



Paya Lebar Methodist Girls' School (Secondary)
End-of-Year Examination 2025
Secondary 1
Marking Scheme

Subject : Geography (G3)

Date 29 September 2025

Duration : 1 hour 30 minutes

Name : _____ () Class : _____ (TG _____)

Teacher : _____

Instructions to Candidate:

Do not open this booklet until you are told to do so.

Write your answers in the space provided in the question booklet.

Write in dark blue or black pen.

Do not use paper staples, paper clips, glue or correction fluid.

You must answer **all** questions.

The number of marks is given in brackets [] at the end of each question or part question. The total marks for this paper is **50**.

FOR TEACHER'S USE	
Question 1 • Water	/30
Question 2 • Tropical Forests	/20
Total	/50

This document consists of **12** printed pages.

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Section A: Water – 30 Marks

- 1 (a) Study Fig. 1.1 which shows a diagram of the hydrological cycle.

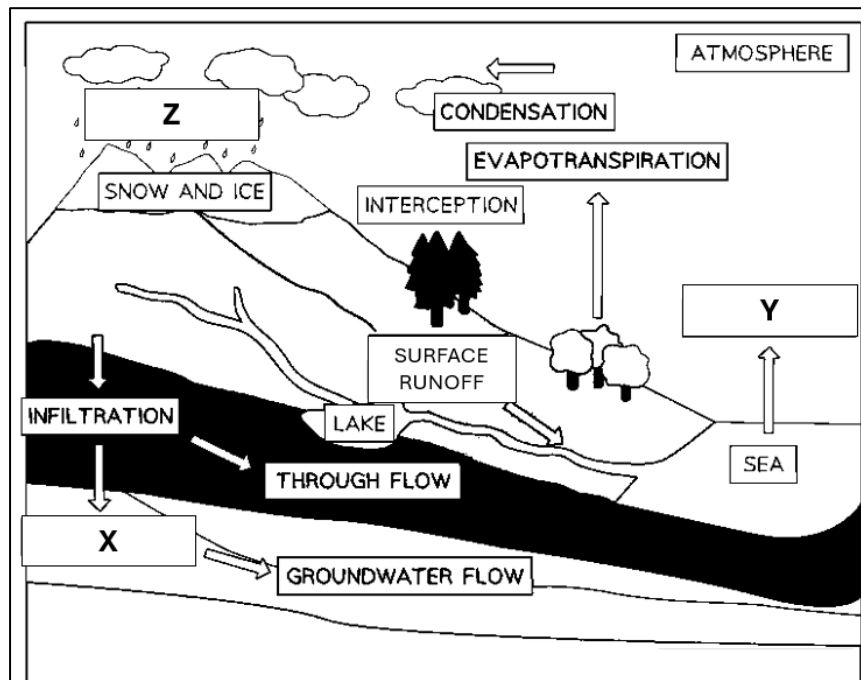


Fig. 1.1

- (i) With reference to Fig. 1.1, identify processes X, Y and Z in the hydrological cycle.

Process X: Percolation [1]

Process Y: Evaporation [1]

Process Z: Precipitation [1]

Answers with slight spelling errors will still be marked as correct.

However, answers like 'procolation, perlocation, procalation', 'evaporistation' were not accepted.

- (ii) Explain how the processes of the hydrological cycle renew Earth's water supply. [4]

- The heat from the sun warms the water in the oceans. Water **evaporates** and rises into the air.
- Water vapour **condenses** into water droplets which gather to **form clouds**.
- When water droplets that form the clouds become too heavy, they **fall as precipitation**.
- Some precipitation **infiltrate** into the ground/**percolates** through the soil layers.

- Precipitation **runs off** the land/ flows away as surface runoff and into the rivers.

4 points @ 1 mark each

Answers must include the words in bold, highlighting the key processes in the hydrological cycle and how they contribute to a renewable water supply.

- (b) Study Fig. 1.2 which shows the percentage of water used for different purposes in six areas of the world.

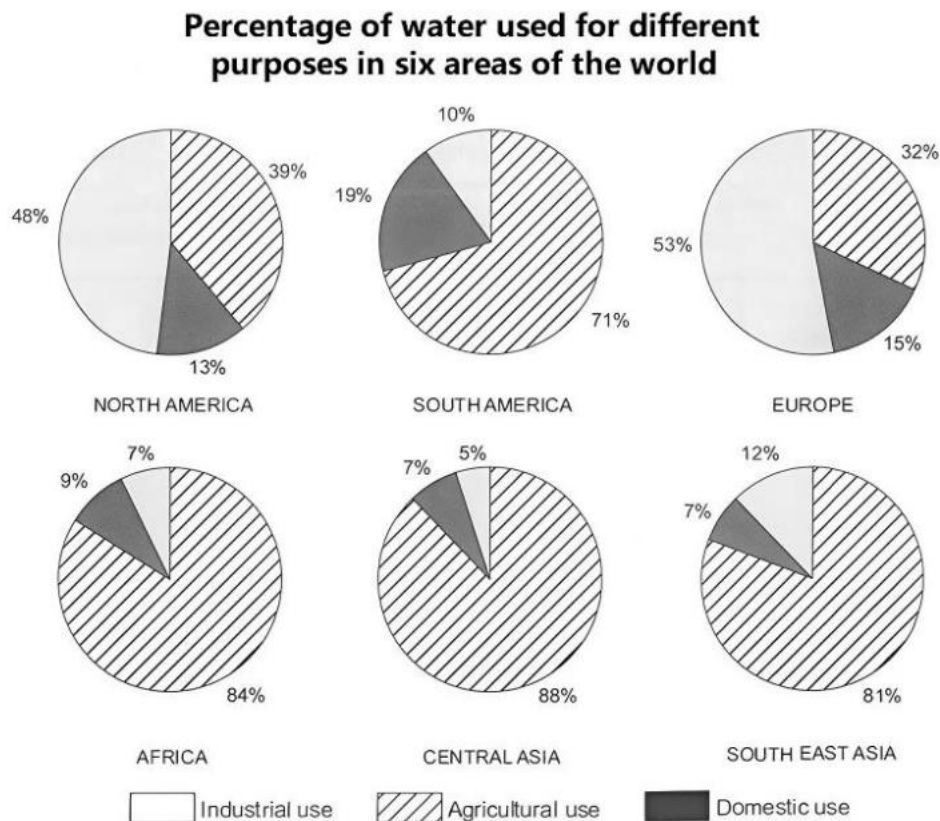


Fig. 1.2

- (i) Using Fig. 1.2, identify the area with the highest percentage of water in agricultural use. [1]

Central Asia [1]

- (ii) Using Fig. 1.2, describe the difference in percentage of water in industrial use between North America and Africa. [1]

- North America uses a higher percentage of water in industrial use, at 48% compared to Africa which has a lower percentage of water in industrial use at 7%. [1]

Answers which indicated that North America uses 41% more water for industrial use are also accepted.

Zero mark will be given if student does not quote the date from Fig. 1.2. Data quoted must also be accurate.

- (iii) Suggest an activity in which water is used domestically. [1]

Showers, Cooking etc [1]

Accept any plausible answer

Answers like 'drinking water', 'cleaning' and washing hands with water are not accepted as they are not activities which are mainly carried out at home (domestic).

- (c) Study Fig. 1.3 which shows percentage of population with access to safe drinking water.

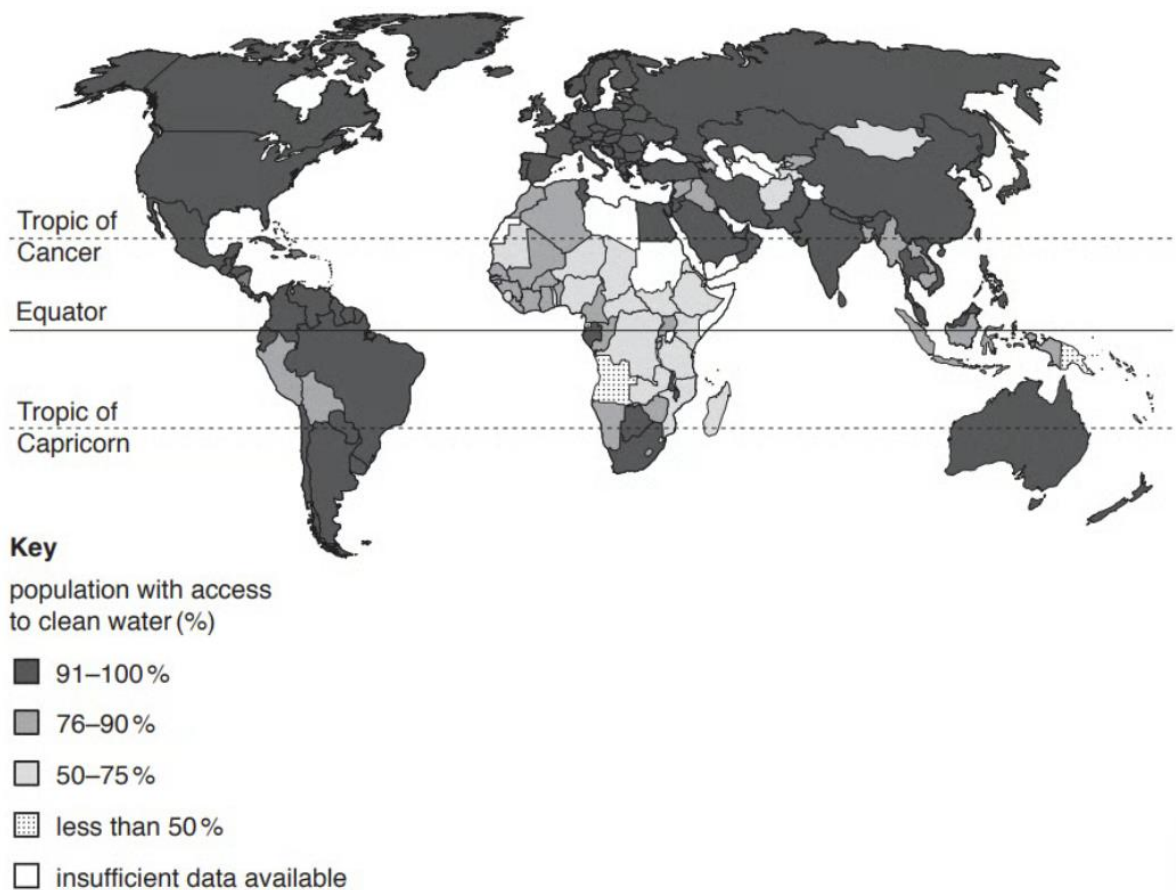


Fig. 1.3

- (i) Using Fig. 1.3, identify two countries where 91% or more of the population have access to clean drinking water. [2]
Canda, USA, China, India etc
Any 2 possible countries at 1 mark each, Max 2 marks

Answers which quoted continents (e.g. North/South America, Asia) are not accepted as question clearly requires students to identify countries.

- (ii) Using Fig. 1.3 describe the distribution of countries where 75% or less of the population have access to clean drinking water. [3]
- Most of these countries are in the continent Africa, with the exception countries like South Africa and Egypt
 - Quite a number of these countries can be found in South East Asia.
 - A few countries like Mongolia and Indonesia can be found in Asia.
 - Many of these countries are near the equator/between the tropic of cancer and tropic of Capricorn

3 points @ 1 mark each

Many students did not do so well for this question as they have not grasped the meaning of distribution – which requires students to identify spatial patterns. Places with high and low concentration of countries where 75% or less of the population have access to clean drinking water.

- (d) Explain how flash floods can occur in highly built-up urban areas. [3]
- When there is exceptionally **heavy rainfall over a short period of time**
 - In built up urban areas, most of the road surfaces are made of concrete, cement or other non porous materials, which **does not allow rainwater to infiltrate the ground**
 - Most of the rainwater that falls onto the ground becomes **surface runoff which quickly floods** low-lying areas.

3 points @ 1 mark each

Answers must include words in bold, which highlight the distinctive features of a flash flood and how it is formed in a built-up urban area. Students are also reminded to use geographical terms such as infiltrate instead of layman terms like 'get absorbed' or 'seep into'

- (e) Fig. 1.4 and 1.5 show human activities which can cause water pollution.



Fig. 1.4



Fig. 1.5

(i) Describe the human activities shown in Fig. 1.4 and 1.5 which can contribute to water pollution. [2]

- Excess fertilisers and pesticides from farms may get washed into rivers by rain providing additional nutrients for algae to grow rapidly.
- Some factories may release untreated or poorly treated toxic chemicals directly into rivers, lakes, or oceans.

2 points @ 1 mark each

Since there are many types of chemical waste, for Fig. 1.5, students must be able to identify that the waste come from factories/production plants or state that it is industrial waste. Answers like 'toxic chemicals', 'waste', 'chemicals' were no accepted.

(ii) Explain how humans and the physical environment would be affected by such water pollution. [5]

- Excess fertilisers in the water bodies may cause **algae bloom**.
- 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 **fish and other aquatic animals to die**.
- Toxic chemicals in the water may contaminate surface and ground water, cause **aquatic plants and animals to die** in polluted waters.
- Some toxins build up in the bodies of animals over time, **moving up the food chain** and affecting **birds, humans, and other predators**
- **Humans may suffer from water borne diseases** from consuming contaminated groundwater.
- **Humans may have insufficient clean drinking water source** due to polluted groundwater source.

Any 5 points @ 1 mark each

Weaker answers tend not to mention about how the use of fertilisers and pesticides can lead to algae bloom and other associated effects. Answers might also not show the chain effect of water pollution on the wider biodiversity.

- (f) Study Fig. 1.6, which is an article on how technology has been used to produce freshwater.

For more than two decades, Singapore's National Water Agency, PUB, has implemented a range of strategies to ensure the nation's long-term water sustainability.

A key initiative involves collecting and treating all wastewater to produce clean, high-quality reclaimed water. This approach has positioned PUB as a global leader in the use of recycled water as a sustainable water source.

Fig. 1.6

- (i) With reference to Fig. 1.6, state the strategy used in Singapore to ensure long-term water sustainability. [1]

NEWater [1]

Also accepted: Improving Water Quality, Improving Water Technologies, Treating/recycling waste water to clean water

Not accepted: Recycling, Renewing water, Reusing water, reverse osmosis

- (ii) Describe one advantage and one disadvantage of using this strategy in Singapore [2]

Advantages:

- NEWater is weather-independent, unlike rain-fed reservoirs, making it a reliable supply during dry seasons or droughts. [1]
- Singapore produces a lot of used water every day from homes and factories. Instead of wasting it, the country can clean and reuse it to make NEWater. [1]

Disadvantages:

- Producing NEWater involves energy-intensive processes, hence the cost of building and operating NEWater plants is high compared to traditional water treatment. [1]
- Maintaining the quality and safety of NEWater requires advanced technology and skilled manpower, which adds to the long-term operational costs. [1]

1 Advantage & 1 Disadvantage @ 1 mark each, Max 2 marks

Many students wrote 'More potable water will be available' as an advantage of adopting Newater. However, such answers are not accepted as they do not show understanding of how NEWater specifically contributes to Singapore's water supply.

- (iii) Besides the strategy identified in Fig. 1.6, describe 2 other ways to manage water sustainably. [2]

- Improve water quality – Use of laws and regulations to deter people from polluting the water.
- Reducing water consumption - raise awareness and promote water conservation through education and campaigns
- Importing water from other countries such as Singapore importing water from Malaysia.

Any 2 plausible ways @ 1 mark each

Answers like Collecting rainwater, Just encourage people to save water (without giving specific examples of how that can be done) are not accepted. For answers, such as turning off the tap while showering or reusing water from washing rice and vegetables to water plants, these are considered minor examples rather than overarching strategies. They fall under broader strategies like raising awareness, and therefore, even if multiple of such examples are given, only 1 mark will be awarded.

Section B: Tropical Forests – 20 Marks

- 2 (a) Study Fig. 2.1 which shows global distribution of mangroves.



Fig. 2.1

Using Fig. 2.1, describe the areas where mangroves can be found.

[2]

- Found along coastal areas (**Compulsory point**)
- They are located in areas experiencing tropical climate/ along the equator
- High concentration in Southeast Asia, in countries like Malaysia, Indonesia, Philippines

Found along:

- Western and Southeastern coast of Africa
- Northern and eastern coast of Australia
- Northern and northeastern coast of South America
- Central America – Mexico and Caribbean islands
- Middle East – Red Sea and Persian Gulf

Markers' Comment:

- Compulsory to include 'Near or along coastal areas/ near the sea' as it's distinctive to mangroves and shown in Fig. 2.1.
- **Accept:**
 - Located along 'Tropic of Cancer & Capricorn' (**Not encouraged** to write this description as it is not shown on Fig. 2.1. So, in the future describe what you can observe from the map only)
- **Did not accept:**
 - High salinity conditions (Not shown on the map)
 - Water bodies (Too vague) because 'water bodies' can refer to lakes/ rivers etc.
 - "On the edges of the continents"/ "outer layers of countries" (Vague)

*Students should be more specific in their descriptions. E.g. Instead of 'Located on South America', students should specify which part of South America the mangroves are located at.

Any 2 points @ 1 mark each

(b) Study Fig. 2.2 which shows the roots of a mangrove plant.



Fig. 2.2

- (i) Identify the type of roots shown in Fig. 2.2. [1]
- Knee roots/ Knee bend roots

1 mark for identification of type of roots

Markers' Comments:

- Most students got this correct.

Did not accept:

- Students wrote another type of root before writing knee roots (E.g. **No marks given** if students wrote: 'Prop roots and Knee roots'. **Accept only the first answer given.**

- (ii) Explain how the roots shown in Fig. 2.2 help the mangroves adapt to its living environment. [2]
- Grow partially above the soil surface to take in oxygen directly from the air when they are exposed during low tide
 - Help to anchor the mangrove plants to the soft soil, prevents them from being uprooted and washed away by strong waves
 - Salt excluding roots - prevent salt from entering.

Any 2 points @ 1 mark for explanation on features of the roots.

Markers' Comments:

Accept:

- The roots help the trees/ plants to breathe (similar point to 'take in oxygen').
- Roots help to reduce soil erosion
- Roots help to trap sediments/ accumulate sediments for nutrients for the mangrove trees/ plants.

Did not accept:

- Salt-secreting roots (Knee bend roots are SALT EXCLUDING not salt secreting)

*If students identified b(i) wrongly, they **will not be double penalised** for b(ii). Marks will still be given for reasonable answers in b(ii).

- (c) Describe two ways in which tropical rainforests are valuable to humans. [4]
- Place for Habitation** [1]

- Indigenous (Need to state the specific group of people who live in the forests) people depend on the physical environment in the tropical forests to meet their basic needs (such as food, water, shelter and clothing). [1]

Place for Recreation (Need to provide at least 1 example of a recreational activity) [1]

- Tropical forests serve as recreational sites for people who live in towns and cities to get close to nature. [1]
- People can carry out recreational activities such as trekking, camping and birdwatching in the tropical forests. [1]

Source of Food [1]

- Plants in the tropical forests can provide food. Indigenous people would harvest many different types of edible plants (e.g. cashew nuts, mangoes and cocoa pods) for food. [1]
- Indigenous people also often hunt wild animals such as fish, deer and wild birds for food. [1]

Source of Raw materials [1] (Need to provide at least 1 example of a raw materials)

- Tropical forest provide sources of wood that can be used for building or carpentry. [1]
- Wood from mangrove trees can be used to build houses, jetties and boats. [1]
- Tropical forests also provide metals and minerals such as iron and diamonds (in the ground beneath tropical rainforests). Metals such as copper can be used to make products such as pipes. [1]

Any 2 uses with explanation @ 2 marks each

Markers' Comments:

- Common mistakes – Students wrote about environmental functions instead of uses of TF. Students have to describe how TF is valuable to **HUMANS**.
- Students did not provide an example of raw materials to explain how it benefits humans. E.g. No mark is given if students wrote 'TF provide raw materials' – what type of raw materials? Wood?

Accept:

- TF **generates oxygen for humans** to breathe in order **to survive** (Even though 'generating oxygen is an environmental function, if students are able to link how the generation of oxygen benefits humans, the answer can be accepted.

Did not accept:

- TF prevent soil erosion so that humans can have clean water. (Illogical reasoning). Unless students specifically say that the trees prevent soil erosion which may contaminate the water sources of the **indigenous people** living in the forest.

- (d) Study Fig. 2.3 which shows a graph on the area deforested by mining activities in the Brazilian Amazon rainforest from 2017 to 2021.

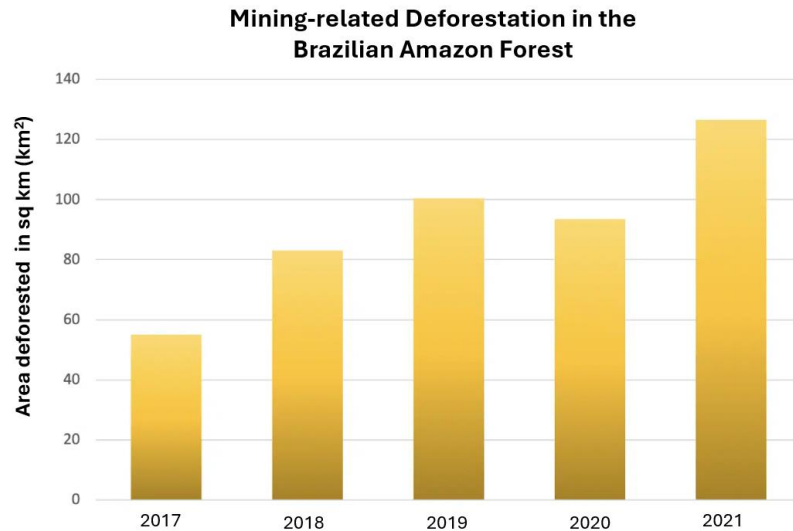


Fig. 2.3

- (i) With reference to Fig. 2.3, describe the changes in the area deforested from 2017 to 2021. [3]
- Upward trend in the area deforested from 2017 to 2021
 - From about 56 sq km (accept 50 – 59km²) in 2017 to almost 130 sq km (accept 125 – 130km²) in 2021
 - With a small decrease from 100 sq km to about 90 sq km (accept 92 - 98km²) in 2020.
 - Followed by a sharp increase from 90 sq km to almost 130 sq km (accept 125 – 130km²) in 2021.

3 points @ 1 mark each

Markers' Comments:

- Common mistakes: Students described the 'trends' instead of the 'changes'. Hence, **did not accept** answers like 'The highest area deforested is 2021...' (Because describing something is 'highest'/'lowest' doesn't show a change.)
- No mark given if data given is vague. Students should give **more specific estimate (e.g. around 55km²)** rather than 'below 100km²' or 'above 80km²'- which is too vague)
- Max 2m if descriptions are given with data but no units.
- Max 2m if no data given.
- No mark if students described changes from 2017 – 2018 & 2018 – 2019 (Because these are insignificant changes) – Should not describe year-on-year.

(ii) Besides mining, describe two other causes of deforestation. [4]

- Commercial logging: Trees are cut down to supply wood for furniture, paper, and building materials. This often involves removing valuable hardwoods from tropical rainforests.
- Roads built to reach logging sites can also open up forests to further clearing by settlers and developers.
- Clearing land for crops: Forests are cut down to make space for plantations, such as soybeans, palm oil, and corn.
- Cattle ranching: Large areas of forest are cleared for grazing land to raise cattle, especially in countries like Brazil.
- Slash-and-burn farming: Some farmers burn sections of the forest to create temporary fertile land, but this damages the ecosystem and often leads to further deforestation.

Identification of cause: 1 mark, Explanation of cause: 1 mark
Any 2 well explained causes @ 2 mark each, Max 4 marks

Markers' Comments:

Accept:

- Wildfire/ Forest fire [1] – caused by very hot and dry weather → hence sparking fire in the forest → leading to deforestation. [1]
- Clear trees to make space/ for urbanisation [1] - to build buildings/ roads/ train tracks [1]

(e) Study Fig. 2.4 which shows how tropical forests contribute to carbon storage.

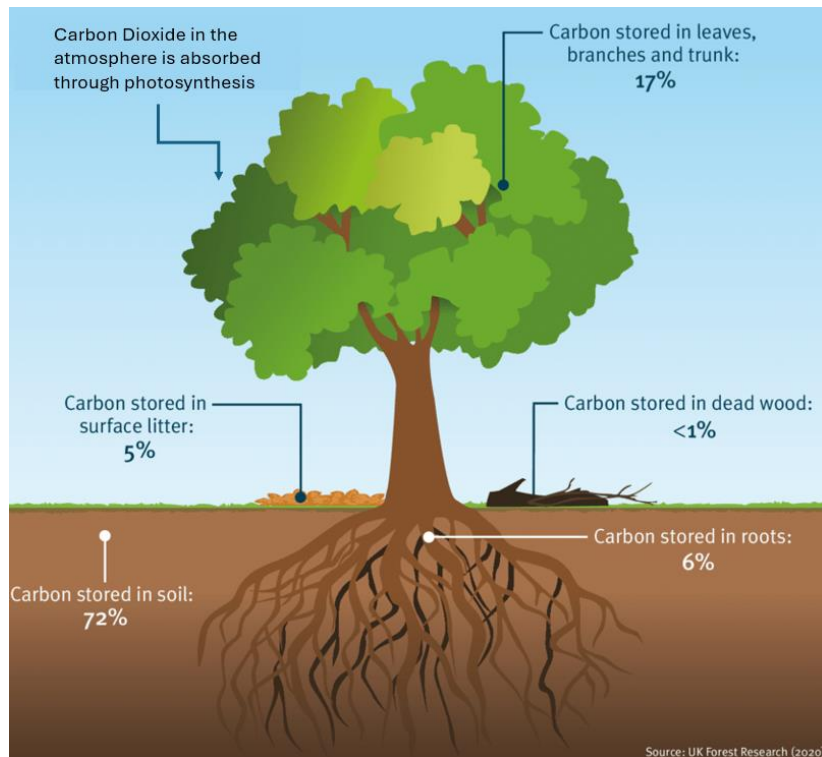


Fig. 2.4

Explain how tropical forests contribute to carbon storage and hence reduce enhanced greenhouse effect. [4]

- Tropical forests contribute to carbon storage when they absorb carbon dioxide from the atmosphere during photosynthesis.
- The absorbed carbon dioxide is then stored in solid form in the plant's leaves, branches, stems and roots.
- This helps to balance the amount of carbon dioxide added to the atmosphere through natural processes such as respiration and decomposition.
- With less carbon dioxide gases in the atmosphere, there is less greenhouse gases that traps heat, hence reducing enhanced greenhouse effect.

4 points @ 1 mark each

Markers' Comments:

- Common mistakes:
 - Many students did not explain how the absorption and storage of carbon can **help balance the amount of CO₂** in the atmosphere (i.e. Point no. 3 above).

- For the last point, students need to explain that there will be **less CO₂** in the atmosphere hence leading to **less heat trapped** and therefore **lowers global temperature**/ reducing Greenhouse Effect.

In summary, to attain the full 4m, students need to...

1. Explain how carbon is **absorbed** [1]
2. Explain how carbon is **stored** [1]
3. Explain how CO₂ can be **balanced** through carbon absorption and storage [1]
4. Explain how less CO₂ can lead to less heat trap → reduces GHE [1]

Copyright Acknowledgements:

- Fig. 1.1 Adapted from: <https://cdn.savemyexams.com/pdfs/Cb4XH3fxZi3njFXf.pdf>
- Fig. 1.2 <https://www.jumpinto.com/ielts/practice/academic/11/1/writing/1>
- Fig. 1.3 <https://www.savemyexams.com/igcse/geography/cie/20/topic-questions/3-economic-development/3-6-water/paper-1/>
- Fig. 1.4 https://www.netsolwater.com/water-pollution-caused-by-chemical-fertilizers.php?blog=817&srsId=AfmBOopkSslLutFkwi6o2stL3B7vNx5TMbUBE9DC_Pqfxv792ML_ACc5
- Fig. 1.5 <https://www.istockphoto.com/photos/factory-water-pollution>
- Fig. 1.6 <https://theconversation.com/how-singapores-water-management-has-become-a-global-model-for-how-to-tackle-climate-crisis-162117>
- Fig. 2.1 <https://scienceworld.scholastic.com/issues/2018-19/100818/mapping-mangroves.html?language=english#1120L>
- Fig. 2.2 <https://visitokinawajapan.com/travel-inspiration/discovering-okinawa-subtropical-mangroves/>
- Fig. 2.3 <https://earth.org/amazon-rainforest-deforestation-facts/>
- Fig. 2.4 https://www.researchgate.net/figure/Areas-where-carbon-is-stored-in-a-typical-temperate-forest-in-the-United-Kingdom-derived_fig1_342551992