

**Anglo-Chinese School
(Independent)**



**PRELIMINARY EXAMINATION 2024
YEAR 4 EXPRESS**

**GEOGRAPHY
PAPER 1**

2279/01

Wednesday

7 August 2024

1 hr 45 mins

Candidate Name:	Index No:
	Marks: /50

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your index number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

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

DO NOT WRITE ON ANY BARCODES.

Answer **all** questions.

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

This document consists of **17** printed pages and **1** blank page.

[Turn over

Answer all questions.

1 Cluster 1: Geography in Everyday Life

A group of students were interested in studying Pulau Batu, a small island off the east coast of Johor, Peninsular Malaysia. Pulau Batu is largely rural, with little economic development. There has been much discussion by different stakeholders about whether the island of Pulau Batu should be protected from future development.

The students surveyed 30 local residents at five sites near the main village at Pulau Batu to investigate the following hypotheses:

Hypothesis 1: 'Environmental quality increases away from the village.'

Hypothesis 2: 'Economic development in the village would bring more benefits than problems for local people.'

- (a) To investigate **Hypothesis 1:** 'Environmental quality increases away from the village', each student used a Likert scale to guide survey participants. The Likert scale used on the questionnaire survey is shown in Fig. 1.1.

Likert scale to assess environmental quality

How do you rate the following qualities of Pulau Batu?					
	Excellent	Above Average	Average	Below Average	Extremely Poor
Diversity of greenery					
Cleanliness					
Air quality					
Safety					
Number of rest areas					
Accessibility					

Fig. 1.1

The results collected from two survey respondents at Site 2 are shown in Fig. 1.2.

Results collected from two survey respondents

Person A

How do you rate the following qualities of Pulau Batu?					
	Excellent	Above Average	Average	Below Average	Extremely Poor
Diversity of greenery	✓				
Cleanliness		✓			
Air quality	✓				
Safety		✓			
Number of rest areas			✓		
Accessibility		✓			

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Person B

How do you rate the following qualities of Pulau Batu?					
	Excellent	Above Average	Average	Below Average	Extremely Poor
Diversity of greenery			✓		
Cleanliness			✓		
Air quality	✓				
Safety			✓		
Number of rest areas				✓	
Accessibility				✓	

Fig. 1.2

- (i) Explain the purpose of using a Likert scale and suggest any **two** advantages associated with its use.

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- (ii) Suggest **two** reasons why the two survey responses were different.

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- (iii) How could the group of students be sure that their survey results were reliable?

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(b) Figs. 1.3A and 1.3B show the collated survey results the students obtained.

Table of collated survey results

How do you rate the following qualities of Pulau Batu?					
	Excellent	Above Average	Average	Below Average	Extremely Poor
Diversity of greenery	12	9	5	3	1
Cleanliness	5	8	11	4	2
Air quality	13	11	4	1	1
Safety	8	10	9	2	1
Number of rest areas	3	5	9	12	1
Accessibility	3	5	8	13	1

Fig. 1.3A

Graph of collated survey results



Fig. 1.3B

On reviewing the students' collated data, their teacher pointed out that they did not have sufficient information to form a conclusion on **Hypothesis 1**: 'Environmental quality increases away from the village.'

Explain why the students did not have sufficient data to form a conclusion on their hypothesis.

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- (c) To test **Hypothesis 2**: 'Economic development in the village would bring more benefits than problems for local people', the students conducted a questionnaire survey at the fieldwork sites. The questionnaire is shown in Fig. 1.4.

Questionnaire

We are a group of students from Pulau Batu Secondary School. We are doing a survey about the possible benefits and problems of any future economic development in the village for local people. Please answer the following questions.

1. Do you live in Pulau Batu? Yes / No (please delete)

2. What do you think would be the main benefits of economic development in Pulau Batu?

3. What do you think would be the main problems of economic development in Pulau Batu?

Thank you for your time!

Fig. 1.4

- (i) Explain the sampling method the students could use to collect the data needed to test their hypothesis.

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- (ii) With reference to Fig. 1.4, describe any **one** way the questionnaire may be improved.

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 [1]

- (d) The following week, another group of students at the school wanted to investigate the microclimate around their school. They wanted to find out whether buildings and different types of ground surface influenced the air temperature.

They investigated the following hypothesis: 'Air temperature is higher nearer to buildings.'

The temperature at the sites was measured using a hand-held digital thermometer. The instructions from the teacher on how to use this thermometer are shown in Fig. 1.5.

Instructions for using the hand-held digital thermometer

Readings should be taken at each site at 8 am and 3 pm. Hold the digital thermometer at waist height for 30 seconds. Write the air temperature on the recording sheet. Repeat the measurement two minutes later. Calculate the average (mean) temperature of the two readings. Record this on the sheet too. Do this for three days.

Fig. 1.5

- (i) State **one** advantage of using a digital thermometer over the traditional mercury thermometer.

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 [1]

- (ii) Identify **two** problems with the method described in Fig. 1.5.

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- (e) Study Table 1.1, which shows the temperature measured at each site.

Table 1.1

Air temperature at each site (°C)

Site	A	B	C	D	E	F	G	H	Average temperature (8 am, 3 pm)
Distance from building (m)	32m	2m	3m	40m	1m	17m	9m	2m	
Day 1, 8 am	24.1	25.3	25.8	25.3	25.7	25.5	25.8	25.6	25.4
Day 1, 3 pm	31.0	31.8	33.0	31.6	31.5	31.8	32.0	32.9	32.0
Day 2, 8 am	23.3	23.8	23.8	23.0	23.5	22.9	23.2	23.5	23.4
Day 2, 3 pm	30.0	31.4	32.4	33.4	34.6	34.3	34.0	33.8	33.1
Day 3, 8 am	23.2	23.1	24.5	22.8	24.3	23.1	22.9	23.0	23.4
Day 3 3 pm	25.0	25.9	27.0	24.6	26.3	25.1	25.3	25.8	25.6

Describe the changes in average temperature between 8 am and 3 pm during the three days. Support your answer with data from Table 1.1.

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[Total: 20]

2 Cluster 2: Tourism

- (a) Fig. 2.1 is a photograph showing a football stadium in Buenos Aires, Argentina.

Photograph showing a football stadium in Buenos Aires, Argentina



Fig. 2.1

- (i) Using Fig. 2.1, identify **two** characteristics of this area that may reduce accessibility for visiting football supporters.

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(ii) Suggest how having many visitors in an area such as this could have:

- A one positive economic impact on local communities.
B one negative economic impact on local communities.

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[4]

[illegible]This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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Cluster 3: Climate

- (a) Study Table 3.1, which shows the rainfall patterns for equatorial and monsoon climates.

Table 3.1**Average monthly rainfall in mm**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Equatorial climate	172	153	165	158	165	148	141	138	163	172	162	165
Monsoon climate	3	16	57	107	246	432	469	378	256	102	34	14

Using Table 3.1, describe the differences in the rainfall patterns of equatorial and monsoon climates.

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- (b) Fig. 3.1 is a photograph showing solar panels on the rooftops of public housing blocks in Singapore.

Fig. 3.2 is a graph showing daylight and sunshine hours per day in Singapore.



Fig. 3.1

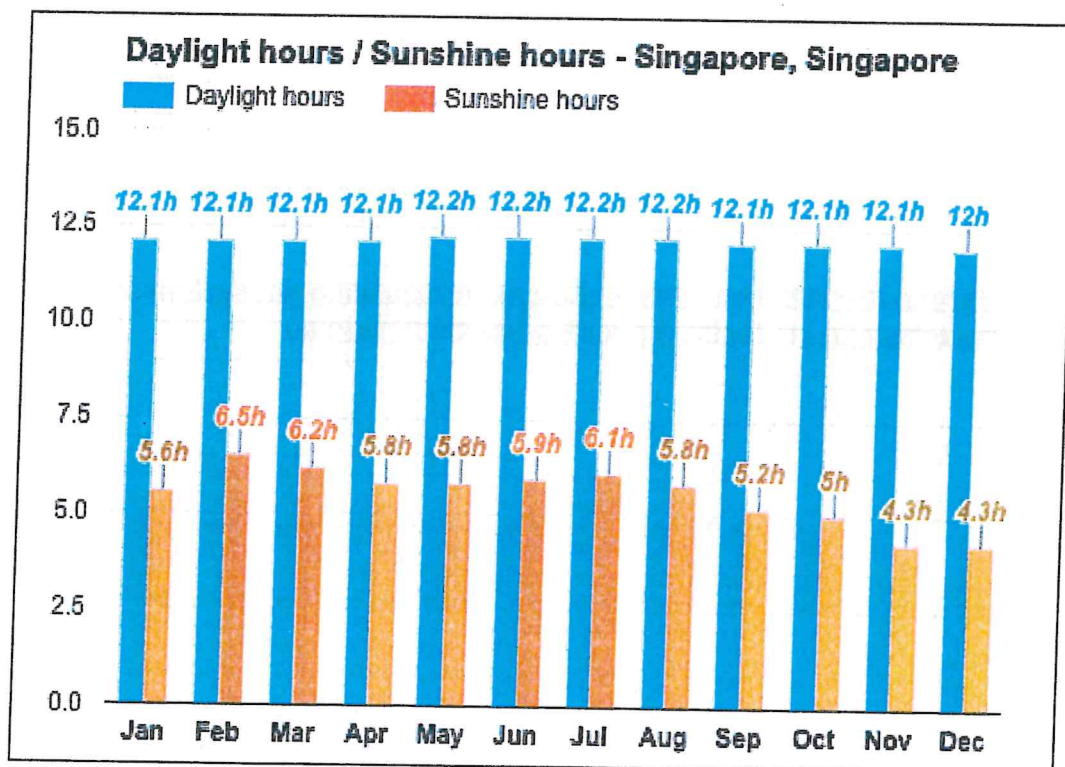


Fig. 3.2

With reference to Figs. 3.1 and 3.2, suggest **two** limitations of relying on solar energy in Singapore.

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- (c) With examples, outline **one** way in which rising temperatures can be a threat to terrestrial flora and fauna.

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- (d) Explain the effect of climate change on regulating ecosystem services and how this can indirectly impact the health of people.

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[Turn over]

- (e) Explain **two** conditions that make communities vulnerable to climate related hazards.

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[Total: 15]

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Copyright Acknowledgements:

Question 2	Fig. 2.1	https://www.alamy.com/stock-image-la-bombonera-stadium-la-boca-buenos-aires-argentina-164019381.html
Question 3	Fig. 3.1	https://www.straitstimes.com/singapore/housing/hdb-increases-solar-target-enough-to-power-135000-four-room-flats-by-2030
Question 3	Fig. 3.2	https://www.weather-atlas.com/en/singapore/

SUGGESTED ANSWER FOR Y4 GEOGRAPHY CORE PRELIM EXAM PAPER ONE 2024

- 1 (i) **Explain the purpose of using a Likert scale and suggest any two advantages associated with its use.** [3]

Explain purpose

- A Likert scale guides survey participants to respond to questions on their opinions with a wide range of responses. [1]

Suggest two advantages

- A Likert scale contains predefined responses, which make them easier for respondents to answer. [1]
- Researchers may find predetermined responses easier to analyse and interpret since the data is placed into fixed categories. [1]
- Such responses are useful for quantitative data analysis to examine patterns and trends. [1]

3 well-elaborated points on purpose and 2 advantages, at 1 mark each

- 1 (ii) **Suggest two reasons why the two survey responses were different.** [2]

- Decisions are subjective / personal opinions / different perspectives
- The respondents come from different backgrounds
- Survey may have been done at different times
- If survey respondents look at the same site standing at different places, they may see the same view differently
- Survey respondents may not be sure of the descriptors
- No pilot study may have been done for standardisation

well-elaborated points on any 2 reasons, at 1 mark each

- 1 (iii) **How could the group of students be sure that their survey results were reliable?** [2]

- They could increase their sample size, such as by surveying 100 locals instead of 30
- They could use average results and identify anomalies
- They could do the surveys at the same time or same day
- They could agree on the meaning of the descriptors and introduce them to respondents
- They could do a pilot survey to see if the questions could be easily understood and could generate useful results

2 well-elaborated points, at 1 mark each

1 Explain why the students did not have sufficient information to form a conclusion on their hypothesis.

[2]

- To form a conclusion on Hypothesis 1, the students need the data collected at each of the five different sites to be grouped separately based on their increasing proximity from the village.
- As the students' data was aggregated across the five sites instead, the data did not account for their varying distance from the village. They thus could not form a conclusion.

2 well-elaborated points, at 1 mark each

1 c (i) Explain the sampling method the students could use to collect the data needed to test their hypothesis.

[3]

Simple Random Sampling

- Use a random number table/generator to generate random number to select person to survey.
- E.g. if number 2 is picked, survey the 2nd person; if number 5 is picked, survey the 5th person. Repeat the process.
- They should ensure that the respondent is a local person. If the respondent indicates 'No' to Question 1 ('Do you live in Pulau Batu'), the students should end the survey.

OR Stratified Random Sampling

- Select sample that has a proportionate make up of the population based on age and sex or other categories
- Selection of each sub-group carried out randomly using a random number generator
- They should ensure that the respondent is a local person. If the respondent indicates 'No' to Question 1 ('Do you live in Pulau Batu'), the students should end the survey.

OR Convenience Sampling

- Ad hoc manner / most accessible manner
- E.g. give out questionnaire to the first 30 / 50 / 100 people
- They should ensure that the respondent is a local person. If the respondent indicates 'No' to Question 1 ('Do you live in Pulau Batu'), the students should end the survey.

OR Quota sampling

- predefined group to replicate general structure of population
- e.g. based on gender of population (i.e. male / female)
- They should ensure that the respondent is a local person. If the respondent indicates 'No' to Question 1 ('Do you live in Pulau Batu'), the students should end the survey.

If no name / incorrect name of method; credit accurate description [max 2]
 If correct method and describe different method, only credit method name [max 1]

- any 3 well-elaborated points at 1 mark each for a sampling method

1 c (ii) **With reference to Fig. 1.4, describe any one way the questionnaire may be improved.** [1]

- The students could simplify the term 'economic development' by phrasing it in terms of concrete actions that may be taken e.g. building of factories, increasing the number of tourism facilities.

1 mark for well elaborated 1 point

1 d (i) **State one advantage of using a digital thermometer over the traditional mercury thermometer.** [1]

- Quick or instant reading
- Accurate reading

1 mark for well elaborated any 1 point

(ii) **Identify two problems with the method described in Fig. 1.5.** [2]

- The instrument should be used at least 1.5m above the ground to avoid distortion from heat radiated from the ground.
- Waist height can vary between people.
- 3 days may not be sufficient for reliable readings.
- Student's body heat may affect reading.
- The instrument should not be used in direct sunlight.

well elaborated of any 2 points at 1 mark each

1 **Describe the changes in average temperature between 8 am and 3 pm during the three days. Support your answer with data from Table 1.1.** [3]

- Morning always cooler than afternoons.
- Locations nearer to the building generally show a larger increase in their afternoon temperatures.

Well elaborated 2 points, at 1 mark each

Max 2 marks if no reference to data from Table 1

2 a (i) Using Fig. 2.1, identify two characteristics of this area that may reduce accessibility for visiting football supporters. **[2]**

- Does not appear to have good public transport service (e.g. bus, rail) and infrastructure (e.g. train stations)
- Roads appear limited and narrow
- Limited/unavailable parking for supporters who drive

any 2 well-elaborated points at 1 mark each

2 A (ii) Suggest how having many visitors in an area such as this could have: **[4]**
A one positive economic impact on local communities.
B one negative economic impact on local communities.

A: positive economic impact

Employment opportunities in formal and informal tourism sectors

- tourism industry is labour intensive
- creates a large number and wide range of employment opportunities for people of varying skills
 - transport, e.g. drivers and service staff on buses
 - accommodation, e.g. hotel service staff
 - leisure activities, e.g. tour guides, staff in amusement parks, museums
- can reduce unemployment in the area

Income generation from tourists' spending on consumer goods and services.

- When tourists spend money buying goods and services offered by the locals, e.g. accommodation and food, they can increase incomes for the locals
- Tourist can help alleviate poverty in the area
- Standard of living can also increase

B: negative economic impact

Economic leakages resulting in less tourism revenue.

- revenue generated lost to economies of other countries
- occurs when local businesses pay for import of goods and services to support tourism, e.g. money spent on importing food from overseas/elsewhere in the country
- this reduces the revenue earned, minimizing income earned by the locals

Overdependence on tourism, which increases **vulnerability** to sudden falls in tourist numbers.

- area overdependent on tourism for its income and employment is vulnerable to sudden fall in tourist numbers
- may occur due to unexpected events such as
 - natural disasters in the area such as hurricanes, or earthquakes or volcanic eruptions; which may cause damage to infrastructure, and people fear for their safety and postpone or cancel travel
 - unfavourable political situation in the area, e.g. riots or protests, and governments may close affected area or discourage travel there

well-elaborated 2 points on positive and 2 points on negative impacts, at 1 mark each

(b) With reference to examples, evaluate the impact of ecotourism development on local communities and the environment.

[9]

Level	Marks	Generic level descriptors for 9 marks question
3	7-9	Develops arguments that support both sides of the discussion clearly, using a range of points with good elaboration. Examples used demonstrate a comprehensive understanding of the issue or phenomenon. Evaluation is derived from a well-reasoned consideration of the arguments.
2	4-6	Develops arguments that support both sides of the discussion clearly, using a range of points with good elaboration. Examples used demonstrate a comprehensive understanding of the issue or phenomenon. Evaluation is derived from a well-reasoned consideration of the arguments.
1	1-3	Arguments are unclear with limited description or may be listed. No examples provided or examples are generic, demonstrating a basic understanding of the issue or phenomenon. Evaluation is simple, missing or unclear.
0	0	No creditworthy response.

- Ecotourism is a form of **sustainable tourism** that **takes place in natural areas** which are scenic, allows tourists to experience nature.
 - It aims to **conserve natural environment** while **benefiting local community, ensuring environmental, economic and social sustainability**.
 - Ecotourism involves many stakeholders depending on projects undertaken.
 - i.e. ecotourism seeks to **protect environment**, while **maximising economic benefits** to villagers and **preserving certain traditions** at same time.
 - Ecotourism is a form of sustainable tourism that aims to reduce the impact on the natural environment and sustain the economic and social wellbeing of local people.
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- **Educate and increase tourists' appreciation of nature**
 - natural areas for tourists to **experience & interact** with **nature**.
 - increases tourists' knowledge and appreciation of nature → encourage tourists to take action to conserve & minimise damage to the environment.
 - ensures **environmental sustainability**.
 - *enables environment to continue to attract tourists → ensuring sustainable tourism development.*

 - **Put in place measures to minimise the negative impacts on the environment**

 - Tourism revenue **channeled into conservation** of natural environment, e.g. hire local park rangers, habitat restoration
 - Park rangers ensure laws set up to protect environment are adhered to minimize damage to environment → ensuring environmental sustainability.
 - *enables environment to continue to attract tourists → ensuring sustainable tourism development.*

 - e.g. [Galapagos](#) Islands in Ecuador:
 - unique flora and fauna
 - declared **UNESCO World Heritage site** in 1979.
 - To conserve unique biodiversity, 97% of islands' total area declared national park, 3% for humans to live on.
 - Authorities implemented **rules** and **regulations**
 - E.g., **limit number** of visitors in park on any given day to minimise disturbances to wildlife. Tourists pay **entrance fee** (USD\$100), revenue earned funds conservation projects. Tourists not allowed to explore islands on their own. A **guide**, who educates tourists, is required at each site.
 - Locals involved in ecotourism industry → offer day tours and homestays to small groups of tourists.

 - Ecotourism experiences within a destination can vary across a spectrum:
 - Hard and soft ecotourism in same destination. E.g., study found that **hard ecotourists** in Galapagos Islands have higher preference for challenging activities, e.g. camping & hiking, plan own tour schedule with accompanying guide. Accommodation in locals' homes.
 - **soft ecotourists** in Galapagos Islands have higher preference for less challenging activities, e.g. guided trail walks, rely on travel agencies to plan entire tour schedule, prefer to stay in high- quality accommodation, e.g. yachts and cruises.
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- **LIMITATIONS**

- **Uncertainty over the continuity of efforts in conserving nature**

- Need to operate at smaller scale.
- When sites become very popular, presence of large number of tourists interacting with nature may destroy environment they seek to protect.
- E.g. , Galapagos Islands, oil spills from large number of boats resulted in serious water pollution. Large increase in number of tourists → erosion along trails, disturb animals and plants.
- Ecotourism sites have to be carefully managed → limit to how many local ecotourism projects can take place.
- BUT, if there is strong desire to earn profits from ecotourism, some aims of ecotourism may be compromised and nature may not be conserved after all.

- **Uncertainty over involving local communities**

- challenge → **uncertainty in efforts** to conserve nature and involve local communities.
- As ecotourism sites become popular, demand for manpower to meet needs of tourists → some tourism-related businesses may hire non-locals when locals not sufficiently equipped with skills and knowledge required
- Authorities or businesses **do not put in place measures** to train locals.
- **Result → benefits** to local communities **not maximised**.
- E.g., in Kufri, India, if locals do not have necessary skills, jobs go to non-locals which leads to increased economic leakages.

- However, the aims may not always be realized, and ecotourism may do more harm than good in certain places.
 - Poor management may harm the environment by introducing people to ecologically sensitive areas; the carrying capacity may be exceeded.
 - As a destination's popularity grows, resources suffer from overuse.
 - Human activity might disrupt wildlife; encourage soil erosion and habitat loss and put pressure on limited water resources.
 - Ecotourism is promoted and advertised in the media as responsible tourism, resulting in a large increase in tourist numbers globally.
 - Many ecotourism destinations are in remote areas, requiring extensive air and vehicle travel and creating large carbon footprints.
 - International developers may divert money away from the local community; corrupt governments may take a large cut of the profits.
 - There may be threats to indigenous cultures. However, the promotion of ecotourism may educate people of the need for responsible and sustainable tourism.
 - Considerable doubt has been cast on whether the aims have been fulfilled and on the negative environmental, economic and social impacts. Ecotourism may not be entirely sustainable, especially on a global scale.
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Suggested conclusion:

- Ecotourism has undeniably contributed to conservation and raised awareness, but challenges remain. To ensure its long-term success, stricter regulations on tourist numbers, focus on locally-owned operations, and continuous monitoring of environmental impacts are crucial. Ecotourism, when well-managed, offers a powerful tool for sustainable tourism development.

3 a) Using Table 3.1, describe the differences in the rainfall patterns of equatorial and monsoon climates. **[3]**

- **Equatorial climate**: consistently high, distributed evenly throughout the year, total annual rainfall is 1902 mm
- **Monsoon climate**: distinct wet and dry season, unevenly distributed throughout the year, total annual rainfall is 2114 mm
- Rain falls mostly from April to October

3 marks for correct calculation of total annual rainfall and accurate description of 3 points on both climates, at 1 mark each

3 B With reference to Figs. 3.1 and 3.2, suggest two limitations of relying on solar energy in Singapore. **[2]**

- Lack of available space
- Limited sunshine hours
- Cloudy conditions/lack of clear skies
- Effect of seasonal monsoons in November and December
- Average sunshine hours is 5 hours for each month

2 marks for correct elaboration of 2 relevant points, at 1 mark each, with data quoted from the table in the answer, max 1 mark if no data is quoted in answer

2 (c) With examples, outline one way in which rising temperatures can be a threat to terrestrial flora and fauna.

[3]

Changes in geographic distribution of terrestrial species

- terrestrial species forced to adapt → Those that can migrate will find places with their preferred temperature.
- Generally, this involves shift to higher latitudes and altitudes where temperatures are cooler.
- E.g., about 170 species of birds tracked in North American continent have expanded their range northwards by 50km on average in past four decades.
- Boreal forests are advancing northwards into the tundra, and are themselves being replaced by temperate forests
- poleward movement general trend with some exceptions.
- Species migration influenced by atmospheric temperature and other factors, e.g. water availability, sunlight conditions.
- Some species in California, USA, migrate downslope due to greater shade and moisture downslope.

Changes in population density and composition of ecosystems

- As geographic distribution of species change → mix and population densities of prey, predators and competitors in ecosystems change → disrupts food webs, new terrestrial communities develop.
- Changes already → Some terrestrial species flourish, others decline (can't find suitable habitats to migrate to).
- Mountain species prefer cold environments, might not have anywhere to go if mountain tops too warm → face competition with species from lower altitudes moving upwards → extinctions predicted to occur at higher rates in mountainous areas
- highest risk, e.g. Australia's mountain pygmy possums, population declining (less available cold environment for them)
- Plant species decline → unable to move and adapt fast enough.
- Some species will flourish → migrate to new, suitable habitats.
- Different species respond differently, new terrestrial communities develop.

3 marks for correct elaboration of 3 relevant points on impacts of rising temperatures on both plants and animal species, at 1 mark each, with named examples of species and locations

(d) Explain the effect of climate change on regulating ecosystem services and how this can indirectly impact the health of people. [3]

- Climate change causes physical changes to the environment affecting its ability to regulate and spread diseases where people could get sick more easily
- Warmer temperatures create more conducive environments for vectors, e.g. mosquitoes and ticks to survive and breed
- As temperatures increase, mosquitoes will now be able to move to higher latitudes and altitudes which are now warmer → more areas of the world at risk of vector borne diseases, e.g. dengue fever
- E.g. Butan, Before 2018, mosquitoes non-existent (too cold for mosquitoes to breed), in 2019, country suffered first national dengue epidemic (19 out of 20 districts reported cases of the dengue virus)

3 well-elaborated points on description of climate change and impacts on human health, at 1 mark for each point

(e) Explain two conditions that make communities vulnerable to climate related hazards. [4]

Poverty

- Extreme weather, e.g. droughts and floods, can result in crop failure → reduce food supply → may result in prices of food to increase → poor unable to cope with price increases → vulnerable to food shortage
- E.g. Afghanistan, widespread poverty, prolonged and severe drought in 2018-2019 caused 10m people to face severe food crisis
- Poor may not be able to afford health resources when they are infected with diseases caused by climate change
- E.g. Highlands of Malawi, increased temperature led to incidence of malaria spreading; poverty and lack of health resources for treatment → malaria is the leading cause of death in pregnant women and children

Lack of access to piped water

- Extreme weather, e.g. cyclones and floods, may result in contamination of water sources, e.g. wells
- Rural communities rely on rivers and wells, not connected to piped water systems → lack access to clean water
- Forced to drink water from contaminated sources, leading to spread of diseases, e.g. cholera
- E.g. Dar Es Salaam (Tanzania), has limited access to piped water; floods in cities resulted in contamination of wells → high incidences of cholera, 2015-2016 there were 500 cases of cholera in city

4 marks for correct elaboration of 2 relevant points, at 1 mark each