VICTORIA JUNIOR COLLEGE
JC2 PRELIMINARY EXAMINATION 2023
HIGHER 2

ECONOMICS

9570/01

Paper 1

12 September 2023

2 hour 30 minutes

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

An answer booklet will be provided with this question paper. You should follow the instructions on the front cover of the answer booklet. If you need additional answer paper, ask the invigilator for a continuation booklet.

Answer **all** questions.

The number of marks is given in brackets [ ] at the end of each question or part question.

Answer **all** questions.

Question 1: The evolving demand for commodities

Figure 1: Global lithium prices*, mid-2017-2020

*Lithium is traded as lithium carbonate. Price is in Chinese Yuan per tonne.

Source: Tradingeconomics.com

Extract 1: Sodium-ion battery a new alternative to lithium-ion battery

In July 2021, China's Contemporary Amperex Technology Co. Limited, or CATL for short, became the first major automotive battery maker to unveil a sodium-ion battery, saying it planned to set up a supply chain for the new technology. As electric vehicles (EVs) become increasingly popular, demand for key lithium-ion battery ingredients, particularly cobalt, has spiked. This has spurred car producers and battery makers to seek alternatives to the current lithium-ion batteries.

The sodium-ion batteries do not contain lithium, cobalt, or nickel. CATL did not disclose cost details of the new batteries. The energy density, or amount of energy stored per unit volume, of its new sodium-ion batteries is still lower than that of lithium-ion batteries, Huang Qisen, deputy head of CATL's research centre told an online briefing. But he added that they perform well in cold-weather and fast-charging scenarios.

Source: Reuters, July 29 2021

Extract 2: Indonesia bans mineral exports to move up value chain

Indonesia is taking control of its mineral resources, incentivising investment in processing facilities and shifting the international balance of economic power. From Asia to Europe to the United States, multinationals have made moves into Indonesia to secure access to its vast reserves of nickel, as the country's export restrictions fuel competition for an essential metal for lithium-ion EV batteries.

In August 2019, the Indonesian government announced that exports of nickel ore would be banned starting January 1, 2020. This policy was aimed at slowing the depletion of nickel ore reserves while promoting investment in processing facilities within the country.

The policy has already borne fruit.

On December 15, 2021, German chemical company BASF and French mining and metallurgy company Eramet announced that they “have signed an agreement to jointly assess the development of a state-of-the-art nickel and cobalt hydrometallurgical refining complex.” Hyundai Motor and LG Energy Solution of South Korea also announced they had started construction of an EV battery factory on the island of Java.

However, the ban also provoked a reaction from the European Commission, which mentioned in a statement released that the European Union has requested the establishment of a panel at the World Trade Organisation to seek the elimination of unlawful export restrictions imposed by Indonesia on raw materials.

Source: Asia Times, February 22, 2022

Extract 3: Indonesia is poised for EV riches, but a nickel rush could hurt the environment

As American EV maker Tesla considers making a hefty investment in Indonesia, concerns are growing over the potential environmental consequences of a nickel mining rush.

Nickel mining in Indonesia has a dirty track record and the rush to extract and process more of it will add pressure to an industry with opaque rules and regulations.

“Mining is an unsustainable production. You must consume large amounts of fossil fuel to power the machines for clearing forests, digging the earth, and transporting ore. The more nickel ore is produced, the more fossil fuel is consumed, which has a great impact on climate change,” Arianto Sangadji, a leading researcher on the industry, said.

Dirty aspects of nickel mining are expected to be difficult to mitigate. From the mines to the smelters, nickel leaves an impact, on local ecosystems and on climate change.

But the opportunity for Indonesia remains enormous; one potentially even more valuable than its vast palm oil industry. The International Energy Agency predicts that some 70 million EVs will be on roads by 2025 and a huge number could contain battery parts mined and manufactured in Indonesia.

Source: CNA, 28 Feb 2021

Extract 4: Policies towards a fossil fuel-free economy

To mitigate climate change and create a fossil fuel-free economy, the global community has agreed that greenhouse gas emissions must be reduced rapidly and significantly.

Lithium-ion batteries have been a promising clean technology in two sectors most responsible for greenhouse gas emissions: transport and electricity generation. This is because the battery stores energy in its cells, as opposed to generating energy by combusting fossil fuels in a gasoline and diesel engine, to power a vehicle or provide electricity to a building. By recharging batteries with fossil fuel-free electricity, lithium-ion batteries fully contribute to a fossil fuel-free economy.

Further decline in prices of lithium-ion battery and its improved energy capacity would partly depend on continued research and development (R&D) efforts. Fiscal support can catalyse such efforts by improving their financial returns, but governments must also account for the significant uncertainty of the cost of such support. While subsidies give governments more control in terms of the recipients of the support as well as the direction of innovation, its effectiveness relies on how well governments can target their subsidies, based on relevant information on the size and reach of direct and spillover effects of selected R&D activities. Furthermore, direct subsidy or preferential tax treatment can be given to firms when lithium-ion batteries are installed in their products. For example, levy and grid tariff exemptions can be given to electrical grid operators when they use lithium-ion batteries to increase renewable energy capacity. For EVs, countries introduced measures such as exemptions or rebates on road toll to accelerate their adoption.

Besides market-based instruments, non-market-based instruments that involve imposing obligations or introducing non-monetary incentives also play a role in supporting lithium-ion battery installation.

In some areas such as EVs, there has been a recent shift from market-based instruments such as direct subsidies to non-market-based instruments. Authorities in some countries have introduced zero-emission vehicle mandates. Others established low-emission zones, where only electric or hybrid cars are allowed. However, the expansion of the charging infrastructure remains a key challenge for the widespread adoption of EVs. For electricity, governments could require electrical grid operators to install a minimum capacity of battery storage.

Lithium-ion batteries have indeed become the critical pillar for building a fossil fuel-free economy. The batteries can safely store energy for mobile and stationary use and ensure stable and uninterrupted flows of energy even when solar or wind power is used. Governments and the international community are required to help advance more powerful and affordable lithium-ion batteries, as well as promote their use.

Source: United Nations Department of Economics and Social Affairs

(a) Using a relevant elasticity concept, explain the relationship between the price of lithium-ion batteries and demand for sodium-ion batteries. [2]

(b) Explain how the trend of lithium prices in Figure 1 would have impacted the total revenue of lithium-ion battery producers. [4]

(c) Explain whether the invention of sodium-ion batteries would increase the profit level of battery maker CATL. [4]

(d) Explain why it may be worthwhile for multinationals to make moves into Indonesia (Extract 2) when Indonesia banned exports of nickel ore. [2]

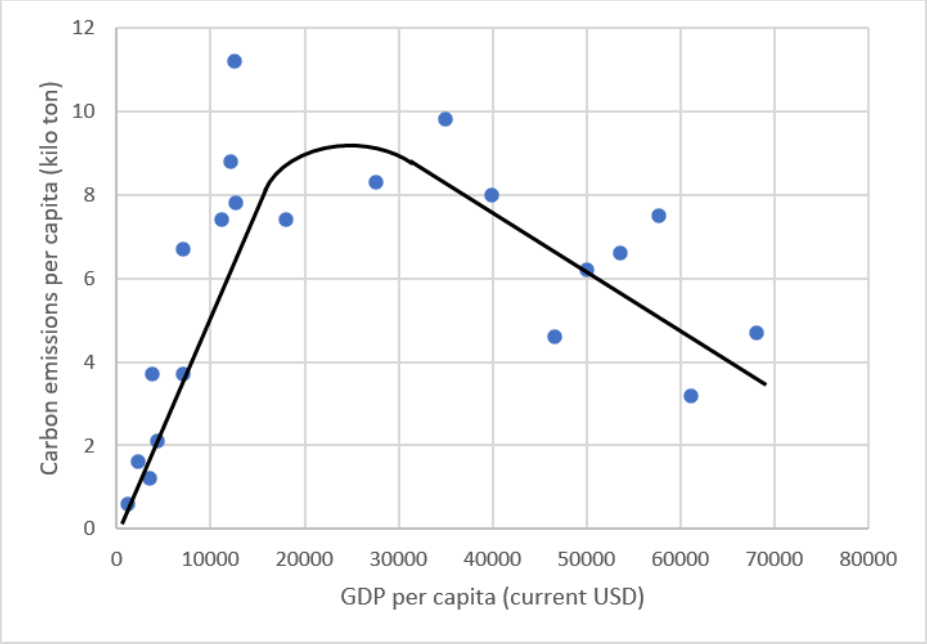
(e) With reference to the data, discuss whether Indonesia's mineral exports ban is likely to improve the living standards of its citizens. [8]

(f) In view of the need to reduce greenhouse gas emissions, discuss whether market-based or non-market-based instruments will be more effective in changing consumption patterns to improve societal welfare. [10]

[Total: 30]

Question 2: Global events and the economy of the United States (US)

Figure 2: Carbon emissions per capita and Gross Domestic Product (GDP) per capita of selected countries in 2021



Source: World Bank

Extract 5: Labour shortage in the US

President Biden's team has vowed that its massive stimulus package will recover all the remaining jobs lost during the pandemic in about a year, but that promise won't be kept unless there's a big pickup in hiring soon. There are still 8.2 million jobs left to recover. At the same time, business leaders are complaining that there is a "worker shortage," and they largely blame the more generous unemployment payments and stimulus checks for making people less likely to take low-paying fast food and retail jobs again. Some economists counter that companies could raise pay if they really wanted workers back quickly.

"Clearly, there are industries in both manufacturing and services that are eager to beef up staff as the pace of economic activity accelerates. But those efforts are being frustrated. In some cases, the problem is a mismatch in skills. You can't train a one-time courier on a bike to become an IT specialist overnight," said Bernard Baumohl, chief global economist at the Economic Outlook Group.

Source: The Washington Post, 7 May 2021

Extract 6: 136 countries have agreed to a global minimum tax rate

A global deal to ensure big companies pay a minimum corporate tax rate of 15% and make it harder for them to avoid taxation has been agreed by 136 countries, the Organisation for Economic Cooperation and Development (OECD) said on Friday. The OECD said four countries - Kenya, Nigeria, Pakistan and Sri Lanka - had not yet joined the agreement, but that the countries behind the accord together accounted for over 90% of the global economy.

Traditionally, companies avoid paying higher corporate tax by shifting production to low tax countries. The global minimum tax rate and other provisions aim to put an end to decades of tax competition between governments to attract foreign investment.

The OECD, which has steered the negotiations, estimates the minimum tax will generate $150 billion in additional global tax revenues annually. Economists expect that this global minimum tax rate deal will encourage multinationals to repatriate capital to their country of headquarters, giving a boost to those economies. However, various deductions and exceptions added into the deal are at the same time designed to limit the impact on low tax countries like Ireland, where many US groups base their European operations.

Source: Weforum.org, 1 Nov 2021

Extract 7: US companies are bearing the brunt of Trump's China tariffs

American businesses are bearing most of the cost burden from the elevated tariffs imposed at the height of the US-China trade war, said Moody's Investors Service.

The ratings agency said in a Monday report that US importers absorbed more than 90% of additional costs resulting from the 20% US tariff on Chinese goods. "If the tariffs remain in place, pressure on US retailers will likely rise, leading to a greater pass-through to consumer prices," the agency added.

But US importers are not the only one bearing the brunt of the elevated tariffs. Moody's said in the report that US exporters also absorbed most of the costs from tariffs imposed by China. That's partly because the US exports targeted by those retaliatory tariffs are products that may be sourced from other places, such as agricultural goods.

Economists and businesses had argued that Trump's tariffs on China harm the US economy, while failing to force China to reverse its unfair trade practices. President Joe Biden previously said he disagreed with Trump's approach to China, but is not in a hurry to reverse his predecessor's policies. His administration had suggested that it's open to using tariffs to fight China's unfair trade practices.

Source: CNBC, 18 May 2021

Extract 8: A sustainable, inclusive and growing future for the US

Even before the onset of the COVID-19 (coronavirus) pandemic, significant strains in the US growth model were apparent. Productivity growth, which drives overall economic growth and prosperity, and

the investment that fuels it, have slowed. Government spending on education, infrastructure, and scientific research fell from approximately 2.5% of GDP in 1980 to less than 1.5% of GDP today. The pandemic has exacerbated the investment slowdown.

Over the past decade, 25 US megacities and high-growth hubs generated more than two-thirds of the nation's job growth. By contrast, 54 trailing cities and roughly 2,000 rural counties that are home to one-quarter of the US population have had higher unemployment and lower educational attainment. The pandemic had a regressive effect on women in the workplace: the rate of women participating in the US labor force dropped from more than 57.7% in December 2019 to below 56% in September 2021—its lowest level in three decades. Furthermore, nearly half of African American US workers are concentrated in healthcare, retail, and accommodation, with the vast majority of those workers in lower-wage service roles.

However, its economy is showing strong signs of recovery from the COVID-19 pandemic. The US is also at the forefront of advanced technologies, from biotechnology to AI, with contributions from companies, universities, and government agencies. These technologies could be critical new sources of growth and potentially help further inclusion within the US. Innovation is not just taking place in laboratories: the COVID-19 crisis accelerated the adoption of new technologies. Going forward, it will be important to harness the economic dynamism that already exists in minority communities. Technological adoption spurred by the pandemic offers new solutions—not just hybrid work but also digital finance and large-scale retraining programs.

Source: Mckinsey.com, 8 Nov 2021

Extract 9: US economy grew 5.7 % in 2021

The US economy grew by 5.7% in 2021, the fastest full-year clip since 1984. In a powerful rebound from 2020, when the economy contracted by 3.4%, 2021′s strong growth created a record 6.4 million jobs. But it also brought a host of complications, helping fuel the highest inflation in 40 years and creating supply chain snarls as consumers hungry for products overwhelmed the global delivery system. To beat back rising prices, the Federal Reserve is now shifting its strategy and preparing for interest rate hikes this year, convinced it has given enough support to help the labor market and now must keep the economy from overheating further.

Earlier in 2021, economists worried that global supply chain problems would keep businesses from being able to fully stock shelves. But a rush by companies in the final months of 2021 to bolster their inventories ultimately drove gross domestic product much higher.

But the 2022 economy will have much less support behind it, as the Fed raises interest rates and Congress appears to have little appetite for more COVID-related stimulus via fiscal and monetary support. The hope is that households and consumers will be secure enough to keep the economy pumping, even as the pandemic dictates so much about the path ahead.

Source: The Washington Post, 27 Jan 2022

(a) **(i)** With reference to Figure 2, describe the relationship between carbon emissions per capita and GDP per capita. [2]

(ii) Explain **one** possible reason for the above relationship. [2]

(b) Using the evidence in Extract 5, explain why the US unemployment rate may not fall even with the government's massive stimulus package. [4]

(c) Explain how the imposition of a global minimum tax rate will affect the aggregate demand and aggregate supply of a low tax country like Ireland. [4]

(d) Discuss whether the US's imposition of tariffs on Chinese goods will benefit US households and firms. [8]

(e) With reference to the data, discuss whether fiscal policy is a better choice than supply-side policy in helping the US to achieve inclusive growth while recovering from the COVID-19 pandemic. [10]

[Total: 30]