



Catholic Junior College
JC2 Preliminary Examinations
Higher 2

GEOGRAPHY

9173/01
23 August 2024
3 hours

READ THESE INSTRUCTIONS FIRST

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.

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

Write in dark blue or black pen on both sides of the paper.
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 Question 1 in **Section A**.
Answer both questions in **Section B**.
Answer **two** questions in **Section C**.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [] at the end of each question or part question.

Section A

Answer **both** questions

Cluster 1 Development, Economy and Environment

1	Resource 1 is a map of copper reserves worldwide, in millions of metric tonnes, in 2022 and shows the copper exports of Peru and Chile in that same year. Resource 2 is a map of global consumption of copper in 2021. Resource 3 is a graph of the price of copper between 2013 and 2017, showing the impact of a workers' strike in February 2017 on the price of copper. Resource 4 is a photo of Escondida mine, the world's largest producer of copper, located in Chile.		
	(a)	Cite data from Resource 1 to describe the flow of copper from Chile and Peru.	[5]
		<i>Award 1m for each response.</i> <u>Possible responses</u> - Highest export destination for both Chile and Peru is China (worth a total of \$37.7bn) - Japan is the second highest, worth at a total of \$5.24bn - US is third highest for both countries, worth a total of \$4.64bn - South Korea is fourth highest for both countries, worth a total of \$3.91bn - Though closest, Brazil is lowest for both, worth a total of \$2.21bn AO2	
	(b)	Describe the consumption of copper shown in Resource 2.	[5]
		<i>Award 1m for each response.</i> <u>Possible responses</u> - Highest consumption in China of 13,778,000 metric tonnes in 2021. - This is about 7.6 times the consumption of the second largest consumer, the US, at 1,808,000 metric tonnes. - Asia appears to be a significant region of consumption, totalling double the amount of the US even without including China at 3,630,000 tonnes. - Aside from Germany, Spain, Belgium and France, the rest of Europe consumes relatively little copper. - Some countries do not consume copper at all, as seen in the majority of Africa and Mongolia. AO2	
	(c)	With reference to Resources 1 and 2, suggest reasons for copper exports from Chile and Peru in 2022.	[5]

	<i>Award 1m for each response. Award 1 additional mark for further development, where appropriate.</i> <u>Possible responses</u> - From Resource 1, Chile has the highest amount of copper reserves (190m metric tonnes) in the world, followed by Australia and Peru. It stands to reason that they are a source of the world's copper. - Japan, South Korea, and Brazil are not even represented as sources of copper. However, they consume significant amounts of copper, as seen in Resource 2 - o Japan consumes 977,000 metric tonnes, the third highest after China and the USA. - o South Korea is the fourth highest at 644,000 metric tonnes. - o Brazil is world ninth, at 321,000 metric tonnes. - Consumption of copper could be fuelled by demand for low-carbon electricity sources, such as in the production of solar photovoltaic batteries and battery storages. - While China and the US have stores of copper, the total amount is not sustainable given consumption patterns, fuelling demand for traded copper - Trade agreements could exist between Chile, Peru and destinations due to their proximity within the Latin American region AO2	
	(d) Referring to Resource 3, explain how labour can impact extractive industries.	[5]
	<i>Award 1m for each response. Award 1 additional mark for further development, where appropriate.</i> <u>Possible responses</u> - Availability of labour could decrease the cost of copper due to possibly higher extraction. - Labour strikes can increase the prices of commodities since supply would decrease. - o This could have knock-on effects worldwide on economic activity that depends on the supply of the raw material - o Data cited - Labour strikes can also result in higher wages, thereby resulting in higher costs which may be passed on to consumers. - Labour can halt economic activity if it organizes, depending on how dependent an industry is on its labour force - Extractive industries continue to be vulnerable to labour in spite of capital intensiveness, because skilled labour is required in the form of site supervision and engineers. AO2	
	(e) Explain how extractive industries may impact ecosystem services of	

		their immediate environment.	[4]
		<i>Award 1m for each response. Award 1 additional mark for further development, where appropriate.</i> <u>Possible responses</u> - Extractive industries threaten longevity of provisioning services through zero sum extraction of resources - In order to reach ores, clearing of land means reduction of provisioning services from natural flora and fauna and groundcover. - Removal of tree cover reduces the regulating service of trees in the carbon cycle - Removal of tree cover also reduces the supporting service of trees in supporting biodiversity of the region AO1	
	(f)	Explain population-resource relationships according to Malthus and Boserup.	[6]
		<i>Award 1m for each response. Award 1 additional mark for further development, where appropriate. Award of maximum of 3m if only one theory is explained.</i> <u>Possible responses</u> - Working from his understanding of agriculture, Malthus believed that resources increase at an arithmetic progression, whereas population tended to increase exponentially. - Population could one day outstrip resource development. - o When that happened, a series of checks and balances in the form of conflict, disease, or famine, would result in the population adjusting itself below resource base. - Malthus advocated for the population to therefore 'check' itself before exceeding the resource base. - Boserup, on the other hand, observed through the Green Revolution that man innovated to circumvent Malthus's positive checks. - Boserup believed that innovation and technology could expand the resource base once population started approaching it. This results in a stepped curve of resource base expansion. AO1	

Cluster 2 Tropical Environments

2	Resource 5 is a climograph of a region in North-West Botswana. Resource 6 is a map of Botswana. Resource 7 shows the elevation of the Mekong River delta above sea level.		
	(a)	Citing data from Resource 5, describe the characteristics of Botswana's climate.	[4]
		<i>Award 1m for each response. Award 1 additional mark for further development, where appropriate.</i> <u>Possible responses</u> - Temperature fluctuates throughout the year. - o Lowest temperature in July of about 18 degrees Celsius - o Highest temperature in October of 28 degrees Celsius - Seasonal precipitation - o Highest precipitation in January of about 190mm. - o Dry season from April to October, with July and August having no precipitation at all. AO2	
	(b)	Referring to Resources 5 and 6, explain the climate characteristics of Botswana.	[6]
		<i>Award 1m for each response. Award 1 additional mark for further development, where appropriate.</i> <u>Possible responses</u> - Botswana is located between 20 and 25 deg S of the equator, lying in the path of the migrating ITCZ. - Due to tilt of the earth and its orbit around the sun, the Hadley cell migrates south-wards in December. - This brings convergence of surface winds - Convectional rain forms at the convergence zone, and may be responsible for the heavy precipitation seen between December and February. - Temperatures should be higher as well, although they are ameliorated by high latent heat. - As the earth tilts away from the sun in June, and the Hadley cell migrates northwards, both temperature and precipitation fall, resulting in dry and cold conditions (18degC and no rain in July and August). AO2	
	(c)	With reference to Resource 5, explain how climate can influence weathering processes in Botswana.	[5]
		<i>Award 1m for each response. Award 1 additional mark for further</i>	

	<i>development, where appropriate.</i> <u>Possible responses</u> - High temperatures in Botswana (above 18degC annually, with peak of 28degC in October) can accelerate chemical reactions - o Van Hof't's rule - During rainy months of November to March, abundant rainfall increases the probability of chemical weathering due to the presence of water for hydrolysis and solution processes - The annual temperature range of 10degC (18degC in July vs 28degC in October) suggests that there may be thermal weathering of rock, particularly where diurnal range may be high during periods of low rainfall from May to September. - Seasonal variation in rainfall can result in expansion and contraction of materials, resulting in further breakdown or pressure release. - Vegetation in the tropics can also exploit lines of weaknesses in joints, further exposing rock to weathering agents AO2	
	(d) Explain the factors influencing the formation of meanders.	[4]
	<i>Award 1m for each response. Award 1 additional mark for further development, where appropriate.</i> <u>Possible responses</u> - Helicoidal flow develops as a consequence of water moving around a bend, creating a spiral motion. Helicoidal flow results in differential erosional rates - Erosion occurs on the outer, concave bank due to high velocity of water impacting the bank. This results in hydraulic action, or abrasion, on the river bank, carving out a river cliff. - Deposition occurs on the inner, convex bank due to a compensatory return flow that transports materials to the inner bank, resulting in the formation of a point bar, or slip-off slope. - Over time, alternating erosion and deposition increases the meanders curvature and sinuosity, creating a feedback loop that results in possible formation of ox-bow lakes. - Nature of bank material can influence the extent to which meanders curve since resistance of material can influence where erosion occurs more readily - Gradient of the river can influence velocity changes, therefore leading to increased meandering if gradient (and velocity) is lowered. AO1	
	(e) Describe the features of the Mekong River delta as shown in Resource 7.	[5]
	<i>Award 1m for each response. Award 1 additional mark for further</i>	

	<i>development, where appropriate.</i> <u>Possible responses</u> - The Mekong River continues to flow about 200km across delta sedimentation - The river breaks into four main distributaries - o The distributaries continue to meander - Elevation above sea level is highest at the mouth of the river, at about 4m above sea level. - Elevation slopes downwards as the river empties into the sea, with the majority being about 0.75 to 1m above sea level. - There is an anomaly in the southern tip of the delta, where elevation above sea level suddenly increases to 1.5m. - The delta empties into the South China Sea AO2	
	(f) Explain how a delta forms over time.	[6]
	<i>Award 1m for each response. Award 1 additional mark for further development, where appropriate.</i> <u>Possible responses</u> - Tropical rivers transport large amounts of sediment in suspension from upstream processes. - o This sediment is largely clay due to weathering processes in humid tropics, and attrition in transport. - As the discharge meets the sea or lake, velocity decreases due to the presence of a larger stable body of water - As it loses energy, excess sediment is deposited. - o Larger particles are deposited first, while finer particles may undergo flocculation before being deposited - The deposited sediment accumulates, forming new land which may be further colonized and stabilized by vegetation. AO1	

Section B

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

Cluster 1 Development, Economy and Environment

3	‘The use of renewable energy sources will always lead to trade-offs in sustainable development.’ Evaluate this statement.	[20]
	Possible Approaches: Candidates could approach the question by making a judgement on whether renewable energy sources will always lead to trade-offs in sustainable development through a consideration of trade-offs associated with the economic, social and environmental dimensions of sustainable development. Candidates could analyse the influence of the management of renewable energy sources such as solar power and hydropower and its impact on sustainable development. Candidates could also approach the question by making a judgement on whether renewable energy sources will always lead to trade-offs in sustainable development in some contexts than others through a consideration of two or more case studies. Candidates could analyse the contextual factors such as the nature of management and location of renewable energy sources that may have contributed to the differences in trade-offs. <i>Levels marked using Generic Level Descriptors for 20m H2 essays.</i> AO3	
4	Evaluate the influence of multilateral institutions on economic activities.	[20]
	Possible Approaches: Candidates could approach the question by making a judgement on whether multilateral institutions have a significance influence over economic activities through a consideration of the relative significance of multilateral institutions vis-à-vis other actors such as states and labour. Candidates could analyse the influence of multilateral institutions such as ASEAN, WTO and World Bank over economic activities such as the impact on trade and capital flows, and the degree to which multilateral institutions can exert influence on TNCs and states. Candidates could also approach the question by making a judgement on whether multilateral institutions have a more positive or negative influence on economic activities in some contexts than others through a consideration of two or more case studies. Candidates could analyse the	

	contextual factors such as the nature of economic activities and the aims of multilateral institutions in trying to influence them, which may have contributed to the differences in the significance of multilateral institutions. <i>Levels marked using Generic Level Descriptors for 20m H2 essays.</i> AO3	
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Cluster 2 Tropical Environments

5	Evaluate the influence of synoptic scale circulation on fluvial processes in the tropics.	[20]
	Possible Approaches: Candidates could approach the question by making a judgement on whether fluvial processes are influenced by synoptic scale circulation through a consideration of the relative significance of synoptic scale circulation vis-à-vis other natural factors or human factors. Candidates could analyse the spatial and/or temporal scale of the influence of the different factors to evaluate their relative significance. Candidates could also approach the question by making a judgement on whether synoptic scale circulation has greater influence in some contexts than others through a consideration of two or more case studies. Candidates could evaluate the significance of synoptic scale circulation in each case study and analyse the interplay between factors. <i>Levels marked using Generic Level Descriptors for 20m H2 essays.</i> AO3	
6	‘Human-induced changes to geomorphic processes greatly impact ecosystem services provided by deltas.’ Evaluate this statement.	[20]
	Possible Approaches: Candidates could approach the question by making a judgement on the extent of impact on ecosystem services provided by deltas because of human-induced changes to geomorphic processes. Candidates could analyse the changes to geomorphic processes due to human activities and evaluate whether these have impacted ecosystem services irreversibly. Candidates could also approach the question by evaluating the extent to	

	which human-induced changes to geomorphic processes have impacted ecosystem services, both negatively and positively. Candidates could analyse the human-induced alterations that have led to negative impacts on ecosystem services, while also considering interventions that have enhanced the resilience of deltas and the ecosystem services they provide. <i>Levels marked using Generic Level Descriptors for 20m H2 essays.</i> AO3	
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