

CONVENT OF THE HOLY INFANT JESUS SECONDARY Secondary 3 Express End-of-Year Examination 2023

| CANDIDATE NAME | | | |
|-------------------|----|--------------------|--|
| CLASS | 3/ | REGISTER NUMBER | |

GEOGRAPHY

Paper 1

2279/01

29 September 2023

1 hour 45 minutes

MARK SCHEME

1 Geographical Methods

(a) A group of students wanted to investigate the shop and service provision at ION Orchard in Singapore. ION Orchard is a premium shopping mall that brings together brands across fashion, food and lifestyle at Singapore's most popular shopping district, Orchard Road. Fig. 1 shows the questionnaire survey designed by the students.

| | Geographical Fieldwork Questionnaire |
|----|--|
| 1. | Which continent are you from? Asia Europe North America South America Australia & Oceania Africa |
| 2. | How often do you visit ION Orchard? Every day Every two or three days Once a week Once a month Rarely |
| 3. | On a scale of 1 – 3, how would you rate the shop and service provision at ION Orchard? (1 – very bad, 3 – excellent) 1 2 3 0 0 0 |
| 4. | What is/are the reason(s) for visiting ION Orchard today? Fashion and fast food Electronics Restaurants Café Beauty and wellness services Singapore Airlines service centre Others: |
| 5. | How would you describe your experience at ION Orchard? |

Fig. 1

(i) Suggest considerations the students should take to ensure that the data collected is reliable. [3]

| Award 1m per point | • | The students should consider simple random sampling as no biasness of the students is involved in the selection of |
|---|---|---|
| Cap @1m if student list the considerations | | respondents. |
| Accept plausible answers | • | The student should ensure there is a large sample size of more than 30 respondents for the questionnaire survey to ensure greater representativeness . |
| | • | The students should divide themselves and spread across several locations in ION Orchard for the questionnaire survey to achieve wider coverage . |
| | • | The students should repeat the investigation throughout the week and include both weekdays and weekends to ensure representativeness of the data collected. |

(ii) Describe the limitations of the questionnaire shown in Fig.1 in addressing the aim of the investigation.

| Award a max of 1 additional mark for further development of each point | • | Question 1 'which continent are you from' is irrelevant to the aim of the investigation and hence not necessary in the questionnaire. [1] |
|---|---|---|
| Accept plausible answers | • | The pre-defined options provided for Question 3 is too limited (only 3) . [1] This may not present a representative view of the shop and service provision at ION orchard. [1] |
| | • | There is a double-barrelled option (fashion and fast food) which belongs to two different categories in Question 4. [1] As such, the data will be inaccurate if the respondent only visits ION orchard for either one of the categories instead of both. [1] |

(b) Study Table 1, which shows the results of Question 3 in the questionnaire.

Number of responses for Question 3

Table 1

| Rating | No. of responses | | |
|--------|------------------|--|--|
| 1 | 7 | | |
| 2 | 24 | | |
| 3 | 119 | | |

(i) Using information from Table 1, draw a pie chart to show the rating of shop and service provision at ION Orchard. [3]



(ii) The teacher advised the students to use a word cloud to represent the results for Question 5 in Fig. 1.

State an advantage of using a word cloud to represent the results for Question 5 in Fig. 1. [1]

| Award 1m for valid | • | Word | cloud | simplifies | text-based | data | and | allows | the |
|--------------------|---|--------|---------|---------------|-------------|-------|-------|----------|------|
| advantage | | impor | tant po | oint to be re | cognised th | rough | bigge | r and bo | lder |
| | | word(s | s). | | | | | | |

(c) The students decide to extend their fieldwork by investigating the average daily temperature of Orchard Road and the number of visitors at two shopping malls, ION Orchard and 313@Somerset along Orchard Road.

They wanted to test the hypothesis 'There are more visitors at both shopping malls when the average daily temperature increases.'

They collected primary data for average daily temperature and visitors at both shopping malls for a week and presented the results in Fig. 2 (Insert).



(i) Describe the fieldwork method the students would use to collect and record the data for the number of visitors in Fig. 2. [4]

| Award 1m per point | Collection |
|--------------------|---|
| Deserve 1m for | • The students will position themselves at an entrance or exit |
| Reserve Inflor | of the shopping mail. |
| collection of data | • The students will determine the duration and the interval of the pedestrian count e.g. every 10 mins per hour from 12pm |
| Reserve 1m for | to 5pm every day. |
| recording of data | The students will repeat the data collection every day throughout the week |
| Accept plausible | |
| answers | • The students will carry out the pedestrian count at both shopping malls at the same time. |
| | Recording |
| | • The students will design a recording sheet with a suitable title 'recording sheet for pedestrian count' with the necessary details such as start time, end time and date. |
| | The students will use the tally method where each stroke represents 1 visitor entering/exiting the shopping mall OR |
| | The students will use a tally counter to count the number of visitors entering/exiting the shopping mall and record the data on the recording sheet. |
| | |

(ii) Using Fig. 2, evaluate how well the data supports the students' hypothesis.

| Award 1m for each | Support: |
|-----------------------|---|
| evaluation on how | • The number of visitors for both ION Orchard and |
| well the data | 313@Somerset were the highest when the average daily |
| supports the | temperature was the highest. [1] On Tuesday, when the |
| hypothesis, to a | average daily temperature was highest at 33.5 °C, the number |
| maximum of 2 | of visitors were highest at 125 and 110 at ION Orchard and |
| marks. | 313@Somerset respectively. [1] |
| Can @/m if student | From Monday to luesday, the number of visitors for both IUN Orebord and 212@Semarast increased when the every |
| did not address | daily temperature increased [1] As the average daily |
| either side (support/ | temperature increased from 30 3 °C to 33 5 °C the number |
| don't support) | of visitors increased by 40 at ION Orchard and 35 at |
| 11 / | 313@Somerset. [1] |
| Cap @3m if no data | |
| evidence is used | Don't support: |
| from Fig. 2 | • From Friday to Saturday , the number of visitors for both ION |
| | Orchard and 313@Somerset increased when the average |
| Do not accept if | daily temperature decreased. [1] As the average daily |
| Student addresses | temperature decreased from 32.5 °C to 29.5 °C, the number |
| visitors when | of visitors increased by 21 at ION Orchard and 5 at |
| temperature | 313@Somerset. [1] |
| decreases' | • From weanesday to Inursday, the number of visitors for both |
| | same when the average daily temperature increased [1] As |
| Accept plausible | the average daily temperature increased from 29.8°C to |
| answers | 31.8°C. the number of visitors increased by 21 at ION |
| | Orchard and 5 at 313@Somerset. [1] |
| | |

[Total: 20 marks]

[6]

[END OF PART 1]

2 Thinking Geographically and Sustainable Development

(a) Study Fig. 3 (Insert), which is an excerpt from an article about a fire that broke out in a shophouse at Geylang, July 2023.



Electrician Muthurama was preparing to leave for work on Monday morning when someone banged on his door in a Geylang shophouse, shouting: "Fire, fire, fire!"

"It was chaotic, everyone was rushing out. I saw the fire raging in the unit next to mine, but I didn't know if anyone was inside. After a while, I saw the fire spread to my home. My passport, valuables and

other documents are still inside. I just want to go upstairs and see what is left and if I can salvage anything," said the 45-year-old.

Another foreign worker in another unit said that he saw sparks coming out of the burning unit and was scared that the fire would spread to his room. "This is the first time a fire has happened here. The rooftop (of the unit on fire) started to collapse and I heard an explosion as the glass window shattered."

About 30 occupants from neighbouring shophouses were evacuated. The cause of the fire is under investigation.

Fig. 3

Using Fig. 3, suggest how people may be impacted by the outbreak of fires in residential areas. [4]

| Award up to 2m per well-developed explanation. Cap at 3m if students do not make reference to the Fig in their entire answer. Cap at 1m for just listing impacts. | Residents may experience respiratory problems due to smoke inhalation, as seen in the photograph in Fig. 3. [1] This can cause breathing difficulties and suffocation, which can even lead to death. [1] The outbreak of fire can lead to people's properties being destroyed, where it was mentioned that the roof of the unit on fire collapsed. [1] This would cause people to be displaced from their homes and require them to reside in temporary shelter with poorer living conditions. [1] The outbreak of fires can lead to injuries when people are rushing to evacuate. [1] Fig. 3 mentioned how "it was chaotic and everyone was rushing out". In their moment of panic, residents may trip and fall and a stamped might exerust. |
|---|---|
| | resulting in injuries or even death. [1] |
| | Accept other plausible answers. |

(b) Study Fig, 4 (Insert) below which shows the number of accidents resulting in injuries and the number of injured persons in Singapore between 2018 to 2022.



| E | i | ~ | Λ |
|---|---|---|---|
| г | I | u | 4 |

Using Fig, 4, describe the relationship between the number of accidents resulting in injuries and the number of injured persons in Singapore between 2018 and 2022. [3]

| Cap at 2m for answers with no data evidence. Reserve 1m for explicitly identifying the relationship. | There is a direct/positive relationship between the number of accidents resulting in injuries and the number of injured persons in Singapore between 2018 and 2022 [1] OR as the number of accidents resulting in injuries increase, the number of injured persons also increase, vice versa. [1] As the number of accidents resulting in injuries increased steadily from 5,476 to 6,760 from 2020 to 2022, the number of injured persons also increased steadily from 6,669 to 8,252 in the same years. [1] As the number of accidents resulting in injuries decreased significantly from 7,705 to 5,476 from 2019 to 2020, the number of injured persons also decreased significantly from 9,833 to access the significantly from 5,476 to 5,476 from 2019 to 2020. |
|--|---|
| Reserve 1m | As the number of accidents resulting in injuries increased |
| for explicitly | steadily from 5,476 to 6,760 from 2020 to 2022, the number of |
| identifying | injured persons also increased steadily from 6.669 to 8.252 in |
| the | the same years. [1] |
| relationship | As the number of accidents resulting in injuries decreased |
| relationship. | significantly from 7 705 to 5 476 from 2019 to 2020, the number |
| | of injured persons also decreased significantly from 9.833 to |
| | 6 660 in the same years [1] |
| | |
| | • However, there is an anomaly as between 2018 to 2019, the |
| | number of accidents resulting in injuries increased slightly |
| | from 7,690 to 7,705 while the number of injured persons |
| | decreased slightly from 10,018 to 9,833. [1] |
| | |



(c) Study Fig.5 (Insert), which show a map depicting a section of Iceland's capital city, Reykjavik.



With the aid of Fig. 5, describe the spatial patterns shown and account for one set of spatial associations observed in the city. [4]

| Cap at 2m if | Describe spatial patterns: |
|--|---|
| students only address one part of the question. | The major roads in Reykjavik are organised in circles/squares, where there are two distinct circles/squares found in the middle of Fig. 5. [1] Within the circle found at the city centre, the smaller roads are organised in a linear manner, especially within the northern part of the city centre. [1] There is a higher density/clustering of road networks within the city centre. [1] Most of the facilities and points of interest are clustered around the city centre. [1] |
| | <u>Account for spatial associations:</u> Museum/ art gallery and parking facilities are located in close proximity [1] to ensure greater accessibility for visitors who drive. [1] |

| • Tourist information kiosk and points of interest/ souvenir shops/ hotels are located in close proximity [1] to ensure that international tourists have easy access to assistance . [1] |
|--|
| Accept other plausible answers. |

(d) Describe the characteristics of cultural and supporting ecosystem services and the benefits they bring. [4]

| Award up to 2m for each type of ecosystem service. Cap at 2m if no benefits are stated. | Refers to the intangible benefits people obtain from ecosystems including aesthetic experiences, educational opportunities and recreational activities. [1] The presence of green spaces can provide many cultural ecosystem services such as aesthetic appreciation and opportunities for stress relieving activities. [1] When residents engage in these activities, it may improve their physical and mental health and foster their social belonging and group identity. [1] One's sense of place may be strengthened. [1] |
|---|---|
| | Supporting ecosystem services Refers to the services that are necessary for the functioning of all other ecosystems including soil formation, pollination and photosynthesis. [1] Soil formation is essential to the health of all terrestrial ecosystems as it provides a habitat for billions of organisms, contributes to biodiversity and acts as a water filter. [1] Supporting ecosystem services ensure that provisioning ecosystem services such as agriculture can take place. [1] |

[Total: 15 marks]

[END OF PART 2]

3 Tectonics

(a) Study Fig. 6, which shows the cross section of the Earth's crust and mantle.



Fig. 6

(i) Use Fig. 6 to outline one evidence of the plate tectonic theory.

[3]

| Award 1m per point | The plate tectonic theory is supported by the process of seafloor spreading and the evidence of magnetic striping. |
|---|--|
| Cap at 2m for answers that do not make specific | - The increasing age of the rocks from the mid-oceanic ridge from 0 to 5 million years old supports the plate tectonic theory that new oceanic crust is continually formed by the rising magma at the oceanic-oceanic divergent plate boundary. |
| reference to Fig/ link to plate tectonic theory | The strips of normal polarity rocks alternating alongside strips of reversed polarity rocks observed on either side of the mid-Atlantic Ridge suggest that the oceanic plates are moving away from each other/ the divergence of the oceanic plates. OR |
| Cap at 2m for answers that provide 2 sets of | - As the zebra-like pattern is symmetrical on both sides of the mid- Atlantic ridge, it suggests that the oceanic plates are diverging at the same rate at the oceanic-oceanic divergent plate boundary. |
| brief explanation | Accept other plausible answers |

(ii) Study Fig. 7 (Insert), which shows information about two earthquakes that struck southern Turkey on 2 June, 2023. The earthquakes have resulted in a cumulative total of 59,259 deaths and US\$118billion in economic cost in both Turkey and Syria.

Fig. 7 for Question 3

Turkey-Syria earthquakes on 2 June, 2023



With reference to Fig. 7, account for the impacts experienced by Turkey and Syria. [3]

| Award 2m per detailed explanation | The high death toll of 59,259 in Turkey and Syria may be attribute to the time of occurrence of the first earthquake which happened the wee hours of 4.17am when most residents are still asleep. [As most individuals are less alert and are unable to evacual |
|---|---|
| Cap at 2m for answer without | efficiently , they are more likely to be trapped under the rubble of collapsed houses. [1] |
| specific reference to Fig. | - The high death toll and high economic cost in both Turkey and Syria may be due to the shallow depth of focus of both high magnitude earthquakes . [1] With shallow depths of 24km and 10km respectively, large amounts of seismic energy are still intact upon reaching the earth's surface , causing large scale infrastructural damage and high death toll. [1] |
| | - The high death toll and high economic cost in both Turkey and Syria may also be due the high population density within 50km from the epicenter of both earthquakes. [1] With a high population density of 209,532 and 149,998 respectively, more infrastructures and individuals will be exposed to the hazards associated with the earthquakes. [1] |
| | Accept other plausible answers |

(b) 'Conducting regular evacuation drills are more effective that land use planning in building community resilience to earthquakes.'

| How far do you agree with the statement? Explain your answer. | [9] |
|---|-----|
|---|-----|

| Level 1 (1 – 3 marks) | Answers are limited to describing the process of conducting regular evacuation drills and/or land use planning without specific reference to building of community resilience to earthquakes. (L1/1 - 2) |
|------------------------------------|--|
| | <u>Brief explanation</u> of how conducting regular evacuation drills OR land use planning can build community resilience to earthquakes, <u>lacking</u> <u>named examples</u>. (L1/3) |
| | Cap at L1/3 if no supporting examples are provided in the entire answer. |
| Level 2 (4 – 6 marks) | <u>Well-developed one-sided explanation with detailed example</u> of how conducting regular evacuation drills OR land use planning can build community resilience to earthquakes. (L2/4) ; |
| | <u>Incomplete (patchy) explanation</u> of how conducting regular evacuation drills AND land use planning can build community resilience to earthquakes, but with <u>noticeable missing gaps by way of</u> <u>detailed supporting examples</u>. (L2/4) |
| | <u>Well-developed explanation</u> of how conducting regular evacuation drills AND land use planning can build community resilience to earthquakes, but with <u>noticeable missing gaps by way of supporting examples</u>. (L2/5) |
| | <u>Well-developed explanation</u> of how conducting regular evacuation drills AND land use planning can build community resilience to earthquakes, with <u>detailed supporting examples</u> for discussion of both perspectives (L2/6) |
| | Cap at L2/4 if students did not make links to how the responses are effective in building community resilience. |
| | Cap at L2/6 if students only have example for 1 side. |
| Level 3 (7 – 9 marks) | • <u>Both perspectives are considered</u> and supported with sound knowledge. An attempt is made to <u>weigh the two perspectives based</u> on a criteria. (L3/7) |
| | <u>Both perspectives are considered</u> and supported with sound knowledge. A good attempt is made to weigh the two perspectives based on a criteria. (L3/8) |

| <u>Both perspectives are well balanced</u> and accompanied by <u>good</u> <u>connection to examples</u> as evidence to support the balanced answer. There is evidence of <u>good use of geographical concept(s) to weigh the</u> <u>two perspectives.</u> (L3/9) |
|---|
| To hit this level, students must have examples for both sides. |

Possible sample answer:

Conducting regular evacuation drills can build community resilience to earthquakes as it enables locals to be **familiar with evacuation procedures and routes**. When conducted regularly, this creates awareness among the population and **reduces levels of panic and irrational behaviour** during an earthquake event. By ensuring **fast and efficient evacuation**, **the overall number of casualties will be greatly reduced** as efficient evacuation can reduce the likelihood of individuals being trapped in collapsed buildings.

- For instance, Japan conducts emergency drills annually on 1 September to commemorate Disaster Prevention Day. The intention is to prepare the people mentally on how to react to a high magnitude earthquake disaster.
- One example will include the effectiveness of **emergency drills within the schools of Kamaishi city in Japan**. During the 2011 Tohoku earthquake, nearly all of the 3000 students in the city survived. The regular evacuation drills allowed students to respond quickly and evacuate to higher grounds when the tsunami waves were approaching.

The implementation of land use planning can also build community resilience to earthquakes as it can **reduce the community's exposure** to earthquake hazards by **controlling and minimizing development in high-risk areas**. In countries near plate boundaries, it is important to implement the **use of hazard maps** to identify areas at risk, as well as **study of past earthquake events** to suggest levels of risk based on the likelihood and the likely extent of the earthquake disaster. By doing so, strict guidelines can be implemented to control development and minimize the possibility of infrastructural damage and loss of lives.

• One example is the implementation of **land use planning after the 1933 tsunami in Japan**. Recognizing that coastal areas are vulnerable, residential areas such as the **Touni-hongo village** were shifted to higher ground. This strategy helped to reduce the destruction and loss of lives when the 2011 Tohoku earthquake and tsunami struck the area.

In conclusion, I agree with the statement to a small extent. While regular evacuation drills can be effective in building community resilience to earthquakes, its effectiveness is generally limited to developed countries with financial resources, strong government political willpower, and higher levels of education to ensure public cooperation. On the other hand, land use planning can be implemented across most vulnerable countries, regardless of their level of development. By identifying at risk areas and ensuring that the population density is kept low, countries can effectively reduce the number of people and infrastructure exposed to the potential hazards, without having to exhaust extensive amounts of resource.

[Total: 15 marks]

- END OF PAPER -

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Question 2 Fig. 3 Question 2 Fig. 4 Question 2 Fig. 5 Question 3 Fig. 6

Question 3 Fig. 7

Adapted from: https://www.straitstimes.com/singapore/fire-at-shophouse-in-geylang-scdf-firefighters-onsite

https://www.channelnewsasia.com/singapore/more-traffic-accidents-involving-elderly-pedestrians-2022-fatalities-spf-police-traffic-police-3276866

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