Section A – Tropical Environments

1 **(a)** Explain the factors influencing aeolian processes in the arid tropics.

[12]

Indicative content

Responses should consider the wind (e.g. velocity) and surface characteristics (e.g. nature of sediments, vegetation cover) that influence the various aeolian processes (i.e. erosion, transportation and deposition).

Higher level responses will have a good coverage of both wind and surface characteristics as well as the different aeolian processes.

(b) Discuss the factors influencing mass movement in the tropics.

[20]

Indicative content

Responses can consider how natural and human factors contribute to mass movement through their influence on shear stress and shear strength.

Higher level responses may discuss the relative importance of natural factors such as heavy rainfall and tectonic hazards in contributing to mass movements through a consideration of their role as trigger mechanisms. The relative significance of human and natural trigger mechanisms can also be considered. The role of natural and human contributing factors can also be discussed in relation to relevant examples.

2 **(a)** Explain how channel morphology varies in the tropics.

[12]

Indicative content

Higher level response will be those that are able to show variation explicitly:

- Spatial variation across climates: humid (meanders tend to be found at areas with steady discharge e.g. tropical rainforest climate) vs. semi arid or arid (braided channels tend to be form in areas with an unstable flow regime e.g. monsoon/savanna climate)

- Spatial variation along length of channel: upper course vs. lower course
  - E.g. as we move downstream: form ratio gets higher, hydraulic radius gets larger, etc.

- Temporal variation: wet vs. dry season (e.g. Auranga River: wet season meander and dry season braided)

(b) To what extent do aeolian processes play the most important role in the formation of arid landscapes?

[20]

Indicative content

Responses can discuss the role of aeolian and fluvial processes in the formation of various arid landscapes such as yardangs, dunes, loess and rills and gullies.

Higher level responses will explicitly weigh the relative importance of aeolian and fluvial processes in the formation of the various arid landscapes. There is also a strong awareness of the conditions in the arid tropics that impacts the relative significance of aeolian and fluvial processes (e.g. the lack of precipitation; the rare but intense precipitation; the lack of vegetation cover). Strongest responses may even consider how the relative importance of aeolian and fluvial processes may have changed over time (e.g. as climates have changed).

Section B – Development, Economy and Environment

3 **(a)** Explain the relevance of the arguments made by Malthus and Harvey to resource scarcity in countries at different levels of development.

[12]

Indicative content

Responses should explain the specific arguments proposed in both Malthus' theory on food scarcity (AP Food vs Population GP, positive – negative checks) as well as Harvey's theories on relative scarcity (capitalism, labour, nature as capital) with an emphasis on relevance to a variety of context in countries at different levels of development. The strongest responses will be well supported with relevant examples.

(b) Discuss the challenges that states may face in governing the global economy.

[20]

Indicative Content

Responses should evaluate the ability of the state to govern (control and influence flows of goods/capital and other stakeholders – especially TNCS). The roles of the state that can be explored include: regulator of the economy, provider of public goods and services and business owner/ investor.

Stronger responses will be able to discuss specific conditions/factors e.g newly elected governments, competition for TNC FDI etc that limit (challenge) the ability of the state to govern at the global scale. The strongest responses will be well supported with relevant examples.

4 **(a)** Explain how the arguments in dependency theory and core-periphery model can help to account for the development gap at different scales.

[12]

Indicative Content

Dependency theory

- The development of cities and countries has depended on the accumulation of surplus value that occurs via a process of unequal exchange that extends from within countries to between countries at different levels of development.
    - Unequal exchange between the core and the periphery. Unequal exchange as the core buys the materials (primary resources) from the periphery for cheap, after value adding (through manufacturing), the product they produce is more expensive than the materials used to make it. They then sell the finished goods to the periphery at a much higher cost.
    - For the periphery, their exports earn a lot less than what they spend from the imports from the core, so it leads to trade imbalance earnings—allowing the core and periphery to continue to be rich and poor respectively.

- Therefore, the condition of less developed rural areas and/or countries at lower levels of development is not the outcome of inertia, misfortune, chance, climatic conditions, etc. but rather a reflection of the manner of their incorporation into the capitalist system where they are integrated at the bottom of the hierarchy of dependence.

- Hence the development gap can exist at different scales, within countries, and between countries at different levels of development.

Core-periphery model

- At various scales, sharp territorial contrasts exist in wealth, economic advancement, and growth between economic heartlands and outlying subordinate zones—the growth and prosperity of core regions is at the expense of exploited peripheral zones.

    - Within country: wealthy urban cores and depressed rural peripheries or prospering high-tech concentrations and declining manufacturing belts in many developed countries.

    - Between countries: core-periphery contrasts are discerned between Western Europe, Japan and the United States as prosperous cores and the countries at the lowest levels of development as underdeveloped peripheries.

- Idea that development gap should and will continue to exist in order to drive the growth of core regions, where eventually peripheral regions will benefit through the trickle-down effect. However, without intervention, trickle-down effect is usually minimal or non-existent—leading to the persistence of the development gap between core and peripheral regions.

(b) 'There are too many people on Earth relative to resources'. To what extent do you agree?

[20]

Indicative content

Responses could consider the dynamics of the population-resource relationship as proposed by the theories of Malthus, Boserup and Harvey. Evaluations of the statement should consider the complexities of scarcity (absolute vs relative) especially given a variety of possible resources (natural vs manmade, finite vs infinite).

Strong responses will be able to discuss specific contexts and conditions where the statement may hold true/false e.g. food supply in countries at higher levels of development vs lower levels of development. The strongest responses may consider even more variations e.g. rural vs urban areas in countries at lower levels of development and arguments will be well supported with relevant examples.

Section C – Sustainable Development

5 **(a)** Explain the limitations of replacing fossil fuels with alternative energy sources in countries at low levels of development.

[12]

Indicative Content

Responses should explain the limitations of various alternative energies (hydropower and nuclear energy) e.g. technical expertise, setup costs etc. as well as the reasons for the continued dominance of fossil fuels (coal, gas and oil) e.g. cost to consumers, versatile applications etc. in the context of countries at low levels of development. The strongest responses will be well supported with relevant examples

(b) 'All cities need to make sustainable urban development a priority'. Do you agree?

[20]

Indicative Content

- Sustainable urban development entails the integration of the three pillars of sustainability: economic, social, environmental, similar to the objectives of sustainable development, applied in a context i.e. urban areas or cities.

- All cities should (eventually) make sustainable urban development a priority.

Why is SD important? And therefore why is SD in cities so important that all cities should prioritise it?

- SD is defined as: 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs'.

- Fixation on economic growth had led to increasing environmental degradation and social inequality. Thus SD goes beyond economics to include considerations on the environment and society, where it aims to maximize the goals across the three interdependent dimensions of economic, social, and environment.

- Moreover, the socio-economic system that we live in cannot expand indefinitely since it is limited by the finite global biosphere and it is thus important for development to take into consideration the environment.

- As urbanization is one of the most significant trends of the past and present century, cities are increasingly becoming significant as places of mass production and consumption to drive overall human progress. But presently, cities are not delivering on their potential to help achieve sustainable development

    - *Economically*, the current model of urbanization is unsustainable due to widespread unemployment, the existence of unstable and low-paying jobs and informal income-generating activities, which create economic hardship, unequal access to urban services and amenities and poor quality of life for many.

- *Socially*, the current model of urbanization generates multiple forms of inequality and deprivation, which creates spatial inequalities and divided cities.

- *Environmentally,* the current model of urbanization favours economic activities, industries and infrastructure which are hotspots for energy consumption as well as key sources of greenhouse gases which contributes dangerously to climate change (cities have a large ecological footprint also)

    - Cities impose an environmental impact on their hinterlands and on ecosystems far beyond the immediate region, owing to their demand for renewable resources which cannot be met from within the city's boundaries.

    - Cities are also major producers of wastes, much of which impact upon the surrounding region.

- Thus if the development of cities is left unchecked, the above issues are likely to worsen.

- Therefore, efforts to attain SD should be focused on cities, and all cities should make SUD a priority.

- Moreover, the concentration of people in cities provides enhanced opportunities for a) enhanced scope of recycling and reusing, b) provision and use of public transport than private motor vehicles, c) economies of scale in providing essential basic services such as water and electricity, etc.

Although all cities should make SUD a priority, ***not all cities are able to make it a priority now***.

- Cities in countries at lower levels of development are likely to prioritise more immediate and pressing challenges such as those relating to economic development, or to the 'brown agenda' such as water supply, sewage and sanitation, and housing issues.

6 **(a)** Explain the impacts of urban reimaging on different stakeholders in cities in countries at high levels of development.

[12]

<u>Indicative Content</u>

- Different impacts on different stakeholders: local residents (how different income level would be affected?), domestic businesses (are certain businesses more impacted than the other?), government / city authorities

Higher level response would:

- Show how different stakeholders from the same city are impacted differently by the same project

OR

- Variations in impacts within stakeholder groups (e.g. different group of residents—employment, skills, where they live, different income level etc.)

(b) To what extent is it possible to fully address the impacts of climate change? [20]

Indicative Content

- Variation in level of effectiveness of individual strategies in fully addressing the impacts of climate change though adequate is not the highest level of response.

Higher-level response discusses the key challenges in fully addressing the impacts of climate change.

1) Willingness of governments to cooperate with each other—especially challenging when countries have their own interests to protect, or when they have other more urgent immediate issues to resolve.

    - Adaptive measure: transboundary water conflicts arising from building dams on transboundary rivers (to resolve increased likelihood of water scarcity)

    - Mitigative measure: MEAs such as the Kyoto Protocol and the Paris Agreement (reducing carbon emissions)

2) Financial ability and level of access to technology to implement strategies to fully address impacts of climate change is more limited in countries at lower levels of development.

    - Moreover, countries may be more disinclined to implement strategies such as reducing deforestation if the country's economy is heavily dependent on the very same activity.

    - Even if financial incentives (from external parties) for payment for ecosystem services such as 'Reducing Emissions from Deforestation and Forest Degradation' (REDD) are provided, the challenge of leakage may exist where in this case, the forest destroyers might move to another area of forest or to a different country. Worst still, the money may not be used for its intended purpose.

    - For countries at higher levels of development, even with adequate funds and access to technology to implement adaptive strategies such as building dams, the expected increase in frequency and intensity of climate change related extreme weather events can still overcome existing measures.

3) There are natural factors affecting climate change (Milankovitch theory) and humans are not able to influence it—though recent climate change has largely been attributed to being caused by anthropogenic activities.