Name: _____ **CG:** _____ **Date:** _____

SERANGOON JUNIOR COLLEGE
JC2 H1 GEOGRAPHY
2018 Preliminary Examination Answer Scheme

Section A

DRQ 1

Rubric *Criteria to hit*	**Marks**	**Reflection** *(i) How different is my answer from the rubric?* *(ii) Why is it different?*
(a) With reference to the context provided, select and describe sampling method(s) that the students could have used to identify participants for their survey • Use random sampling to identify specific blocks (number all blocks, use a number generator to select 3 blocks out of 5 blocks) • Use systematic sampling to identify specific floors in each block, followed by specific units in each floor (for instance, select alternate floors such as the 1st and 3rd floors, then select alternate units on each floor)	**[3]**	
(b) Suggest how the fear of crime can be shaped by demographic characteristics reflected in Resource 1. • **Gender** – Females may have a greater fear of crime than men due to perceived notions of physical vulnerability. Females may also have a greater fear of specific crimes (such as sexual assault). Gender likely to be significant in influencing fear of crime in the given investigation due to the higher proportion of females in the sample (17 out of 27).	**[5]**	

• **Age –** Third agers (60s to 70s) who are more physically fit and mobile may feel less vulnerable and hence less fear, compared to fourth agers (80s and above) who are physically less mobile • **Ethnicity –** Native Swedish may feel more fear as they may believe they are targeted by "minority" groups. • **Time of residence –** Residents who stay longer may feel less fear due to greater levels of familiarity with the environment and its residents • **Marital status –** Widowed individuals may experience more fear as they do not have a partner watching out for their safety. The fear is likely to be amplified by gender, as most widowed individuals are likely to be female (as females tend to outlive their male partners).		
(c) Outline the strengths and limitations of the questionnaire survey (shown in Resource 2). **Strengths** • For sensitive demographic information, categories are provided • Use of semantic scale for most question enables responses to be more focused • Questions are worded clearly, with specific emphasis on fear of crime (which is the focus of the investigation) **Limitations** • Can be specific in defining "crime in public spaces", as the perception of crime may vary across residents • Can be more specific in identifying the type of crime, and different crime elicits different levels of fear • Most of the questions appear to be close-ended questions, may limit the range of qualitative responses • Q13 is highly ambiguous as the impacts of crime on quality of life isn't clarified. In addition, the scale of 1-10 is too broad and participants may have issues	**[6]**	
(d) Explain how the group may overcome ethical concerns they face in their collection of primary data for this investigation. • Informed consent – Before the session, the participant should be informed of the research focus, demands and risks associated with the interview	**[4]**	

• Be respectful when speaking to participants – do not pass judgment or make jokes about what they share • Do not ask sensitive information – Avoid asking personal information such as income, employment, specific age. As the focus of the investigation is on fear of crime, be wary when probing on past victimisation encounters.		
(e) With reference to Resource 3 and your own knowledge, explain how the data collected can help in understanding the needs of the elderly in Hässelgarden senior housing and suggest how this investigation on fear of crime may be extended. <u>How the data can help us understand the needs of the elderly</u> • Social/emotional needs : ➢ From the mental map, it is evident that places deemed as unsafe are places with "less familiar people". Social connections to a community is hence an important factor in reducing fear. ➢ The mental map clearly shows that "fearful places" are locations that lack "natural surveillance" (ie: deserted). Some pedestrian flow is hence needed to give the elderly a sense of security. • Physical needs : ➢ Places deemed to be unsafe are places that limit mobility, in terms of visual navigation (ie: illumination) or physical navigation (ie: no clearly defined paths, too crowded). Hence the elderly requires changes to the physical environment to facilitate mobility. ➢ The mental map shows a clear distance decay effect, where places nearer to home are deemed as safer. This suggests that higher levels of liveability for the elderly can be achieved by placing amenities and services closer to their homes. <u>Extending this investigation on fear of crime</u> • Investigating different locations beyond Hasselgarden senior housing and do a comparative study	**[7]**	

• Investigate perception of fear among other demographic groups (such as higher-income aged communities) • Explore differences in perception of fear at different times of the day (night versus day)		

DRQ 2

Rubric *Criteria to hit*	**Marks**	**Reflection** *(i) How different is my answer from the rubric?* *(ii) Why is it different?*
(a) Using Resource 4, describe the spatial distribution of the 2005 Mumbai flood. - Uneven spatial distribution with the highest concentration on the western coast and south central of Mumbai while the interior is relatively intact. - In terms of land use, the worst affected are the inner and outer suburbs - Flooded areas follow the alignment of the railway system.	**[4]**	
(b) Describe and explain how land use changes between 1966 and 2005, as shown in Resource 5, have increased the vulnerability of Mumbai to floods. Land uses which have increased the vulnerability - Build up areas increased by about 16% between 1966 to 2005. Larger impermeable surfaces (bitumen, concrete) in the forms of pavements, car parks,roads, highways which prevent infiltration of rainwater. With greatly reduced infiltration capacity, there is quick generation of overland flow when it rains. Higher population in urban areas means more people are at risk of flooding. - Airport and reclaimed land are also largely impermeable surfaces and with their compacted and flat surfaces mean greater likelihood of quickflow and inundation. - Removal of vegetation : means reduced interception storages, infiltration and percolation. This encourages overland flow at the expense of the slower baseflow. Greater proportion of the water will arrive at the channel and if the bankfull discharge is exceeded, flood ensues. A flashier response	**[5]**	

-Rivers/Streams are reduced. With fewer channelized pathways to transport floodwater away, rainwater accumulates quickly on urban surfaces resulting in pluvial flooding		
(c) With reference to Resource 6, explain how these human features could have contributed to a flood event. - Riverside settlements (slum by the river banks) – constitutes obstruction to river flow. Channel flows at these banks are constricted . the impermeable surfaces (roads, paved surfaces, rooftops) of these houses encourage rapid runoff of rainwater to the channel where a rapid rise means overtopping of excess water onto the land (floodplains). - Support pillars of the water/sewage pipes) also acts as physical barriers to the unhindered channel flow. - The huge amount of garbage (plastic etc.) can also obstructs the natural flow of river . They clog they clog, reduce the channel capacity to hold water and cause water to back up during rainfall, flooding the surrounding area.	**[4]**	
(d) Explain why an integrated flood risk management, consisting of structural and non-structural measures, is necessary to reduce flood risk in locations such as that shown in Resource 6. Flood risk = Impact (severity) X Likelihood **Structural – involves physical construction – generally to reduce severity of flood** - channelization (deepen, widen, smoothened, straightened) - floodwalls - network of drains - river embankments, dyes to prevent overflow to floodplain settlement - diversion canals/spillways	**[7]**	

- detention ponds **Non-structural – generally to reduce likelihood of flood** -relocation to higher grounds - clean up river of garbage, dredging of silt to restore capacity of river - flood hazard mapping – land use planning forbidding risky assets/infrastructure from locating near river - Education on anti-littering, community preparedness on what to do during a flood - Early warning system via SMS, radio/TV broadcast of impending flood - afforestation - river restoration – bringing back the natural state of river with its larger floodplain which can hold more water **Evaluation** : **Consider the Pros and cons of these measures** A: Structural (+) effective if well planned and maintained, gives a sense of security to riverside communities , short time to implement unless massive like a dam (-) - can fail catastrophically, flood effects can be worst than if measure was not adopted e.g. artificial levees of New Orleans during Hurricane Katrina. - Channelisation means channels are now efficient in transferring flood water and causing flood downstream - Climate change with its new normal of extreme weather phenomena means greater uncertainty as to whether these structures can cope with exceptionally intense rainfall events and the deluge of water. Drains and channelized canals become underdesigned. B: Non-structural (+) cheaper, more sustainable in the long run, less harm to the natural environment (eco friendly) (-) - some take a long time to take effect and it is land intensive e.g. afforestation, - floodplain zoning laws difficult to implement in countries like India where dwellers have occupied the land for generations and where there are no alternative sites to go to in a resettlement exercise		

- false alarm of flooding warming when no flooding actually occurs, which causes unnecessary panic, or warning of the wrong intensity such as a warning of a flood alert when a severe flood warning is more appropriate will still leave people unprepared for the real severity of flooding **Conclusion** : There is no one-size-fits all solution to address the risk of floods. Hence, a holistic and integrated approach embodying both structural and ono-structural measures to fit the local conditions is necessary and would be judicious for the authorities.		
(e) Using the given resources and your own knowledge, give reasons why extreme flood events could result in high annual flood costs in coastal cities, as shown in Resource 7. - Coastal cities are the economic hubs and the main engine of economic growth in their countries Locations of CBD, transport/communication hubs. Extreme floods will cause disruption to businesses, services and manufacturing, reduce productivity of firms and their workers. - Spatial concentration of high valued assets and critical infrastructure. Residential properties, office buildings, industrial complexes, power lines, transport system, airport. If destroyed or disrupted, there are high economic costs in the forms of insurance, repair, and the indirect effect of business/factory closures, unemployment, fall in income and GDP to national economy - Frequent floods will damage the reputation of such cities as places to invest, visit and live.	**[5]**	

3 (a) Explain the types of evidence that are available for the study of climate change in the tropics since the Pleistocene. **[9]**

Indicative content

Cite Geomorphological evidence , **Hydrological** evidence, **Botanical** remains and archaeological evidence

3 (b) To what extent should adaptation efforts be focused only on rural regions and mitigation efforts only in urban areas in countries of low level of development? **[16]**

Indicative content

P1 : Why adaptation should be focused in rural areas

P2 : Why cities should also adapt

P3: Why mitigation efforts should be focused on Urban areas

- Climate justice : Cities cover around 2% of the Earth's surface but produce up to 70% of anthropogenic greenhouse gas emissions. Mainly from fossil fuel consumption from the high-consumption lifestyles of the wealthy and the production and transport systems are one of the primary causes of climate change. This has been exacerbated by the rapid rate of development, including accelerated industrialisation of the developing countries

- Cities are wealthier with most of the national wealth (GDP) concentrated there. Able to adopt and fund measures and technological solutions to reduce carbon emissions : green infrastructure, energy-efficient buildings, public transport system, electric cars, bike-friendly cities, greening of city, and promoting the use of renewable energy technologies and able to reach out to a more literate population on the need for energy conservation..
A well-planned, well-managed cities can play a central role in helping to mitigate against climate change

Cities have a key role to play in addressing climate change.

P4 : Why rural areas should also mitigate

- People living in rural settings are significant contributors to GHGs. High-carbon fuels are still used intensively. Many poor villagers burn charcoal, wood, or other biomass to cook and heat their homes. GHG emissions also come from farm practices such as wet rice cultivation (methane), fertiliser application (nitrous oxides) and deforestation which produces CO2 and removes a vital carbon sink.

- Rural areas (plains, open land, hills, coastal) often have the best possible conditions to harness wind and solar energy. These energy plants are land-intensive. Egypt has some of the best wind energy locations in the world. The Zafarana wind farm is the largest in Africa.

- The long term impact of climate change will be most felt by the rural residents who often are the worst affected. They can play their part in mitigation so that every bit they do now will hopefully help to reduce the future severity of the impact.

CONCLUSION

Negative impact of climate change does not respect geographic space, as they will affect all communities regardless of whether they are in rural or urban areas . It is not only the rural regions that will have to adapt and face the brunt of climate change neither is it the responsibility of cities alone to mitigate. Because of the speed at which climate change is happening due to global temperature rise, it is urgent that mitigation and adaptation need to be addressed simultaneously by human communities at all places. Delaying action can lead to irreversible consequences for humankind.

4 (a) Explain the distribution, frequency and effects of tropical cyclones. **[9]**

Indicative content

Refer to lect book

4 (b) To what extent is the occurrence of the tropical monsoon system the result of differential heating between the land and sea? **[16]**

Indicative content

P1 : Differential heating and cooling of land and water
creates low pressure on the landmass while the seas experience comparatively high pressure.
Due to different thermal capacities of land and sea. Sea heats up more slowly in summer (in N) and cools more slowly in southern hemisphere (winter) as more heat is retained in oceans.
Pressure gradient difference develops which triggers air mass movements from high to low pressure.

P2 : Shift of the position of the ITCZ across the equator
The alternate development of the high and low pressure systems and hence the reversal of winds is dependent on the migration of the thermal equator (ITCZ) which moves with the seasons.
Movement of the overhead sun towards the tropics of Cancer (NH) and Capricorn (SH) takes the zone of maximum insolation to these regions.
In spring, intense heating of the land begins , setting up a 'thermal low' over N.India, which begins to cause a reversal in the wind direction, drawing in moist air from the SW. in early summer, the southern jets begins to break down , allowing the movement northwards

P3 : Influence of the jet streams

P4 : Other factors for a fuller understanding of the tropical monsoon

- Mountainous terrain of the Himalayas and the Tibetan plateau.

etc

Conclusion :

Differential heating of the land and sea only offers a partial explanation. It is a necessary but insufficient condition to fully understand the mechanism of tropical monsoon.

To understand fully the mechanism of the monsoons, other factors such as the position of the ITCZ, upper westerlies and mountainous terrains have to be considered.

5 (a) Compare the impacts of traffic congestion in cities in countries at different levels of development. [9]

Indicative content

	HIC cities	LIC cities
Environmental problems	• In both cities, congestion releases pollutants into the air. Other than the sheer density of traffic, stop-and-start traffic (during traffic gridlock) means alternating between braking and accelerating. That burns more gas, spewing more toxic fumes into the air, contributing to air pollution.	
	• Less severe than LIC cities	• More severe than HIC cities : *According to research done by Green Peace in 2017, all top three cities with worst air quality are from LICs (1st : Jakarta, 2nd: Beijing, 3rd : Dhaka) . Exhaust fumes from vehicles are a key culprit.*
Social and economic problems	**More of economic and social costs associated with long hours in traffic** •	**Beyond economic and social costs associated with long hours in traffic, LIC cities experience social and economic problems that tend to threaten <u>CURRENT WELL-BEING</u> such as :** • Air pollution and associated health problems

5 (b) "Although there are solutions to managing traffic congestion, these solutions often bring other problems". With reference to cities in developed countries, discuss this statement. [16]

Indicative content

P1 : Problems associated with supply fix policies

P2 : Problems associated with demand management policies

P3 : Problems associated with other strategies

P4 : However, can be argued that some of these problems are short-term and can be easily reversed with specific policies

P5 : Despite these limitations, there are also strategies that bring benefits (positive externalities?) beyond curbing congestion

6 (a) Explain the indicators used to measure the management of non-hazardous waste in cities in developed countries. [9]

Indicative content

For developed countries, the key waste management issue is the **excessive generation of waste**. High-income regions tend to consume more, thus producing more waste. Thus, sustainability indicators to measure the management of non-hazardous solid waste revolve around measuring the extent/volume of waste generated.

P1 : Ecological footprint

P2 : Volume of waste generated

P3 : Waste diversion indicators

- This measures the volume of waste re-directed away from landfills.
- Possible indicators include : percentage of waste directed for energy recovery, percentage of organic waste that is composted, percentage of waste that is recycled
- The higher the percentage of waste diversion, the lower the volume of waste directed to landfills – this suggests higher levels of sustainability and a shift towards a circular economy

6 (b) "Waste should be viewed as a potential resource, not a problem". Discuss [16]

Indicative content

P1 : Recycling transforms waste into a resource

P2 : Recovery transforms waste into a resource

P3: Waste industry provides many job opportunities

P4 : However, in many contexts, waste can be more of a problem than a resource

Conclusion (Is waste a resource or a problem?)

- Waste should be considered a resource because of reusing, recycling and recovery efforts. However, the benefits of waste are not mobilized in all contexts. In fact, mounting volumes of waste are posing more of a problem than a resource in many cities worldwide
- Hence, it is evident that various factors are needed to transform a waste into a resource : beyond technology, political will and community engagement is also important.
- With mounting waste problems in both HIC and LIC cities, imperative for cities to invest in sustainable policies to manage waste.