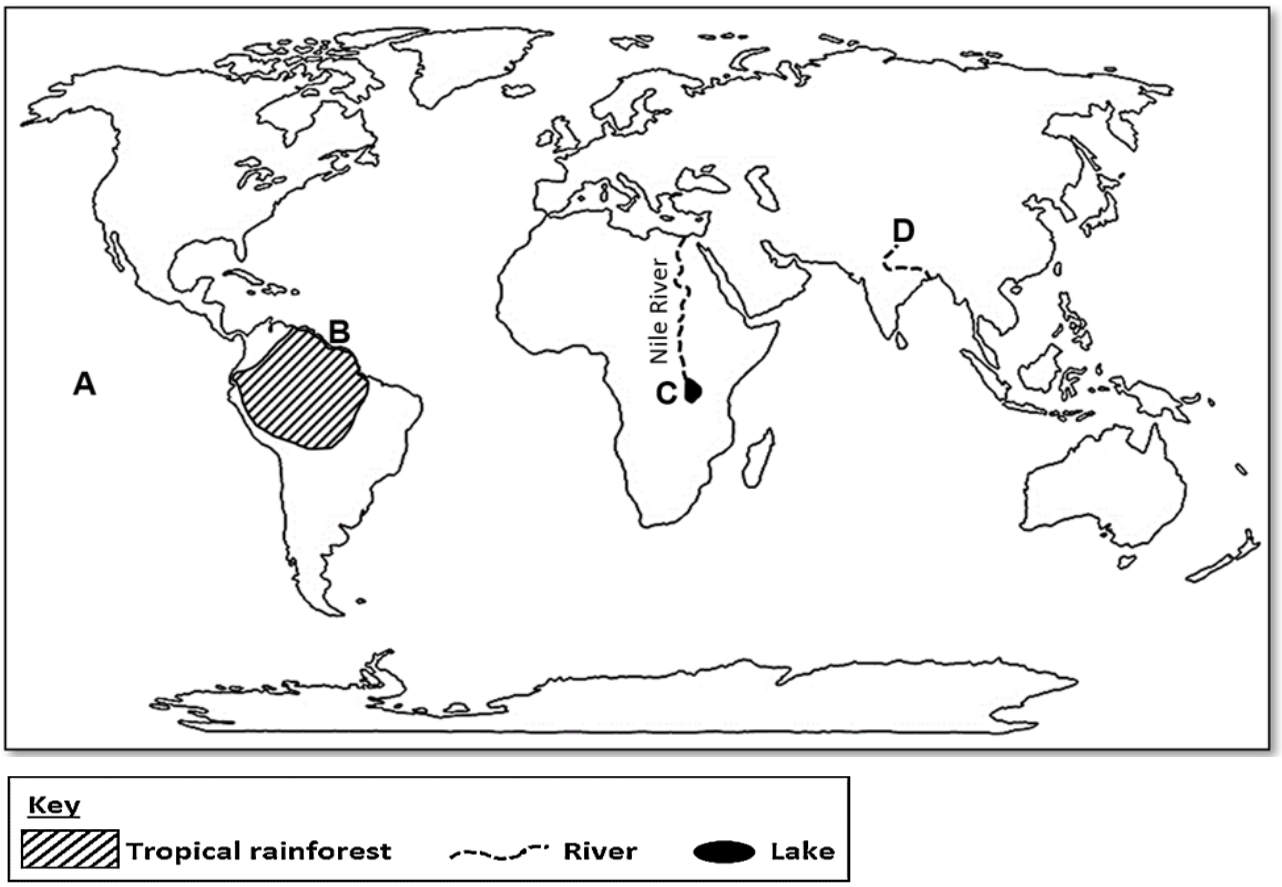


Fig. 1

(a) Identify the ocean labelled A. [1]

Ocean A: Pacific Ocean

(b) Identify the tropical rainforest labelled B and the continent that it is located in. [2]

Tropical rainforest B: Amazon Rainforest

Continent: Amazon rainforest

(c) Identify the lake labelled C. [1]

Lake C**:** Lake Victoria

(d) Identify the river labelled D. [1]

River D: Ganges River

Section B

2(a) Study Fig. 2, which shows a diagram of the hydrological cycle of a catchment. A catchment refers to an area that receives water, and also contributes water to rivers.

The hydrological cycle of a catchment

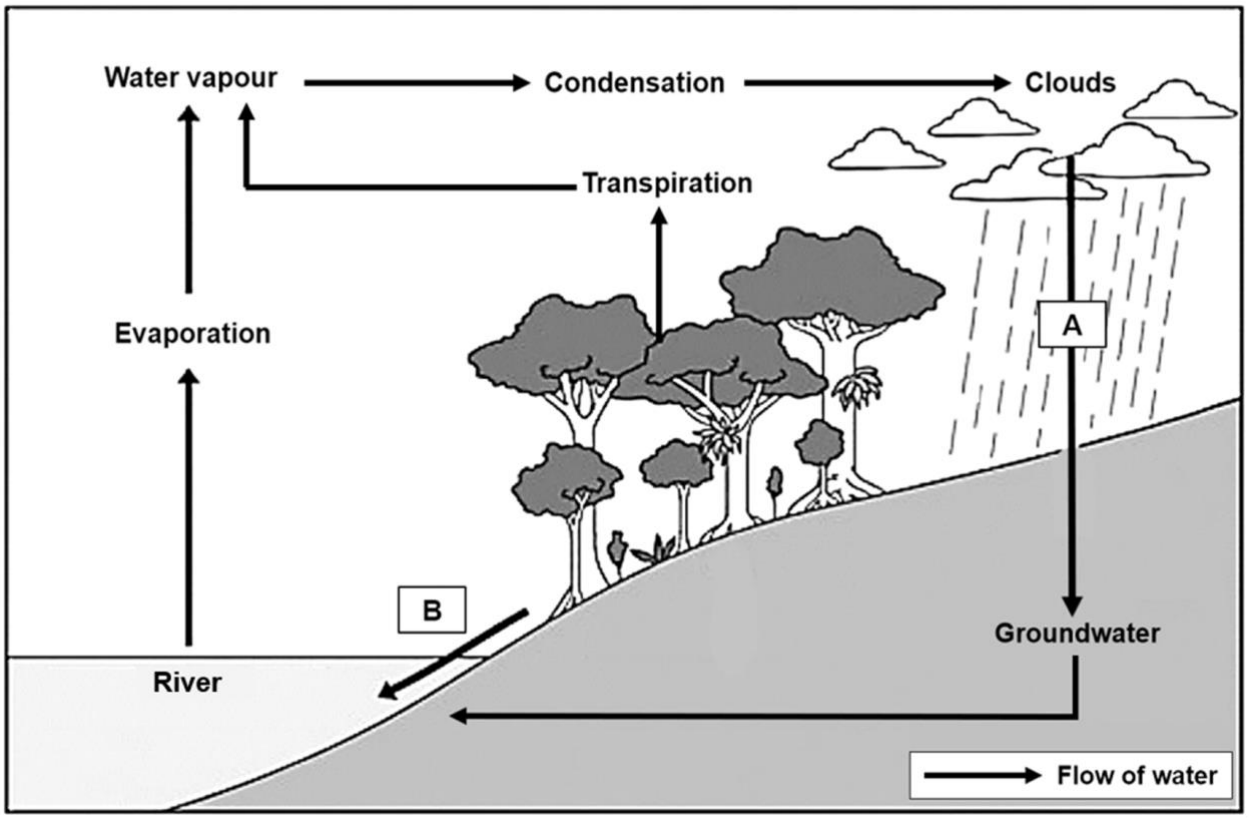


Fig. 2

(i) Using Fig. 2, describe processes A and B. [2]

- Process A- Precipitation is a process where water falls to the earth's surface as rain/hail/snow
- Process B- Surface runoff is a process where water flows from the highlands and over the ground surface into rivers
- 2 points @ 1 mark each

(ii) Explain how a water surplus can occur in a catchment. [2]

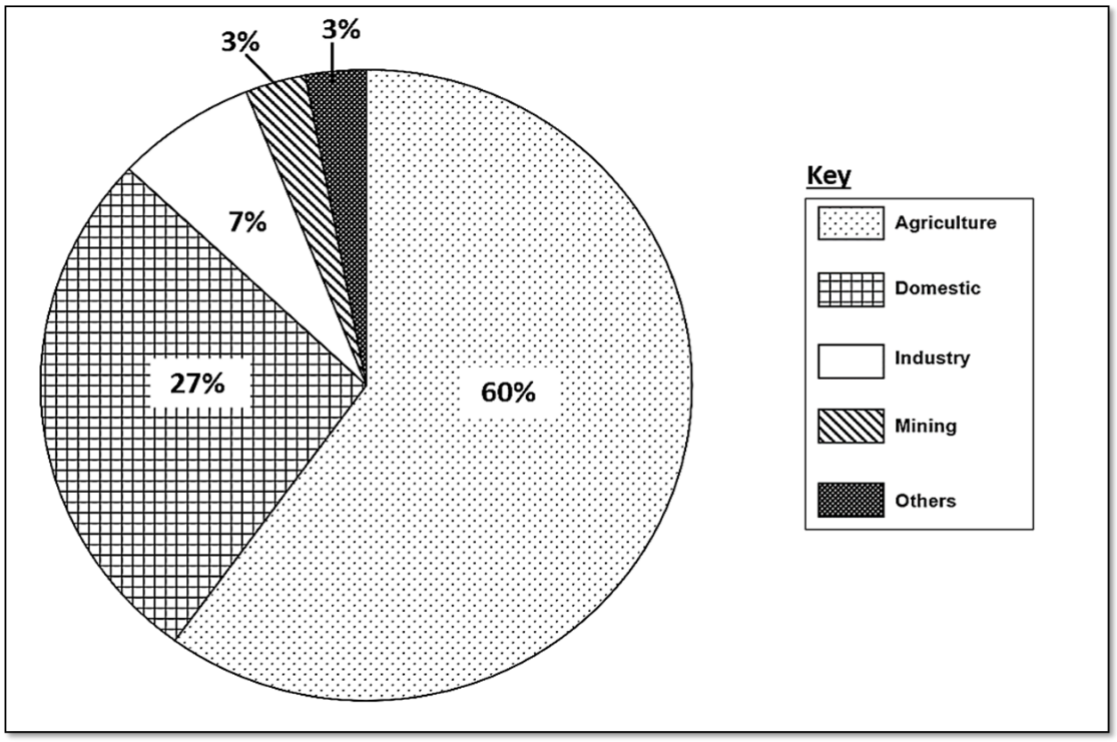
- Water surplus occurs when there is more input than output in a catchment
- For example, water surplus occurs when a catchment receives more precipitation than evaporation/ surface runoff
- 2 points @ 1 mark each

(iii) Is water a renewable or non-renewable resource? Explain your answer. [2]

- Water is a renewable resource
- Because it is replenished naturally by the processes in the hydrological cycle
- 2 points @ 1 mark each

(b) Study Fig. 3, which is a pie chart showing the different uses of water for South Africa in 2013.

Uses of water in South Africa, 2013



Adapted from: https://www.researchgate.net/figure/4-Pie-chart-of-South-Africas-water-use-in-2013

Fig. 3

(i) With reference to Fig. 3, which human activity uses the most water? [1]

- Agriculture

(ii) With reference to Fig. 3, state the percentage of water used for domestic purposes. [1]

- 27%

(iii) Describe one use of water for industries. [1]

- To cool equipment in factories and power plants as they generate a lot of heat.
- To generate electricity in power plants as it passes through turbines.
- As a cleaning agent in water fabrication/ process of creating components for the electrical circuitry found in computers and mobile phones
- Any 1 point @ 1 mark each

(c) Study Fig. 4, which shows how irresponsible farming can affect water quality and aquatic life.

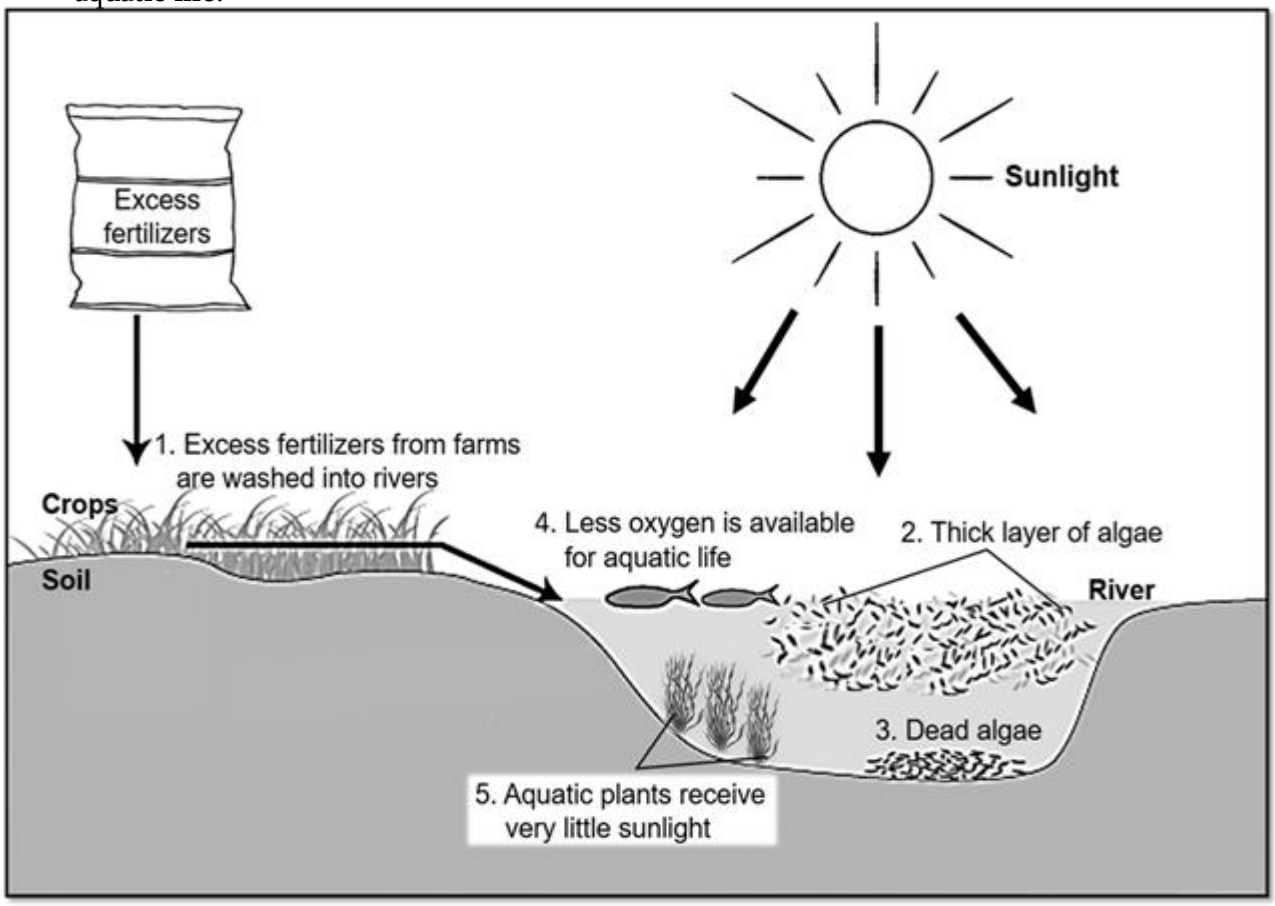


Fig. 4

With the help of Fig. 4, explain the impacts of farming on aquatic life. [4]

- Excess fertilizers used on farms that get washed into rivers by rain, provide additional nutrients for algae to grow rapidly.
- When the algae eventually die, they are decomposed by bacteria, which take in oxygen during the process.

- As a result, less oxygen remains in the water, causing aquatic animals like fish to die.
- Also, the thick layer of algae on the surface of the river blocks sunlight from reaching aquatic plants in the river, and hence these plants are unable to make food through photosynthesis and will eventually die.
- 4 points @ 1 mark each

(d) Study Photograph A, which shows an area in China which has been affected by a drought.

Retrieved from: https://www.asianews.it/news-en

Photograph A

With the help of Photograph A, explain why droughts occur. [3]

- When an area receives a lack of rainfall/ very litter rain over a long period of time.
- There is too little rainwater to replenish the river/ water bodies.
- The water level in the river/ water bodies drops gradually, until it eventually runs dry, causing droughts.
- 3 points @ 1 mark each.

(e) Study Fig. 5, which gives information on one of the two remaining water agreements between Singapore and Malaysia.

1990 Water Agreement between Singapore and Malaysia

Singapore can draw 250 million gallons of water from the Johor River every day.
Singapore pays rent at a standard rate of *3 *sen* per 1, 000 gallons of raw water drawn
Singapore provides Johor with treated water every day, up to 2% of the water supplied to Singapore
Agreement expires in 2061

**3 sen is equivalent to Sgd $0.0092*

Fig. 5

With reference to Fig. 5 and other information you have studied, describe and evaluate the strategy used by Singapore to sustainably manage its water resources. [4]

Description:

- With reference to Fig. 5, Singapore sustainably manages its water resources by importing water from Malaysia.
- Importing water enables countries like Singapore who experience water shortage, to buy water from countries that have excess water supply **Or**

Under the 1990 water agreement between Singapore and Malaysia, Singapore is able to draw 250 million gallons of water from Johor River every day.

Advantage

- Importing water does not require land to increase water supply, so land can be developed for other uses. **Or**

As Singapore pays rent at a standard rate of $0.0092, the cost of importing water is cheaper than using other strategies such as improving water technologies to sustainably manage water resources.

Disadvantage:

- The water agreement with Malaysia will eventually expire and Singapore and by then, Singapore will need to rely on other management strategies to ensure that it can produce enough water on its own to meet its people's needs.

- 4 points @ 1 mark each

- For the description of strategy: Award 1 mark for identification of strategy and 1 mark for elaboration of each technology.
- 1 mark is awarded for each explanation of an advantage and a disadvantage
- Accept any other plausible answers

3(a) Study Fig. 6, which shows the climate graph of a location which has suitable temperature and rainfall conditions for the growth of tropical rainforests.

Climate graph of a location

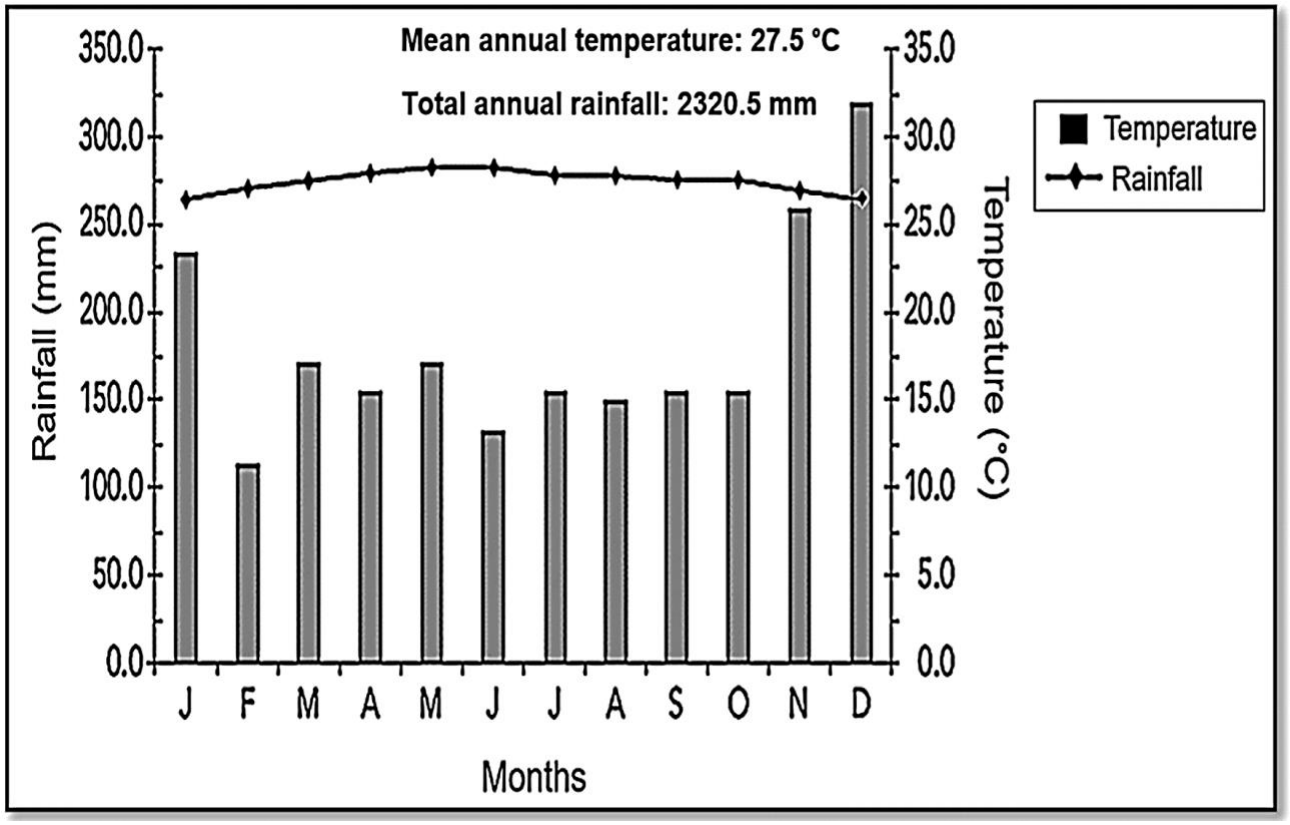


Fig. 6

With the help Fig. 6, describe the average temperature and rainfall conditions suitable for tropical rainforests to grow. [3]

- High mean annual temperature of 27.5 °C.
- High total annual rainfall of about 2000 to 4500 mm (Accept: 2320.5 mm).
- There is rainfall throughout the year, with no distinct wet or dry seasons.
- 3 points @ 1 mark each

(b) Study Fig. 7 which shows the vertical structure of a tropical rainforests.

Vertical structure of a tropical rainforest

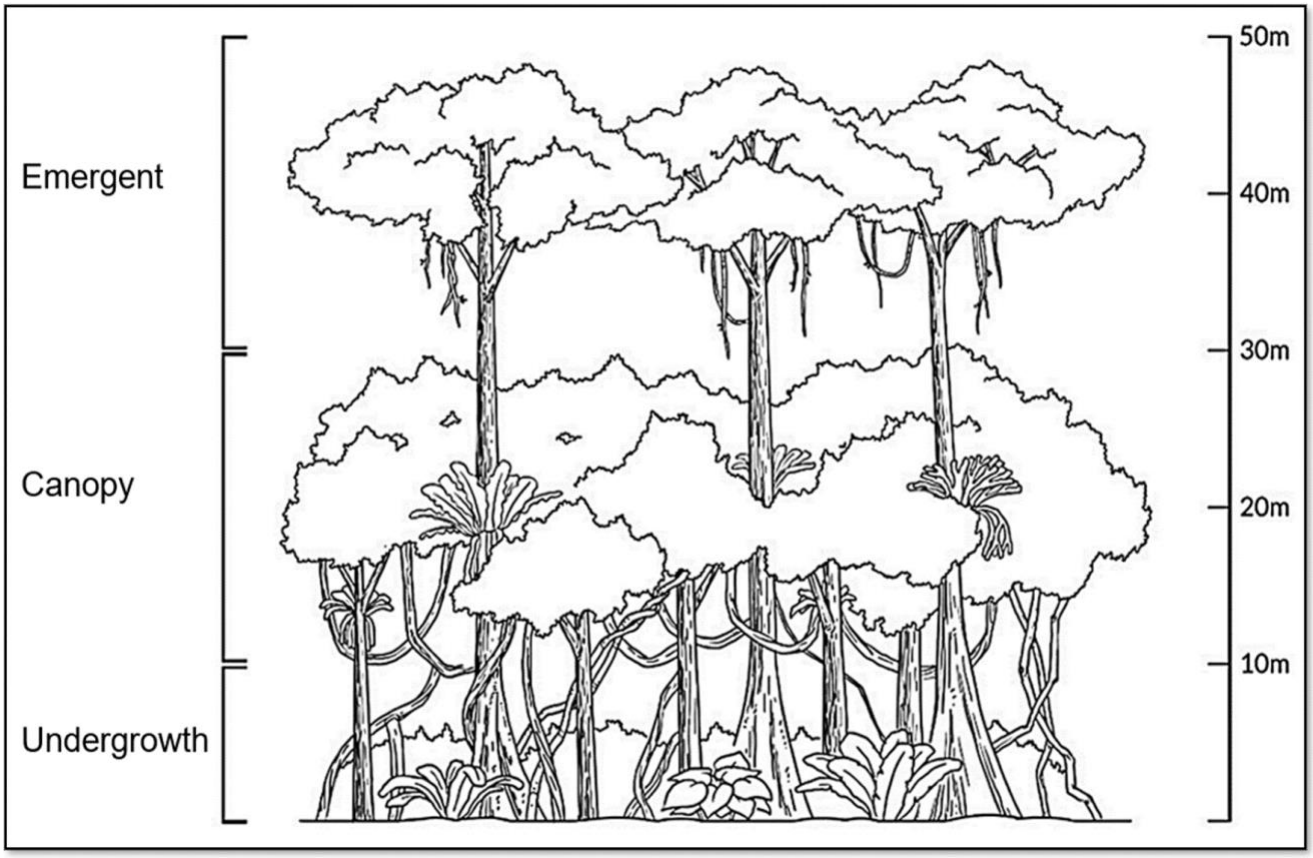


Fig. 7

(i) With the help of Fig. 7, describe **a** characteristic of the undergrowth layer and **a** characteristic of the canopy layer. [2]

Characteristic of the undergrowth layer:

● As the underground layer is found beneath the canopy layer,very little sunlight is able to reach this layer.

● Vegetation is sparse due to the lack of sunlight, except where there are gaps in the canopy.

Characteristic of the canopy layer:

● Trees in this layer grow to about 20 – 30 metres in height and they grow very close to one another.

● The crowns of the trees in this layer interlock to form a thick and near-continuous mass of branches & leaves

● The canopy layer prevents 97-98% of the sunlight that the top of the tropical rainforest receives from passing through to reach the forest floor.

- 2 points @ 1 mark each
- Accept any one of the above points for each characteristic

(ii) Explain one way leaves of tropical rainforest plants have adapted to the climate. [2]

- Broad leaves.
- The large surface area enables the plant to absorb as much sunlight as possible in order to make food for its own survival and growth. **Or**

- Waxy leaves.
- The glossy leave surface helps the plant to reduce the amount of water vapour that it loses to the atmosphere as a result of the high temperatures. **Or**

- Drip tips/ Small narrow tips that point downwards
- Rainwater that falls onto them flow off quickly, preventing the growth of fungi or bacteria on them.

- 2 points @ 1 mark each

(c) Study Fig. 8, which shows some species of mangroves near a coast.

Mangroves near a coast

Fig. 8

With reference to Fig. 8 and other information you have studied, explain how mangroves adapt to the coastal environment. [3]

- Mangrove forests exhibit horizontal zonation where each horizontal zone is dominated by a dominant species of plants which have developed special features to adapt to the coastal environment at each zone.
- Mangrove plants in each horizonal zone have different types of aerial roots such as cone roots, pencil roots, prop roots or kneed roots to adapt to the different soil conditions (which are waterlogged, poor in oxygen and also soft and unstable) in the coastal environment.
- These aerial roots of mangrove plants grow partially above the soil surface to enable them to take in oxygen directly from the air when they are exposed during low tide.
- Aerial roots of mangrove plants help to anchor mangrove plants to the soft soil, thus preventing them from being uprooted and washed away by strong waves.

● The cone roots of the *Sonneratia* and the pencil roots of the *Avicennia* have grow vertically upwards and partially above the soil surface to enable them to take in oxygen directly from the air when they are exposed during low tide.
● *Rhizophora* have curved prop roots that form a broad base around the plants. These roots help the breathe and provide plants with support.
● *Bruguiera* have knee-bend roots which help to anchor the plant as well as collect sediment behind the roots. These provide plants with support, preventing them from being uprooted away by strong waves.
● Some mangrove species such as the *Bruguiera* have salt-excluding roots which deny the intake of salt using their roots. This prevents salt from building up within the plant.
● *Avicennia* plants have salt-secreting leaves which enable them to remove salt from saline water that their roots have absorbed. This prevents salt from building up within the plant.
● The leaves of the *Sonneratia* pants deposit excess salt in **older** leaves which they eventually **shed**. The removal of salt in this manner helps to prevent salt from building up within the plant

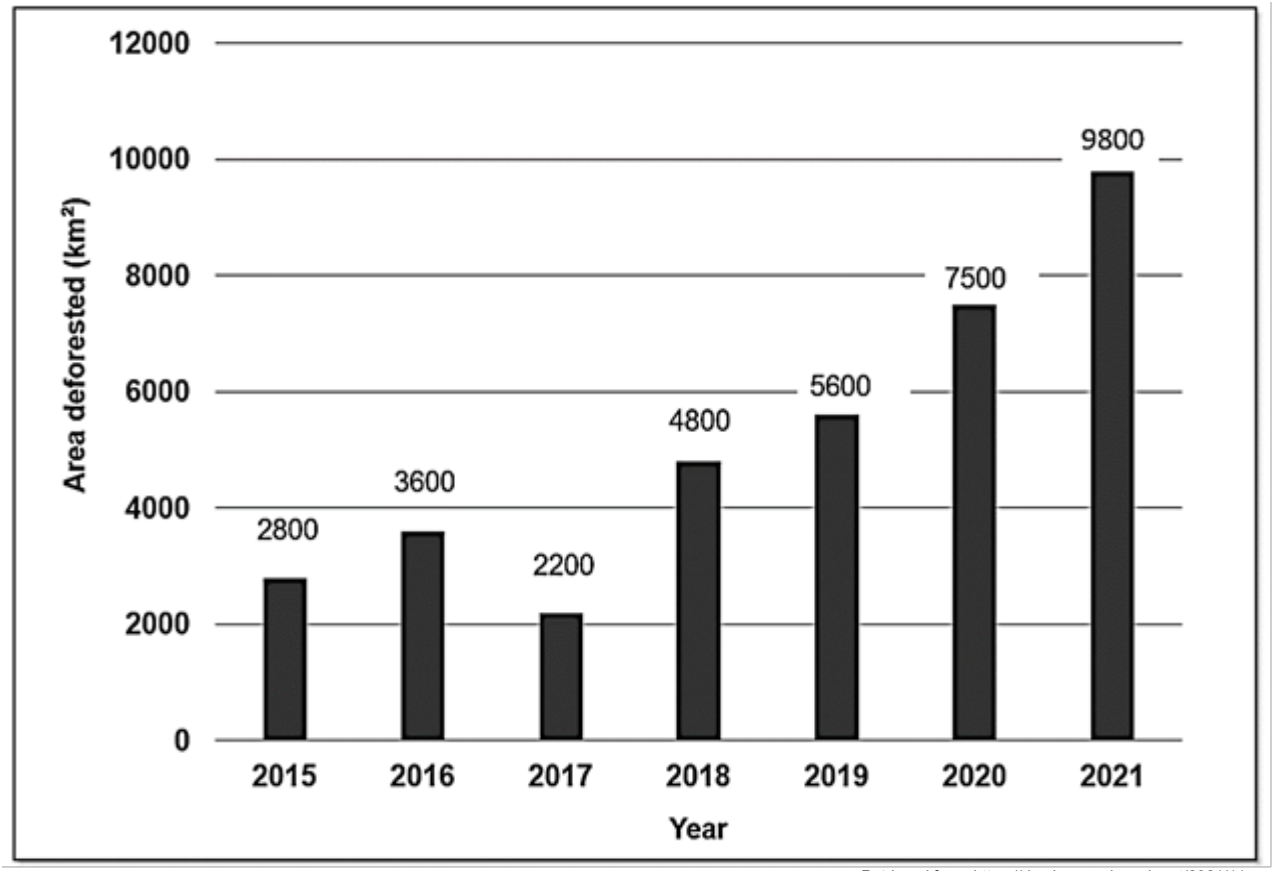
● Accept any 3 points @ 1 mark each

(d) Describe how mangroves help to prevent coastal erosion. [3]

● The dense root systems of mangrove plants help to trap and stabilise loose sediments on the coast.
● The sediments are less likely to be washed away by waves, currents and tides.
● The roots, trunks and branches of mangrove plants cause friction with waves hitting the coast and waves lose energy, reducing coastal erosion.
● 3 points @ 1 mark each

(e) Study Fig. 9, which is a graph showing the area deforested in the Brazilian rainforest from 2015 to 2021.

Area deforested in the Brazilian Amazon rainforest from 2015 to 2021



Retrieved from: https://desdemonadespair.net/2021/11

Fig. 9

With reference to Fig. 6, describe the changes in the area deforested in the Brazilian rainforest from 2015 to 2021. [3]

- From 2015 t0 2016, the area deforested in Brazil increased from 2800 km² to 3600 km².
- From 2016 to 2017, the area deforested in Brazil decreased from 3600 km² to 2200 km².
- The area deforested in Brazil increased steadily from 2018 to 2021 from 2200 km² to 9800km².
- 3 points @ 1 mark each

(f) Explain how deforestation can lead to the enhanced greenhouse effect. [4]

- When trees are cut down, carbon stored in the plants and soil in forests are released into the atmosphere.

- Due to deforestation, there are fewer trees to take in carbon dioxide in the atmosphere during photosynthesis.
- Hence deforestation causes greater amounts of carbon dioxide in the to be released into the atmosphere.
- Greater amounts of carbon dioxide in the atmosphere will trap more heat released by the Earth's surface, leading to a rise in global temperatures.
- 4 points @ 1 mark each

End of Paper