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DUNMAN HIGH SCHOOL PRELIMINARY EXAMINATIONS Year 6

Answer Scheme for Papers 1 and 2

Paper 1

Theme 1: Tropical Environments

1a Explain the differences in channel processes in the tropics.***Indicative content***

The main factors to explain the differences would be discharge and sediment characteristics. There will be greater and continuous erosion and transport of load especially the suspended load due to the higher and regular discharge in the humid tropics albeit there will be seasonal differences in the seasonally humid climates. However, deposition will be more dominant in the arid tropics as the rivers are generally dry most of the time.

1b 'River channels in the tropics have very different characteristics.' Discuss the validity of this statement.***Indicative content***

The main argument is that the river channels in the humid and arid tropics are very different, but the counter-argument is that there are important similarities too e.g channels in both the seasonally humid and dry climates exhibit nested channels due to variations in levels of discharge. The presence of nested channels in the dry climates is a good synoptic link to the wetter past experienced by these climates.

2a Explain why tropical deforestation is a major environmental concern?***Indicative content:***

There are 2 key aspects in this response: the context and why the impacts are a 'major' environmental concern. To understand 'major', the impacts should be examined from a scale perspective. Global impacts would be atmospheric and biological: global warming and loss of biodiversity. The release of stored carbon has large-scale impact as these heat-trapping gases have a long lifespan leading to global warming concerns. It is especially a worrying trend in the tropics as the scale of deforestation is very large and growing rapidly especially in the Amazon Basin. At the regional scale, the lithological and hydrological impacts can be discussed.

2b 'The biggest challenge to effective management of tropical deforestation is political will'. Discuss.***Indicative content:***

A variety of legislative and regulatory measures have been established to protect forests. These include REDD+ (international partners), reforestation, protected areas, pledges. Much of the forest is owned by the state and so the state is able to have the legitimacy to implement strategies on a suitable scale to address the problems, but the state needs to have the political will to be committed to sustainable forest management practices.

- 3(a)** With reference to one or more TNCs, explain how these firm's production circuit operates at the global level.

Candidates would need to define what is meant as a production circuit: part of the global production network (GPNs) that TNCs operates on in order to find the "spatial fix" in the production network at the global level. Production circuit is a result of the international fragmentation of production processes in order to maximise profits based on comparative advantages certain locales have over others in some aspects of the production circuit. Production circuit includes inputs, transformation, distribution, consumption, additional inputs (technology, service and energy inputs) and control system such as logistics, financial and regulation).

Candidates would then highlight how these production circuit operates at the Global level. Can use either BMW or Shell as case studies or a combination of both.

Need not give more than 1 TNC if required as long as your case study covers all of the above mentioned aspects in detail.

- (b)** "Regional and international organisations are the most important actors in governing the global economy."

To what extent do you agree with this view?

Candidates would need to discuss the role of the regional and international organisations as the most important actor in the global economy or are these organisations merely an actor in the global economy. As such, a large portion of the essay must discuss the role of this entity at the global level.

The effectiveness of the role of international and regional organisations determined by 2 factors-

- 1) its bargaining power vis-à-vis other actors ("negotiated outcomes") and
- 2) the relative importance of other actors such as the state and TNCs in determining global trade policies.

Conclusion: Role of regional and international regulators are definitely an important agent in the global economy, but its importance is determined by its bargaining power with other global actors such as the state and TNCs.

- 4(a)** Explain the considerations when assigning ownership of water resource in countries at low levels of development.

Candidates would need to explain what are the various forms of ownership – public, private, semi-private in the form of concessions, management, leases, divestiture

Candidates would be required to explain the various considerations,

Social considerations, Economic & Technological Considerations and Political

- (b)** "International water agreements between riparian states is an effective strategy in managing transboundary water resources and their resultant conflicts."

To what extent do you agree with this view?

Candidates would need to identify a host of strategies in managing transboundary water resources which can include international water agreement within riparian countries, unilateral state directed basin management programs as well as evoking international principles in sharing of trans-border water resources so as to avert conflicts. These conflicts

would be over the quality and quantity of water resources. The success of these strategies is contingent to various criterions. Hence, trans-boundary agreements could be deployed to resolve potential conflicts if these considerations were fully tackled with.

Theme 3: Sustainable Development

5a Explain what sustainable development means to countries at different levels of development.

Indicative content

Sustainable development involves three interdependent dimensions: economic, social and environmental. Candidates may also include the key ideas of 'needs' and 'limits.' Responses should recognize that countries are at different levels of development and will prioritise their needs differently. A good explanation would entail the understanding of the different agendas (brown, grey and green) associated with the level of development and their implications on sustainable development.

5b 'Achieving sustainable development is more successful in some countries than others'. Discuss.

Indicative content

Having established the different understandings of SD to countries of various levels of development, the focus of this essay is to outline the possible challenges of achieving SD in selected countries. Sustainable development requires a planning agenda which maximises goals across the three dimensions. Candidates may explain that sustainable options are being adopted in key areas such as public transport, energy needs and water management. A higher level of response will show that sustainable development is contextualized to countries at different levels of development and acknowledge that all three dimensions of sustainable development are prioritized accordingly.

6a Explain how the ecological footprint and urban metabolism vary in cities of different levels of development.

Indicative content

Factors that can influence the ecological footprint and urban metabolism include demographic, socio-economic, economic and institutional factors. Generally, the ecological footprint will be high and unsustainable in the DC cities due to the greater consumption of resources and carbon emissions due to affluence and lifestyle needs. Urban metabolism is increasingly more circular in the European cities. Strong political will through policies and socio-cultural factors like education and societal norms have contributed to urban metabolism becoming more circular.

6b Evaluate the success of urban reimagining strategies adopted to improve the urban liveability of cities you have studies.

Indicative content

Success' should be outlined as to whether the reimagining strategies have been able to improve urban liveability. The key aspects of urban liveability are employment, housing, transport infrastructure as well as a clean, green and safe environment. Thus, successful outcomes would typically be the ability to attract businesses, middle class, creative talent and tourists that will result in widespread economic benefits leading to improved social and environmental liveability for all the urban dwellers.

Paper 2

Section A

Theme 4: Geographical Investigation

- 1 A student undertook an individual fieldwork exercise along part of the Park Connector Network (PCN) to assess the walkability of different parts (see Resource 1a).

The PCN is made up of linear open spaces which serve as pathways linking major parks, nature reserves and green spaces within the urban area.

Walkability is an element of liveability. Walkability is the extent to which the environment is conducive to walking for recreation and personal travel. It includes considerations of comfort, air quality lighting and safety, provision of amenities such as shelters, the path's accessibility for all users and its connectivity to other walking routes.

The student surveyed 30 sections of park connectors in the area investigated, totalling approximately 16km in length. She surveyed the sections on weekdays between 10:00 and 12:00hrs and between 14:00 and 16:00hrs over a 4-day period, avoiding one day when it rained heavily for most of the day.

A stratified random sample of sections from each of the following types of path were taken.

- Paths adjacent to canals
- Paths adjacent to roads.
- Paths adjacent to elevated train tracks.
- Paths within parks.

Equipment used:

- large scale map of the area investigated
- printed recording sheets and pen
- iPad

For each section of path, its characteristics, such as the location of benches, was recorded on the base map (see Resource 1b) and a copy of the recording sheet was completed (see Resource 2). Photographs were taken of key features, such as unclear signage which could lead to conflicts between walkers and cyclists.

After the surveys were completed the data was compiled and analysed so that conclusions could be made about the walkability of the paths in the area investigated.

Study Resources 1 to 3. Resource 1 shows the Park Connector Network (PCN) and area investigated as well as a base map recording the characteristics of one section of path. Resource 2 shows one of the recording sheets used in the survey. Resource 3 is a photograph of one section of park connector taken during the fieldwork.

- (a) Suggest a suitable geographical question for this investigation about walkability.

[1]

Does the Park Connector Network in the North East Section of Singapore have a high walkability index?

- (b) With reference to Resources 1 and 3, describe **two** potential risks associated with undertaking this fieldwork and explain how each risk could be minimised.

[4]

- Personal safety risk as shown in Resource 3 as the PCN is bounded by trees and vegetation that may create pathways that are isolated.
- Environmental risk as shown in resource 1 as the PCN can be exposed to the afternoon sun.
- Environmental risk as shown in Resource 1 as the PCN is quite extensive and stretches several kilometres.
- Environmental risks as shown in Resource 1 as the PCN abuts water bodies and major expressways
- Note* Must cite from both Resources 1 and 3 to get 4 marks.

- (c)** Explain the strengths and limitations of the data which was collected using the recording sheet shown in Resource 2. [6]

Strengths:

Walkability uses a range of indicators that are comprehensive

Whole range of sub-categories are likewise provided

Limitations:

Data collected is very generic and broad

Categories of "overall assessment" is misleading.

Note* Provide strengths and limitations to the answer with referencing to Resource 2.

- (d)** Using Resource 2, explain one data source that could provide information about walkability of paths for the elderly and describe an appropriate method to represent this data. [5]

Path slope/gradient could be considered to look at ease of walking for the elderly as the steeper the slopes, elderly using wheel chair or walking aids will face difficulty accessing those section of the paths.

Note* Draw a line graph highlighting slope gradient from a section of the PCN. (provide explanation (3 marks) and illustration (2 marks))

- (e)** Evaluate this investigation about the walkability of the area investigated and explain how it could be improved and extended. [9]

Accuracy:

The investigation carried out is generally quite accurate as it uses participant observations with the participant walking along the path to determine if it meets all the requirements for walkability. However, the accuracy of the study could be better improved by expanding the entire area of study to other locales within the PCN rather than just zooming in on the North-East section only as each section of the PCN may have spatial variations in terms of accessibility.

Reliability:

Investigator surveyed 30 sections over 4 days in bright and sunny weather. This study was done over a short period, conducted once in desirable weather and the place was not re-visited. The reliability of this study could be enhanced if a repeat visit would be conducted

- 2(a)** With reference to Resources 5A and 5B, compare the characteristics of the two river channels. [4]

The characteristics can be discussed in terms of the channel width, depth and the depositional landforms ie the mid-channel bars.

- (b)** With reference to Resources 5A and 5B, outline and explain the likely changes that will take place in the two river channels during the wet season.

Outline:

Channel width and depth of 5A will be smaller than that of 5B and vegetated bars will still remain in the channel [6]

LEVELS	MARKS	DESCRIPTORS
3	5-6	Well-developed Response demonstrates accurate knowledge and understanding of the effects of discharge on channel morphology. There is good balance in the response. Response is generally accurate, clear, with good data support and focus on the question.
2	3-4	Developed Response demonstrates some knowledge and understanding of the effects of discharge on channel morphology. There may be a lack of balance in the response. Response is generally clear, with some data support and focus on the question but there may be some lapses in the explanation.
1	1-2	Undeveloped Response demonstrates limited or no knowledge the effects of discharge on channel morphology. Response lacks clarity, details and focus on the question.
0	0	No creditworthy response

- (c)** With reference to Resources 6, outline one difference between the latitudinal limits of the active and the inactive dunes [2]

The active dunes are located further north between 13°N to 18°N

The inactive dunes are located nearer to the equator between 7°N to 13°N

- (d)** With reference to Resource 8A and 8B, explain the difference in slope stability. [4]

The reasons will be the height of the tree line – vegetation cover increases slope stability through the binding action of the roots and the amount of organic content that binds the soil. The type of weathered products and influence on slope is also an important reason.

- (e)** With reference to Resources 6, 7, 8A, 8B and your own knowledge, discuss the effects of past climate change on geomorphic processes in the tropics. [9]

Indicative content

Past climate change refers to the cooler and drier conditions associated with the LGM and the warmer and wetter conditions of the Holocene. This response should examine the effects of climate change across space and scale. Generally, the LGM encourages more physical weathering and wind processes and this is on a smaller scale and more evident at the high

altitudes of the tropics and the present arid tropics for wind erosion. However, during the Holocene, the wetter and warmer conditions encourage more chemical weathering, mass movement processes and water action on a larger scale in the tropics including the drylands.

LEVELS	MARKS	DESCRIPTORS
3	7-9	Well-developed Response demonstrates accurate knowledge and understanding of how past climate change has affected geomorphic processes in the tropics. There is good balance in the response Response is generally accurate, clear, with good data support and focus on the question.
2	4-6	Developed Response demonstrates some knowledge and understanding of how past climate change has affected geomorphic processes in the tropics. There may be a lack of balance in the response. Response is generally clear, with some data support and focus on the question but there may be some lapses in the explanation.
1	1-3	Undeveloped Response demonstrates limited or no knowledge of geomorphic processes. Response lacks clarity, details and focus on the question.
0	0	No creditworthy response

Theme 2: Development, Economy and Environment

Development and Managing Resource Base in Sub-Saharan Africa

- 3** Resource 8 shows Sub-Saharan Africa's mineral wealth of selected countries and commodities. Resource 9 shows changes in commodity prices vs Sub-Saharan Africa GDP Growth Rates. Resource 10 shows two indicators of development for Sub-Saharan Africa. Resource 11 shows an oil fire and resultant oil spill in the Ogoni delta in Nigeria, Africa

- (a)** Describe the distribution of Sub-Saharan Africa's mineral wealth and its impact on some of these countries in Resource 8. [5]

Many sub-saharan countries are resource rich with many of them accounting for significant portions of global production in some minerals.

Several Sub-Saharan countries are also heavily reliant on their mineral resources as a vital source of income.

Lastly, mineral wealth allows many Sub-saharan countries potential for even greater income streams if they are tapped.

- (b)** With reference to Resource 9, compare the relationship between the changes in commodity prices and GDP growth rates in Sub-Saharan Africa since 1961. [3]

Positive direct relationship between GDP growth and changes in commodity prices. Generally, when commodity prices increase, GDP growth of Sub-Saharan countries will likewise increase. The relationship is not immediate but has a short lag time. Cite figures to support your answer. This relationship is constant throughout.

- (c)** With references to Resources 8, 9 and 10 as well as your own knowledge, suggest **three** reasons why resource rich countries such as Nigeria have low levels of HDI. [6]

Nigeria has low HDI of 0.453 which is considered low due to a variety of reasons.

- Overly **dependence on raw materials or resources**.
- **Poor governance** as shown in Resource 10b where the revenue earned is not invested wisely in developmental projects or in infrastructure that can benefit the people of Nigeria.
- **Own knowledge**: corruption within the country which impeded distribution of income to the poorer communities,
- **Note*** Answers must contain references to resources 8-10 as well as your own knowledge.

- (d) With reference to Resource 11, explain how the extraction of minerals can affect the local environment. [4]

- Environmental impact in the **extraction** of oil resources.
- Transportation** of raw materials can pollute the environment due to accidents,
- Storage** of raw materials with poor storage conditions.

Any 2 of these activities can be discussed in some details with the resultant environmental impacts.

- (e) With reference to Resource 8 as well as any other resources and your own knowledge, recommend whether Guinea should build a new iron ore mine that produces bauxite. [7]

Benefits of iron ore mine for Guinea:

Economic Benefits: Revenue, Jobs

Social Benefits: Access to financial resources to build services such as clinics, hospitals, schools

Development potential: Revenue stream to plan development projects.

Negative impacts of iron ore mine for Guinea:

Economic: Resource curse and reliance on TNCs

Environmental: Strip mining and impacts on biodiversity, land and water bodies

Theme 3: Sustainable Development

Liveability and Sustainability in Cities

- 4 Resource 12 shows the EIU's Liveability index and WWF's Ecological Footprint. Resource 13 shows Circles of Sustainability for Melbourne, Australia and Port Moresby, Papua New Guinea (PNG) in 2013. Resource 14 shows an advertisement for plans to promote and develop a large scale tourism project on reclaimed land in Port Moresby, Papua New Guinea, a low income country.

- (a) Describe the relationship between the liveability index and ecological footprint as shown in Resource 12. [4]

-Generally, cities that score very highly in the liveability index have a larger ecological footprint as well. Reverse applies for low liveable cities such as Dhaka (38 out of 100, 0.6ha per capita)

- Cities with low density car oriented cities however score higher in the ecological footprint (e.g: Melbourne at 98 out of 100 but ecological footprint of 7.8 per capita) with similar cities that are compact transit-oriented cities (e.g. Vienna at 98 out of 100 and ecological footprint of 5 ha per capita) though both of these cities have similar liveability indexes.

-Other anomalies will be cities at moderate levels of liveability but having very high ecological footprints as well e.g: Dubai at 72 out of 100 but ecological footprint of 9.6ha per capita.

- (b) With reference to Resource 13, compare the performance in the scoring for sustainability for Melbourne and Port Moresby. [4]

-Melbourne scores very highly in 3 of the 4 dimensions in the economics, political and culture areas than Port Moresby

-Melbourne's performance in their sustainability is consistently rated at above satisfactory and higher as compared to Port Moresby where nearly all indicators are measures as Basic to critical.

Provide supporting evidences for your answer.

- (c) With reference to Resource 12 and 13, suggest **three** reasons to account for the differences in liveability between Melbourne in Australia, and Port Moresby in Papua New Guinea. [6]

- Melbourne and Port Moresby (38 out of 100). Melbourne is a city in a Developed economy, as such it has access to funds and expertise that allows the city residents to build a better environment and provide amenities and facilities in meeting the needs of its population Most urban issues in Melbourne have been addressed
- Better access to social and cultural services

- (d) With reference to Resource 12 and 13 suggest ways in which Melbourne, Australia can score higher in its sustainability ratings. [4]

- Provide more sustainable public transport system
- Provide more sustainable building materials
- Reduction of energy through the promotion of cleaner energy

- (e) Imagine that you are the city planner for Port Moresby, Papua New Guinea. You are tasked to evaluate the viability of developing a large scale tourism flagship project on reclaimed land in Port Moresby. With reference to Resources 12, 13, 14 and your own knowledge, assess if this project meets the needs of its residents. [7]

- Port Moresby is a city with a low liveability score (Resource 12) and with poor performances in all dimensions. Most of its scoring is at the basic and unsatisfactory level with great need to address wealth distribution (Economic dimension) and safety concerns (political dimension)(Resource 13). As such, to build a tourism flagship project, it must first address the economic and political dimensions. Hence the tourism flagship project must meet some criterion for it to be considered.