Name	Form Class	Index Number

ANG MO KIO SECONDARY SCHOOL
END-OF-YEAR EXAMINATION 2023
SECONDARY 3 EXPRESS

GEOGRAPHY

2279
4 Oct 2023
1 hour 45 minutes

Candidates answer on the Question Paper.

Additional Material(s): Insert

ANSWER SCHEME

1. **Cluster 1: Geography in Everyday Life**

(a) Fig. 1 (Insert) shows water harvesting being carried out at a HDB block.

Using Fig. 1, suggest how water harvesting is done in the HDB block and explain its importance to environmental sustainability.

Award 1 mark for suggesting how each step works, to a maximum of 3 marks.
Award 1 mark for explaining the link between the water harvesting and environmental sustainability.
Award additional mark for further development on the environmental sustainability

Possible responses include:
1. Stormwater is collected in an underground harvesting tank via runoff from the drain.
2. Collected water will be pumped to the treatment room and public drain.
3. Collected stormwater is discharged at a slower rate into the public rain, to reduce flood risk.
4. Water will be treated before it is recycled for non-potable uses such as the washing of common areas and watering of plants decks of housing blocks. (max. 3 marks)

Outcomes and links to environmental sustainability:
Overall, water consumption consumption is reduced.
This will lead to more resources for future generation (max. 2 marks) [4]

(b) Describe the ecosystem services that can be provided in an urban neighbourhood.

Award 1 mark for each description of an ecosystem service to a maximum of 4 marks
Award a maximum of 1 additional mark for further development of each description, where applicable.

Possible responses include:

- Supporting services with variety of plants that are habitats for insect pollinators like bees.
- Regulating service by slowing down storm water run off.
- Trees around a lake in the park will help to maintain good air quality.
- Cultural service: Grassy banks or areas of open spaces can allow for the local community to carry out recreational activities like running.
- Recreational experience enhanced by aesthetics of the lake, or river around the area like in Bishan Park. [4]

(c) Fig. 2 (Insert) shows the statistics of drink driving in Singapore.

(i) Describe the changes in the number of accidents from 2018 to 2022.

Award 1 mark for each description of the changes with evidence.

Possible responses include:

- There is an overall decrease from 2018 to 2022 from 178 to 175 accidents.
- Initially, there is a steady decrease from 178 accidents in 2018 to 146 accidents in 2020.
- However, the number started to increase again after 2020 to 175 accidents in 2022, almost similar to 2018.

[3]

(ii) With reference to Fig. 2 (Insert) and studies you have made, describe the damaging impacts of traffic and air pollution hazards.

Award 1 mark for each description of the impacts with evidence from Fig. 2.
Award 1 mark for each description of the impacts of air pollution hazard, to a maximum of 2/3 marks.

Possible responses include:

Traffic hazards:

- People may suffer serious injuries when involved in a traffic accident, which may lead to fatal accidents like in Fig. 4. There were 13 fatalities in 20220 even though it is the lowest number of accidents.
- Elderly pedestrians and motorcyclists are the ones with the highest percentage of traffic accidents resulting in injuries or death.
- **Air pollution hazards:**
- Respiratory infections, heart diseases and lung cancer.
- PM 2.5, also know as particulate matter such as soot, smoke, dust and liquid droplets measuring less than 2.5 micrometers in diameter, may be produced in the urban neighbourhoods.
- High levels of exposure to nitrogen dioxide may lead to higher risks of asthma in children.

[4]

(d) With example(s), explain how community resilience is developed in an urban neighbourhood.

Award 1 mark for each explanation of how community resilience is developed.
Award an additional mark for example given, with explanation.

Possible responses include:

- Strengthening relationship among residents and raising their awareness of potential hazards.
- PA organizes a wide range of community activities aimed at fostering positive relationships amongst residents living in the neighbourhood.
- Throughout the COVID-19 pandemic, residents come together to provide assistance to others in need (eg. mask and food distribution)
- Developing resident's ability to organize themselves and equip themselves with resources to resist, adapt and recover from a disaster.
- CFRs volunteers are important in supporting the government in search and rescue operations, relief work as well as educating public on simple first aid and basic firefighting.

[5]

(e) Fig. 3 (Insert) shows a poster put up by NEA on recycling.
With reference to Fig. 3, explain how this is part of environmental stewardship that is developed in an urban neighbourhood. [5]

Award 1 mark for each explanation of how environmental stewardship is developed based on Fig. 3 together with evidence, to maximum of 2 marks.
Award an additional mark for further development based on other details/points connected to environmental stewardship, to a maximum of 3 marks.

Possible responses include:

- The figure shows the blubin and the way people are not using the recycling bin correctly.
- With 40% of items not able to recycled due to contamination, this is a concern as Singaporeans are not recycling correctly.
- NEA is educating/ raising awareness among Singaporeans on how and what they should recycle.
- This is part of environmental stewardship as it involves the partnership of public and private sectors.
- Different stakeholders come together to steward the environment.
- Residents play a vital role in the proper recycling of their waste,
- Private stakeholders provide recycling facilities. Overall, enhancing and sustaining environmental stewardship.

2. Cluster 4: Tectonics

(a) Describe how the earthquakes were measured based on the Moment Magnitude Scale. [3]

Award 1 mark for each description of the measurement, to a maximum of 3 marks.

Possible responses include:

- Earthquakes are measured using seismometers: these are sensitive instruments that detect ground vibrations and determine the magnitude of an earthquake.
- The Mw scale rates earthquake magnitude based on the total energy released during the earthquake.
- It is logarithmic-an earthquake of magnitude 6 releases about 32 times more energy than a magnitude 5 earthquake.

(ii) Explain how disaster risks caused by such earthquakes be influenced by the nature of the hazard. [5]

Award 1 mark for each explanation of how duration of shaking and time of shaking influence disaster risks caused by earthquakes.
Award an additional mark for further development of each main point.

Possible responses include:
Duration of shaking

- Length of time of ground shaking can influence the extent of disaster risks.
- The longer the duration of ground shaking, the more damaging on earthquake it will be.
- Structures such as buildings and bridges subjected to a long period of stress are more likely to collapse.
- People will more likely be trapped in collapsed infrastructure, leading to more injuries and loss of lives.

Time of shaking

- The time of day influences the activities carried out by people and how they respond when the earthquake strikes.
- If people are asleep at night, they will be less alert and are unable to evacuate quickly.
- OR
- People at work or school during the day, they are more alert and able to evacuate quickly
- Hence, they will less likely be trapped leading to less injuries and loss of lives.

(iii) Fig. 4A & 4B (Insert) show some information on the volcano.
Using Fig. 4A and 4B, explain how Taal volcano may be formed. [4]

Award 1 mark for explanation based on different stages of volcano formation, to a maximum of 4 marks.
Reserve 2 marks for use of Fig 4A and 4B.

Possible responses include:

- Eurasian plate and Philippine plate move towards each other in the convergent plate boundary.
- The denser plate subducts under the other, sinks into mantle, high pressure forces water out into the oceanic crust. Water lowers melting point in the overlying mantle, causing it to melt, forming magma.
- Magma contains dissolved gases and is less dense than the surrounding materials.
- Magma rises through weak areas in the crust to the Earth's surface to erupt as lava, causing a "violent volcanic eruption."
- The "basaltic lava" cools, solidifies and forming a steep sided volcano due to its high viscosity. Accumulates over time, forming a stratovolcano.

(iv) Study Photograph A (Insert), which shows the effects of volcanic eruption of Taal Volcano on the nearby town.

With reference to Photograph A, explain how the volcanic eruption in Taal can be hazardous. [4]

Award 1 mark for explanation of effects of volcanic eruptions in Photo A, to a maximum of 2 marks.
Award 1 mark for each Explanation to the other effects of eruptions.

Possible responses include:

- From Photo A, possible landslide or lahar(mudflows comprising water and volcanic ash) or pyroclastic flow (hot cloud of gas, ash and rocks travelling down the slopes at great speeds)
- that have bury the houses;
- destroyed properties on the main foreground.
- Trees around the area are destroyed,
- Biodiversity loss
- Loss of lives from residents living in the houses
- Extreme temperatures can burn people
- Accept other plausible answers.

(b) 'Disaster management strategies for earthquakes and/or volcanic eruptions have been largely effective.'

To what extent do you agree with this statement? Explain your answer. [9]

Relevant content
Search and rescue effort
Timely evacuation
Provision of basic social and psychosocial services to affected communities.

Lack of domestic resources, including technological and financial resources
Challenges in engaging relevant stakeholders to collaborate and integrate disaster management strategies into their practices.

A possible approach

Search and rescue efforts are important as it's immediate life-saving response. It involves finding and saving survivors trapped in buildings or disaster zones. It also aims to rescue the largest number of people in the shortest time with minimal risk to rescuers. For example, in the 2020 Aegean Sea, Turkey earthquake (Mw 7.0), more than 8 000 search, rescue and first aid teams were deployed and over 106 people were rescued.

However, it's not as effective as there are challenges. During the 2010 Mw 7.0 earthquake in Haiti's lack of resources hampered the disaster management efforts. There were critical shortage of ambulances to transport the injured, and heavy machinery to remove the rubble from collapsed buildings.
As a result, the rescue team spent many hours removing tons of rubble manually with hammers or rods to pull the trapped people under collapsed buildings.