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DUNMAN HIGH SCHOOL PRELIMINARY EXAMINATION YEAR 6

HIGHER 2 GEOGRAPHY PAPER 1

9173/01

Monday

22 September 2025

3 hours

Additional materials: Insert

Section A

Answer **both** questions.

Cluster 1: Development, Economy and Environment

- 1 Resource 1 shows the Mineral Contribution Index by country in 2018. Resource 2 shows the price of lithium and cobalt from 2016 to 2023. Resource 3 shows the landscape of an area after mining took place in Australia. Resource 4 shows changes in intra-ASEAN trade as a share of total trade for ASEAN member states between 2004 and 2023.

(a) Explain the characteristics of extractive industries.

[6]

Award 1 mark for each explanation of a characteristic of extractive industries, to a maximum of 5 marks. Award a maximum of 1 additional mark for further development of each explanation, where applicable.

Possible responses include:

- These industries are found in **specific locations** because they mine non-renewable and locationally specific resources which are found only in certain geological formations. [1 mark]
- They are **capital-intensive** because they require significant upfront investment in machinery, infrastructure, and exploration even before extraction begins. [1 mark]
- They are **technology-intensive** because in order to extract resources on a large scale, advanced equipment and drilling methods are required. [1 mark]
- These industries are **dominated by large private and state-owned firms** because such operations require vast financial resources and technical expertise, which smaller companies typically lack. [1 mark]

(b) Describe the pattern of Mineral Contribution Index (MCI) shown in Resource 1.

[4]

Award 1 mark for each description of a pattern of the MCI. Award maximum of 2 marks for responses with only descriptions of places with the same MCI value.

Possible responses include:

- Every continent contains a country scoring at least 20 on the MCI. [1 mark]
- Africa is the continent with the most countries scoring at least 80 on the MCI, with at least 11. [1 mark]
- Out of all continents, Europe is the least reliant on minerals for their economy, with around half its countries scoring above 20 but less than 40. [1 mark]

- Asia and South America each have countries spanning the full range of scores on the MCI, with representation at all values. [1 mark]

- (c)** With reference to Resources 1 and 2, suggest why the economic impacts of extractive industries vary between countries. [6]

Award 1 mark for each suggestion on why economic impacts vary, to a maximum of 6 marks. Award a maximum of 1 additional mark for further development of each suggestion, where applicable.

Possible responses include:

- Economic impacts vary due to the **difference in extent of resource endowment**; countries with higher MCI scores in R1 may potentially have more abundant mineral resources, enabling greater export revenue than countries with less mineral resources. [1 mark]
- Economic impacts vary due to the **market price of different extractive products**. For example, based on R2, revenue would be higher for countries which extract cobalt versus countries which extract lithium carbonate before 2022, assuming they extracted same amount. [1 mark]

- (d)** With reference to Resource 3, explain how mining may harm the environment. [4]

Award 1 mark for each explanation of how mining may harm the environment, to a maximum of 4 marks. Award a maximum of 1 additional mark for further development of each explanation, where applicable. Award maximum of 2 marks for explanations related to a specific sphere.

Possible responses include:

- (Hydrosphere) The bare rock faces and sparse vegetation increase vulnerability to erosion, which can cause sediment to flow into nearby rivers and streams. [1 mark]
- (Atmosphere) Mining operations depend heavily on machinery such as excavators and trucks which run on diesel or are powered by coal-generated electricity, releasing large amounts of carbon dioxide, a major greenhouse gas into the atmosphere. [1 mark]

- (e)** With reference to Resource 4, describe the changes in intra-ASEAN trade as a share of total trade for ASEAN member states between 2004 and 2023. [5]

Award 1 mark for each description of changes in intra-ASEAN trade as a share of total trade, to a maximum of 5 marks. Award a maximum of 1 additional mark for further development of each description, where applicable.

Possible responses include:

- As a whole, changes in intra-ASEAN trade as a share of total trade fell from around 24% in 2004 to 21% in 2023.
- Malaysia, the Philippines, and Thailand all recorded increases in their intra-ASEAN trade share between 2004 and 2023, by around 2%, 7% and 2% respectively. [1 mark]
- Singapore and Vietnam recorded decreases in their intra-ASEAN trade share between 2004 and 2023, by around 5% and 9% respectively. [1 mark]

- (f)** Explain the influence of Association of Southeast Asian Nations (ASEAN) on TNCs and states. [5]

Award 1 mark for each explanation of influence of ASEAN on TNCs and states, to a maximum of 5 marks. Award a maximum of 1 additional mark for further development of

each explanation, where applicable. Award maximum of 3 marks for explanations related to only either TNC or states.

Possible responses include:

- The ASEAN Free Trade Area (AFTA) reduces tariffs among member states, encouraging TNCs to set up their Global Production Networks in the region to take advantage of lower trade barriers. [1 mark]
- ASEAN states receive a higher inflow of capital flows through initiatives like the ASEAN Investment Area (AIA), which is aimed at promoting investment facilitation and liberalisation among the ASEAN member states. [1 mark]

Cluster 2: Tropical Environments

- 2 Resource 5 shows the distribution of annual summer monsoon rainfall totals in India from 1901 to 2010. Resource 6 shows a classification of mass movements according to water content and velocity. Resource 7 shows land use change in the Indian section of the Ganges-Brahmaputra Delta from 2001-2002 to 2010-2011.

- (a) Describe the distribution of annual summer monsoon rainfall totals for India from 1901 to 2010 as shown in Resource 5. [5]

Award 1 mark for each description of annual summer monsoon rainfall total, to a maximum of 5 marks. Award maximum of 2 marks for responses with only descriptions of rainfall amounts with the same number of years.

Possible responses include:

- [Most frequent value] The most frequent monsoon season rainfall amount is 930mm, which occurred in 20 out of 110 years. [1 mark]
- [Least frequent value] Extremely high totals above 1100mm are rare, occurring in only 2 out of 110 years. [1 mark]

- (b) With reference to Resource 5, suggest reasons for the variation in annual summer monsoon rainfall. [6]

Award 1 mark for each suggestion for the variation in annual summer monsoon rainfall, to a maximum of 6 marks. Award a maximum of 1 additional mark for further development of each suggestion, where applicable.

Possible responses include:

- The variation can be due to the **difference in duration and onset of the monsoon**; an earlier onset can lead to a longer rainy season and higher annual totals, while a delayed onset may shorten the season and reduce totals. [1 mark]
- The variation can be due to influence of **other synoptic circulations**. For example, phenomena like **El Niño** associated with weaker trade winds can weaken monsoon winds and reduce rainfall to below 800mm seen in R5. [1 mark]

- (c) Describe the differences in mass movements shown in Resource 6. [4]

Award 1 mark for each description of difference in mass movement, to a maximum of 4 marks. Award a maximum of 1 additional mark for further development of each description, where applicable.

Possible responses include:

- In terms of **water content**, there is low water content in rock fall, moderate water content in soil creep and debris slide, and high water content in debris flow. [1 mark]
- In terms of **velocity**, the slowest movement is soil creep (max less than 1mm/day), followed by debris slide (max less than 1cm/sec), followed by debris flow (max less than 10m/sec). Rock fall is the fastest (max 100m/sec). [1 mark]

(d) Suggest reasons for the range of velocity for debris slide shown in Resource 6. [4]

Award 1 mark for each suggestion of for the wide range of velocity for debris slide, to a maximum of 4 marks. Award a maximum of 1 additional mark for further development of each explanation, where applicable.

Possible responses include:

[Gradient] On steeper slopes, gravity exerts a stronger downslope force, causing debris slides to move faster, whereas gentler slopes slow the movement. [1 mark]

[Soil moisture levels] When moisture levels are higher, water lubricates the slip plane/sliding surface and reduces friction, leading to greater velocities, whereas drier conditions result in slower slides. [1 mark]

(e) With reference to Resource 7, describe the land use change in the Indian section of the Ganges-Brahmaputra Delta from 2001-2002 to 2010-2011. [5]

Award 1 mark for each description of land use change, to a maximum of 5 marks. Award a maximum of 1 additional mark for further development of each description, where applicable.

Possible responses include:

- The increase in urban settlement (brown) is significant, especially in the north and north-western parts of the delta, indicating rapid urbanisation between 2001–02 and 2010–11. [1 mark]

- Rural settlements (red) have also expanded across large areas, especially in the north, north-western and central parts of the delta. [1 mark]

(f) Explain how the land use change shown in Resource 7 may impact ecosystem services provided by the Ganges-Brahmaputra Delta. [6]

Award 1 mark for each explanation of how land use change may impact ecosystem services, to a maximum of 6 marks. Award a maximum of 1 additional mark for further development of each explanation, where applicable. Award maximum 3 marks for responses with only explanations related to 1 type of ecosystem services e.g. provisioning.

Possible responses include:

- The replacement of single cropland with double and triple cropland increases **provisioning services** such as food production because more harvests can be obtained from the same plot of land within a year, thereby raising overall yield. [1 mark]

- However, the replacement of single cropland with double and triple cropland can reduce **supporting services** in the long run because intensive farming depletes soil nutrients and reduces soil fertility, undermining the ability of ecosystems to sustain future crop growth. [1 mark]

Section B

Answer **either** Question 3 or Question 4 and answer **either** Question 5 or Question 6.

Cluster 1 Development, Economy and Environment

- 3** Evaluate the view that human inventiveness can overcome the limits imposed by the natural environment on population growth. [20]

Indicative Content

Candidates may argue that human inventiveness expands the resource base through innovations like the Green Revolution, renewable energy, and desalination, supporting population growth. However, candidates should also recognise its limits: environmental degradation, finite non-renewables, and unequal access. Thus, while inventiveness can delay natural constraints, it cannot fully overcome them, with governance and equity shaping outcomes across regions and scales.

- 4** Evaluate the influence of states over the operations of TNCs. [20]

Indicative Content

Candidates could analyse how states influence TNC operations, ranging from limited control in weak governance contexts to more balanced interdependence where capital flows are encouraged, and strong regulation where states exert significant authority. Influence varies across global production networks, shaped by governance capacity, economic dependence, institutional strength, and the relative bargaining power between states and TNCs.

Cluster 2 Tropical Environments

- 5** 'The influence of global scale circulations on rainfall patterns in the tropics is significant.'
Evaluate this statement. [20]

Indicative Content

Candidates could evaluate the influence of Hadley cells on tropical rainfall using space and scale. At the macro-scale, Hadley cells shape rainfall magnitude, seasonality, and spatial extent across humid, seasonally humid, and arid zones. Their seasonal migration drives ITCZ shifts, while synoptic-scale systems like monsoons and El Niño further modify or disrupt established rainfall patterns, highlighting multi-scalar influences.

- 6** Evaluate the factors influencing the formation of karst landforms. [20]

Indicative Content

Candidates could adopt a factors-based approach to karst formation, emphasising climate, lithology, and hydrology across macro and local scales. Climate shapes water availability and carbonation processes; lithology determines dissolution potential and cave or speleothem development; hydrology drives dissolution, cave enlargement, and tower evolution. Human activities influence locally, but natural factors remain dominant in shaping karst landscapes.