CATHOLIC JUNIOR COLLEGE

JC2 Preliminary Examination

Higher 2

ECONOMICS 9570/01

Paper 1 **24 August 2023**

No Additional Materials are required. **2 hours 30 minutes**

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.

This document consists of **8** printed pages.

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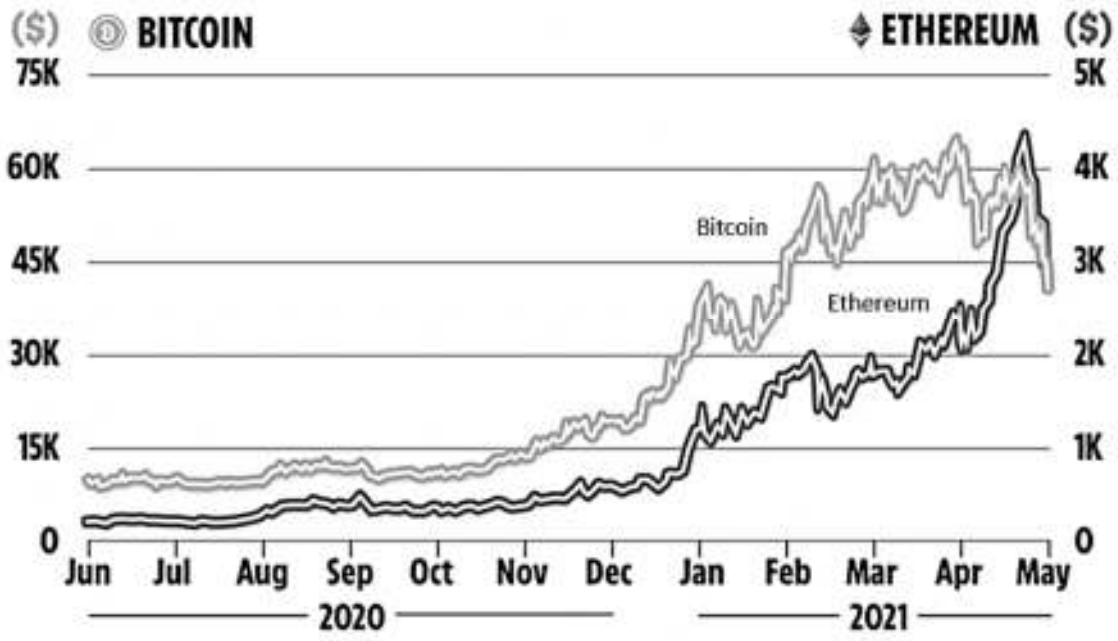
Question 1: The Cryptocurrency Revolution

Figure 1: Cryptocurrency Prices ($US)



Source: *CoinMarketCap*, assessed 12 July 2023

Extract 1: The Rise of Bitcoin

A cryptocurrency is a digital currency which serves as an alternative form of payment created using encryption algorithms. Bitcoin and Etherum are the two largest cryptocurrencies. Bitcoin ushered in the age of cryptocurrency, but it took quite a while before the public sat up and took notice. It was created by a mysterious individual with the promise of moving monetary policy out of the hands of governments and central banks into an autonomously managed system. Bitcoin achieved a remarkable rise in 2020 despite many things that would normally make investors wary, including US-China tensions, Brexit and, of course, an international pandemic.

Besides all this mainstream enthusiasm, the havoc brought by COVID-19 has led to huge stimulus packages from governments around the globe and many central banks printing more money. This drove up inflation fears and the possibility of eroding purchasing power. In the face of this threat, investments like Bitcoin are being considered a store of value. The price of Bitcoin is notoriously driven by sentiments and is highly volatile. Despite its volatility, part of what makes Bitcoin valuable is the fact that it is scarce. The maximum supply of Bitcoin is limited to 21 million and there are already about 18.5 million in circulation. The production of additional coins through crypto mining, which is increasingly complex, will incur significant costs where more computers with higher processing power are needed to get Bitcoin today. Given these dynamics, speculators have rushed into the space to take advantage of the anticipated price appreciation.

Source: *Various*

Extract 2: Singapore has grand ambitions to become a global crypto hub

Singapore is seeking to attract global investments and cement itself as a key player for cryptocurrency-related businesses as financial centers around the world grapple with approaches to handle one of the fastest growing areas of finance. According to the Infocomm Media Development Authority's Future of Services report, the blockchain market in Singapore has the potential to achieve a market spending of up to US$272 million in 2022 and up to US$2.6 billion by 2030 with a compound annual growth rate of 32.5%. "We think the best approach is not to clamp down or ban these things," said Ravi Menon, managing director of the Monetary Authority of Singapore (MAS), which regulates banks and financial firms. Instead, MAS is putting in place "strong regulations", so firms that meet its requirements of addressing the various risks involved, are allowed to operate, he said.

The highly volatile nature of cryptocurrency presents various challenges to our economy - ranging from displaced workers to declined confidence in our financial system. "With crypto-based activities, it is basically an investment in a prospective future, the shape of which is not clear at this point," said Menon. "But not to get into this game, I think risks Singapore being left behind. Getting early into that game means we can have a head start, and better understand its potential benefits as well as its risks."

Source: Adapted from *The Business Times*, 2 Nov 2021

Extract 3: Environmental impacts of crypto mining in the United States

The amount of crypto mining operations has increased exponentially in the United States since 2020. Its explosive growth, which required an intensive and often volatile power consumption, has created a series of negative spillover effects. This includes increased risks for local electrical grids —straining equipment, causing service interruptions and safety hazards, increased total carbon emissions and local air pollution. Crypto mining activities can also push up retail electricity prices, and the economic impact falls disproportionately on low-income households.

As long as the reward is high enough (i.e., the price of Bitcoin is high enough), miners will be incentivised to ramp up operations as quickly as possible, with little concern about the source of energy. Big mining operations have shown an inclination to invest in inefficient power sources, like defunct coal plants or low-capacity gas plants, as long as electricity can be made available quickly.

Unlike other large electricity users, cryptocurrency mining operations have a short time horizon, and most crypto players have shown little interest in investing in new clean energy. As more mining machines enter the race, the difficulty of the computational problem will increase, and the electricity required to win increases. Over time, electricity usage by miners will climb to an extraordinary level. This will pose environmental and economic concerns that may be difficult to remedy in future.

Source: *Various*

Extract 4: China's top regulators ban crypto trading and mining

To date, crypto mining does not generate the local and national economic benefits typically associated with businesses using similar amounts of electricity. Instead, the energy is used to generate digital assets whose broader social benefits have yet to materialize. China banned such activities completely in 2021. Many countries are also increasingly starting to restrict crypto mining. However, the potential for crypto mining to relocate abroad—such as to areas with dirtier energy production—is a concern.

The move to ban crypto mining in China is beyond just environmental concerns. Another concern would be that privately operated highly volatile digital currencies could undermine their control of the financial and monetary systems, increase systemic risk, promote financial crime, and hurt investors. Analysts say China also sees cryptocurrencies as a threat to its sovereign digital Yuan, which is at an advanced pilot stage. However, the Chinese government has struggled in the past to stop internet users from evading its controls.

China's most powerful regulators intensified a crackdown on cryptocurrencies with a blanket ban on all crypto transactions and mining, hitting Bitcoin and other major coins and pressuring crypto and blockchain-related stocks to root out these unregulated and illegal cryptocurrency activity. To ensure that crypto mining is not simply pushed from one local community to another, perhaps a tax could be considered, by having crypto miners pay their fair share of the costs imposed on local communities and the environment.

Source: Adapted from *Reuters*, 25 Sep 2021

Questions

(a) With reference to Figure 1, compare the price of Bitcoin prices with that of Ethereum from June 2020 to May 2021. [2]

(b) Using a diagram and Extract 1, explain the volatile nature of Bitcoin prices. [4]

(c) Explain any <u>one</u> function of the price mechanism in the Bitcoin market. [2]

(d) With the help of a diagram and evidence in Extract 3, explain how crypto mining activities can affect consumer surplus in the retail market. [4]

(e) Discuss whether the Singapore economy will stand to gain or lose from being a global crypto hub. [8]

(f) Using Extract 4, discuss whether the ban by the Chinese government is the best policy in managing the costs of crypto mining activities imposed on local communities and the environment. [10]

[Total: 30]

Question 2: Covid-19 and the Challenge of Economic Recovery in Singapore

Figure 3: Singapore's international visitor arrivals and tourism receipts

Year	International visitor arrivals	Tourism receipts ($)
2023	12 million to 14 million*	$18 billion to $21 billion*
2022	6.3 million	$13.8 billion to $14.3 billion**
2021	330,000	$1.9 billion
2020	2.7 million	$4.8 billion
2019	19.1 million	$27.7 billion

NOTE: *Projected figures **Preliminary estimates for the full year

Source: The Straits Times 2022

Extract 5: Covid-19's impact to still weigh on Singapore's economy

The Covid-19 pandemic has plunged Singapore into a highly unbalanced recession, despite a few sectors such as e-commerce, technology-intensive and biomedical sectors flourishing due to changes in consumer behaviour and rising digitalisation. The brunt of the recession has mainly been borne by labour-intensive services thus far, such as aviation and tourism-related industries.

With up to a third of the workforce being vulnerable to reduced income or layoffs due to the crisis, the Monetary Authority of Singapore (MAS) flagged the likelihood of firms and households holding back on investment and discretionary spending because of income losses and increased uncertainty. The MAS also expressed concern that an unbalanced recession tends to be deeper and longer and leave an especially large imprint on the labour market, likely because of skill mismatches and sector-specific human capital. This has been the case in Singapore, where job losses so far have been in aviation, hospitality and the food and beverage industry, whereas many of the vacancies are in technology, healthcare and finance.

The country's workers in manual jobs which typically pay lower salaries, face a more challenging reality during the pandemic. At the opening of Parliament, Minister Masagos Zulkifli said "The crisis will not divert us from our efforts to improve social mobility, and we will ensure that no Singaporean is left behind,". The government has introduced the Job Support Scheme, to support businesses in retaining their employees, as well as various social transfer schemes to help households with their expenses.

Source: Channel News Asia 2021 & The Straits Times 2021

Extract 6: China's economy in trouble

China has chosen health over the economy by enacting severe lockdowns and border closures to maintain a close to zero Covid-19 infection rate. However, the country's economy has suffered. From a slowdown in industrial production to plunging import and export levels, investors are assessing warning signs that Beijing is struggling to restart growth. These restrictions have led to foreign companies with supply chains in China, to invest in alternative sources such as Vietnam, to reduce disruption to their operations.

According to China's own data, the economy has been experiencing headwinds. For a long time, China has tried to build a consumption-driven economy. But economic data suggests China has yet to see a meaningful recovery in real household income growth since the start of the pandemic. This is now exacerbated by local lockdowns because people cannot physically leave their houses to make purchases, and the latest retails sales data shows that even online sales have been hit hard by supply chain and logistical disruptions.

The Chinese Yuan plunged after activity in the country's services industry fell more than expected. This was yet another signal for investors that growth has started to flounder. The People's Bank of China issued a statement saying that they would implement necessary monetary tools to shield the currency from "panic" selling, sparking concerns about greater inflationary pressures.

China's domestic troubles are also threatening the global economy on two fronts. First, weaker Chinese demand harms industries across the world, in sectors ranging from essential commodities that serve as important factors of production, to luxury products. Second, the zero-Covid policy is creating a supply chain crisis. China accounts for almost a third of global manufacturing output. When a Chinese factory or port is closed, businesses and consumers across the world feel the effects.

Source: Business Insider 2022 & The Guardian 2022

Figure 4: Singapore' trade performance with major trading partners, 2022

Rank	Singapore exports by country	Value (S$ Billion)		Singapore imports by country	Value (S$ Billion)
1.	China	63.97		China	62.98
2.	Hong Kong	57.78		Malaysia	59.40
3.	Malaysia	51.59		United States	51.58
4.	United States	45.31		South Korea	30.63
5.	India	37.23		Japan	26.72

Source: Trading Economics 2022

Extract 7: MAS tightens monetary policy in response to global economic outlook

The MAS surprised experts by tightening its monetary policy, strengthening the Singapore dollar in response to rising inflation and the economic recovery that it expects in the coming years. MAS described how the global and domestic economic outlook has changed, giving two primary reasons: rising core inflation and future economic growth.

Some factors that the MAS gave for rising inflation include:

- Rising costs of imports, which are likely to persist for some time due to strengthening global demand and lingering supply constraints.
- Various service fee increases that had been put on hold due to the pandemic, such as those for transport, healthcare and education, could resume.
- Gas and electricity prices around the world have risen to their highest levels in decades, driven by a strong rebound in energy demand as countries recover from the pandemic.

Singapore's economy is expected to recover in line with its gradual domestic reopening, due to the effectiveness of vaccines in limiting the spread of Covid-19 and rising inoculation rates.

Source: Today Online 2021

Extract 8: Singapore's plans to thrive in a post-pandemic world

Despite economic disruptions caused by the pandemic, Singapore has strengths in many of the core industries that may benefit from tailwinds in the post-pandemic era, such as semiconductors, oil trading and refinery, biomedical as well as financial services. It has been able to attract significant foreign investment commitments, even during the pandemic - about $14.3 billion in the first half of last year, compared with $15.2 billion for the whole of 2019.

Notably, several vaccine manufacturing firms are currently constructing production facilities in Singapore, including BioNTech and Sanofi. "Having multiple nodes in our production network is an important step in building our global capabilities. With this planned mRNA vaccine production facility, we will increase our overall network capacity and tap on the potential of the East Asian market for pharmaceuticals," said Ugur Sahin, the Co-founder of BioNTech. The facilities will be powered by data analytics and artificial intelligence to enhance production processes, and will cement Singapore as a leading biotechnology and pharmaceutical producer.

However, the government has cautioned that the rise of digitalisation and automation will eventually phase out manual processes, so professionals must evolve in other value-added responsibilities or acquire digitalisation-related skills to remain relevant. As digital transformation takes center stage in the economy, businesses must evolve rapidly to keep up with disruptions. The government has also committed to addressing the concerns over the widening rich-poor divide and declining social mobility.

Source: The Straits Times 2022

Questions

(a) **(i)** With reference to Figure 3, state the relationship between international visitor arrival and tourism receipts. [1]

(ii) Using Figure 3, explain the impact of the change in tourism receipts between 2020 and 2023 on Singapore's economic performance. [3]

(b) Using the marginalist principle, explain **two** factors vaccine manufacturing firms such as BioNTech may consider when deciding whether to set up a production facility in Singapore. [4]

(c) Explain **two** reasons why the MAS opted to strengthen the Singapore dollar as opposed to interest rate manipulation in its conduct of monetary policy. [4]

(d) Discuss the relative importance of domestic and global factors in accounting for Singapore's recession. [8]

(e) Discuss whether the pursuit of digital transformation is the most appropriate policy for Singapore to sustain its growth and minimise income inequality. [10]

[Total: 30]

END OF PAPER

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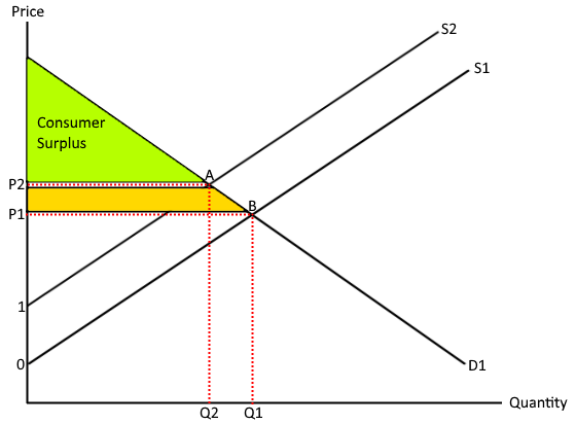
Suggested Answers and Mark Scheme for CSQ1

(a)	**With reference to Figure 1, compare the price of Bitcoin with that of ether from June 2020 to May 2021.**	**[2]**
	• *Both generally rising trend. [1]* • *Bitcoin price is increasing at a faster rate OR Bitcoin price is always higher than ether. [1]*	
(b)	**Using a diagram and Extract 1, explain the volatile nature of Bitcoin prices.**	**[4]**
	• *Change in Demand and Factor: Expectations of future increase in Price → capital gains from investment → increase in current speculative demand [1]* • *Price inelastic supply ('the production of additional coins will take significant cost as the average computer can no longer handle the intense processing power needed to get bitcoin today') OR perfectly inelastic supply ('maximum number of Bitcoin that will ever exist is set at 21 million ') [1]* • *Price adjustment process mechanism [1]* • *Diagram + Reference → Large increase in price → large extent of change in price given the change in supply → volatility in Bitcoin prices from the sharp changes in price movements [1]* *Note:* • *Either prove large price increase or decrease is sufficient* • *Alternative: If anticipate price to fall → fall in demand & PES<1 → large fall in price*	
(c)	**Explain any <u>one</u> function of the price mechanism in the Bitcoin market.**	**[2]**
	• *Signalling function – the price level acts as a signal to producers about consumer preferences, an increase in the price of bitcoin, driven by speculative demand, will encourage producers to mine and increase quantity supplied of bitcoin [1] as they find it profitable to increase output [1]* *or* • *Incentive function – if there is an increase in the demand for bitcoin then producers find that they can sell more at the original price [1], thus they mine and increase quantity supplied in the market because it is more profitable to do so [1]* *or* • *Rationing function – given the scarcity of bitcoin (supply is limited / perfectly price inelastic), the price of bitcoin increases when there is a shortage (excess demand) [1]. The increased price will price out some consumers and disincentivise them to make the purchase, thus rationing the limited quantity of bitcoin accordingly [1]*	
(d)	**With the help of a diagram and evidence in Extract 3, explain how crypto mining activities can affect consumer surplus in the retail market.**	**[4]**
	• Evidence + Inference/link to determinant- Extract 3 "Crypto mining activities can also push up retail electricity prices", thus increasing input costs. [1]	

	• There is an increase in cost of production since electricity cost is part of the production cost in various retail markets, resulting in a fall in supply. [1] • Decrease in supply causes a rise in price and a fall in quantity, resulting in a fall in consumer surplus. [1] • Diagram with reference on change in consumer surplus area. [1]  	
(e)	**Using Extract 3, discuss whether the Singapore economy will stand to gain or lose from being a global crypto hub.**	**[8]**
	Thesis: Singapore may stand to gain • *Extract 3: 'the blockchain market in Singapore has the potential to achieve a market spending of up to US$272 million in 2022 and up to US$2.6 billion by 2030 with a compound annual growth rate of 32.5%.' → Potential increase in investment in blockchain industry & infrastructure and human capital development by the government → increase in I and G → increase in AD and multiplied increase in RNY (AEG)* • *In addition, increase in QQT in the blockchain industry will lead to expansion of productive capacity → LRAS shifts right (PEG)* • *Thus, sustained EG is achieved + increased employment of labour.* • *For H2: Cryptocurrency trading will receive influx of portfolio investments → inflows of foreign capital will worsen the Capital & Financial Account → but improve the BOP, ceteris paribus.* ***Anti thesis: Singapore may stand to lose*** • *Extract 3: 'ranging from displaced workers to decline in confidence ratings of our financial system.' → structural unemployment might occur as workers in the traditional finance system will be unemployed due to the fall in demand of their services as more investors pivot to cryptocurrency → skills mismatch and occupational immobility will entrench workers to long term unemployment.* • *In addition, the highly volatile nature of cryptocurrency trading might lead to fall in investors' confidence in the economic stability → negatively affect I as AD and LRAS falls → recession and demand-deficient unemployment ensue.* ***Evaluation Conclusion: Weigh then recommend***	

- ***Possible short-term costs are minor***
  - *Resultant effect of the increase in AD depends on state of economy → overheating as demand-pull inflation will be expected if lack of spare capacity → only a short run problem*
  - *Surge in inflows of portfolio investments will increase demand of SGD in Forex market, leading to appreciation of SGD → SG will lose export price competitiveness → unlikely as MAS can intervene to weaken the SGD if it crosses the acceptable range*
- ***Long term costs can be mitigated by government policies***
  - *Structural unemployment risk can be mitigated by use of stringent measures by the government to regulate the industry to ensure business confidence; SSP like SkillsFuture to reduce the occupational immobility and as displaced workers relearn new skills to transit into new employment opportunities in sunrise sectors.*
- ***With government regulation and policies in the market for cryptocurrencies, it is likely that there is a net benefit to Singapore.***

Mark Scheme

Knowledge, Understanding, Interpretation, Application and Analysis		
Level	**Descriptors**	**Marks**
L2	Responses in this level will provide detailed two-sided analysis on the macroeconomic benefits and costs to Singapore, showing excellent ability to describe and explain relevant economic concepts, theories, and principles in a precise, logical, and reasoned manner, with good use of extract evidence.	4-6
L1	Responses in this level will be one-sided or have some limited understanding of the macroeconomic benefits and/or costs to Singapore. There may be some basic content errors and limited or no application of economic concepts, theories, and principles to the context at hand.	1-3

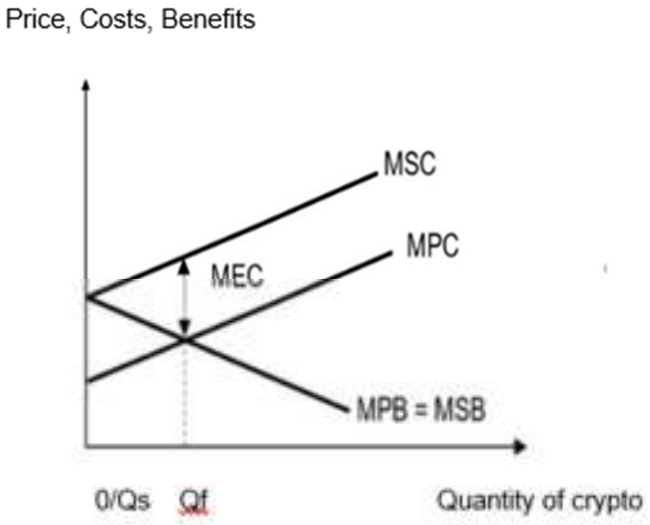
Evaluation

Level	**Descriptors**	**Marks**
E2	One explained evaluative statement + One recommendation. 2rd EV mark can only be given when recommendation is supported using earlier evaluation.	2
E1	One explained evaluative statement. No marks for listing down of irrelevant evaluative points.	1

(f)	**Using Extract 4, discuss whether the ban by the Chinese government is the best policy in managing the costs crypto mining activities have imposed on local communities and the environment.**	**[10]**

Policy 1: Mechanism of Ban

- A total ban is an outright restriction of output where the quantity produced will now be 0. This eliminates all external costs, because zero units of the good is produced. Ideally, the government should ban the product only **if the socially optimal output Qs is at zero** and the MSC is greater than MSB **for all output levels**.
- The negative externality is so large that MSC exceeds MSB at all output levels, i.e. the socially efficient amount of guns to be consumed is zero. It is more optimal to ban the good, as any non-zero output of cryptocurrency would result in an inefficient resource allocation for society.
- *Improve societal welfare (allocative efficiency) when MSC > MSB at all output levels.*
- *Evidence in Extract 3 suggests that MSC seems to be always higher than MSB <u>for now</u> → To date, crypto mining does not generate the local and national economic benefits typically associated with businesses using similar amounts of electricity. Instead, the energy is used to generate digital assets whose broader social benefits have yet to materialize → Qs = 0 → Ban results in Qf reduce to Qs = 0 → eliminated DWL*

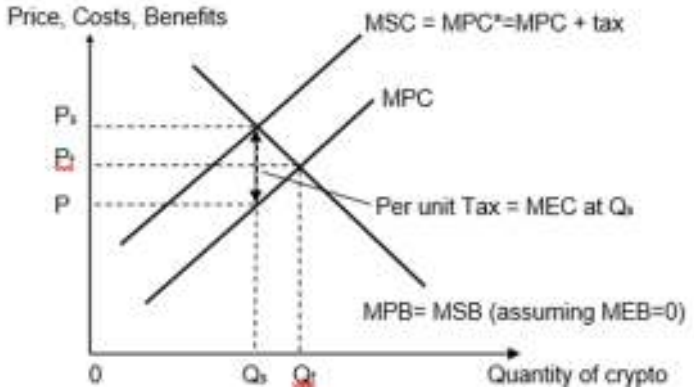


Limitations of ban as a policy (1 well developed)

- *<u>In future</u> → ban not effective → MSC not always higher than MSB such that Qs is not 0 → Ban results in overcorrection → eliminate DWL from market failure but create DWL due to government policy failure.*
- *In addition, the economic benefits of crypto trading / mining will be forgone given the ban.*
- *Emission seepage as mining activities relocate overseas (as mentioned in Extract, relocation of mining activities, 'such as to areas with dirtier energy production') which will still contribute to global warming given the transboundary nature of carbon emission from increased energy usage.*

Policy 2: Mechanism of Tax

- *Tax to be levied to crypto miners → tax amount to internalise the MEC so Qs is achieved. A tax equal to the marginal external cost imposed by the government. The tax makes the crypto miners internalise the negative externality in their decision making as the miners' new MPC shifts up to MPC*. The equilibrium price was initially at P_f but increases to P_s because of the tax. The increase in price would reduce the quantity demanded, reducing the equilibrium quantity towards Qs. As a result, miners will reduce production to Q_s where the new MPC = MPC*=MPB, to maximise their net benefit.*
- *The socially efficient output level Q_S is achieved, and the deadweight loss is eliminated.*
- *Evidence in Extract 3 suggests a tax to ensure that cryptomining is not simply pushed from one local community to another, by having cryptominers pay their fair share of the costs imposed on local communities and the environment.*



Limitations of tax as a policy (1 well developed)

- *Imperfect info on the value of MEC for accurate administering of tax amount to achieve Qs*
- *Under-developed tax infrastructure in China to monitor and enforce the tax, as evidenced 'Chinese government has struggled in the past to stop internet users from evading its controls.'*

Note: other accepted policies → legislation on bitcoin mining activities

Overall Synthesis

Stand + Substantiation:

- *Taxing crypto mining activities allows for additional benefits which a total ban does not offer, such as revenue generation, while at the same time disincentivise market undesirable behaviour which would reduce the negative impacts on local communities and environment.*
- *Taxing crypto mining activities instead of banning it also allow government to harness its potential macroeconomic benefits as a future engine of growth. Banning it would stifle investments and innovation, constraining economic growth.*

Recommendation:

- *Hence, government should tax rather than ban crypto mining activities, and increase its role as a regulator in this market to curb undesirable behaviour.*

Mark Scheme

Knowledge, Understanding, Interpretation, Application and Analysis		
Level	**Descriptors**	**Marks**
L2	Responses in this level will provide detailed analysis on policy 1 (mechanism of ban) and policy 2 (mechanism of another policy) in the context of China and the market failure due to over-production, showing excellent ability to describe and explain relevant economic concepts, theories, and principles in a precise, logical and reasoned manner, with good use of extract evidence.	4-7
L1	Responses in this level will have some limited understanding of policy 1 (mechanism of ban) and policy 2 (mechanism of another policy). There may be some basic content errors and limited or no application of economic concepts, theories and principles to the context of China.	1-3

Evaluation

Level	**Descriptors**	**Marks**
E3	One explained evaluative statement + One recommendation. 3rd EV mark can only be given when recommendation is supported using earlier evaluation	3
E2	One explained evaluative statement OR Two weakly supported evaluative statements. Comparison of strengths and/or limitation of the two policies considered well explained.	2
E1	One evaluative statement that may be poorly substantiated or not supported by the arguments presented in the answer.	1

[Total: 30]

Suggested Answers and Mark Scheme for CSQ2

(a)	**(i)**	**With reference to Figure 3, state the relationship between international visitor arrival and tourism receipts.**	**[1]**
		• There is a positive / direct relationship between international visitor arrival and tourism receipts. [1] DO NOT ACCEPT: When international visitor arrival increases, tourism receipts increase.	
	(ii)	**Using Figure 3, explain the impact of the change in tourism receipts between 2020 and 2023 on Singapore's economic performance.**	**[3]**
		• Figure 3 shows an increase in tourism receipts between 2020 and 2023, it will contribute to a rise in Singapore's export revenue (X). A rise in export revenues, will increase net exports (X-M), leading to an increase in aggregate demand (AD). [1] **Any two of the following impacts on macroeconomic aims:** • An increase in AD may lead to a multiplied rise in real national income via the multiplier process, which would result in actual economic growth. [1] • An increase in AD may lead to a shortage of goods at the initial general price level, there will be an upward pressure on general price levels, leading to demand-pull inflation.[1] • An increase in AD would lead to an increase in production of goods and services in the economy and increase derived demand of labour, resulting in a fall in the unemployment rate. [1] • The improved trade balance due to changes in tourism receipts will then lead to an improvement in the current account, which will lead to an improvement in the balance of payment of the economy. [1]	
(b)		**Using the marginalist principle, explain two factors vaccine manufacturing firms such as BioNTech may consider when deciding whether to set up a production facility in Singapore.**	**[4]**
		Marginal Benefit, Definition + Explanation with contextualised example: • Marginal Benefit is the benefit that results from carrying out one additional unit of production. [1] • For example, BioNTech will enjoy extra revenue earned from investing in SG by being able to have access to the East Asian market (Extract 8) by building an additional production facility in Singapore. [1]	

		Marginal Cost, Definition + Explanation with contextualised example: • Marginal Cost is the costs that results from carrying out one additional unit of production. [1] • For example, prices of gas and electricity are soaring around the world (Extract 7) and BioNTech will consume more such factors of production. As such, they will experience additional costs by building an additional production facility in Singapore. [1] The vaccine manufacturing firms will decide to set up production facilities in Singapore if the marginal benefit of doing so outweighs the marginal cost.	
(c)		**Explain two reasons why the MAS opted to strengthen the Singapore dollar as opposed to interest rate manipulation in its conduct of monetary policy.**	**[4]**
		Singapore is a small and open economy, the choice of exchange rate as the instrument of monetary policy is due to the nature / characteristics of its economy. **Any two of the following, nature / characteristic of the Singapore Economy + Implication on conduct of monetary policy:** **Point 1** • Singapore is heavily dependent on trade and net exports (X-M) takes up a significant part of the economy's GDP *OR* has no natural resources and relies on imports to survive. [1] • It would be more significant to adopt exchange rate as an instrument to stimulate economic growth, as well as to shield the economy from imported inflation; as it directly impacts the quantity demanded for exports and imports through prices. [1] **Point 2** • Singapore is an interest-rate taker. [1] • If Singapore has interest rates that is relatively higher than those of other countries, there would be an inflow of hot money. This will increase domestic supply of money and cause interest rates to fall, making it unrealistic for MAS to influence the interest rates. [1] **Point 3** • Singapore is a financial hub with free capital mobility. [1] • When there is a fall interest rates, there will be an outflow of hot money. This will cause an increase in the supply / decrease in the demand of the Singapore dollar, which would lead to a depreciation – going against the MAS stance of gradual appreciation. [1]	

NOTE: Candidates may take an alternative approach by providing one reason for Singapore employing exchange-rate policy (i.e. point 1) and one reason for Singapore not employing interest-rate policy (i.e. point 2).

(d) **Discuss the relative importance of domestic and global factors in accounting for Singapore's recession.** **[8]**

Question Analysis

Command	Discuss – two-sided answer with a well-reasoned conclusion
Content	Factors affecting economic growth (i.e. aggregate demand and aggregate supply)
Context	Singapore, recession (i.e. negative economic growth).
Approach	
Thesis	**Anti-thesis**
Domestic factors (e.g. C, Domestic I) are more important to account for Singapore's recession	Global factors (e.g. X, FDI) are more important to account for Singapore's recession
Evaluation	
However, domestic factors and/or global factors may only account for Singapore's recession to a limited extent	

Suggested Answer

Thesis: Domestic factors are more important to account for Singapore's recession

Extract 5 mentioned that Monetary Authority of Singapore (MAS) flagged the likelihood of domestic firms and households holding back on investment and discretionary spending because of income losses and increased uncertainty.

With the fall in income coupled with the lowering of expectation of future income and employment, there will be a fall in Consumption (C). Thus leading to a fall in AD.

In a recession, businessmen are pessimistic about the future. Their expected rate of return on the investment falls. Thus, the MEI curve shifts leftward from MEI0 to MEI1 (Figure 1). This causes the level of investment to fall from I0 to I1 at the interest rate of r0. Thus there will be a fall in Investment (I). Thus leading to a fall in AD.

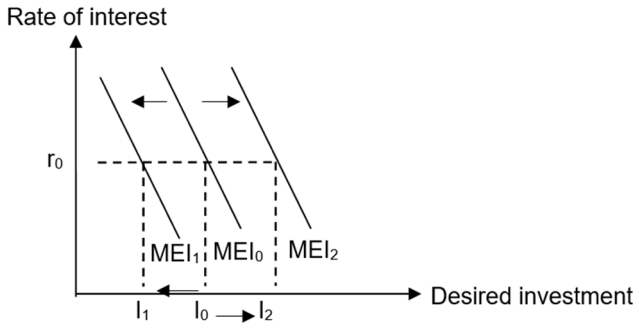


Figure 1: Fall in MEI

The MAS has also tightened its monetary policy by strengthening the Singapore dollar as seen in Extract 7. The appreciation will lead to exports being more expensive in foreign currency terms. This will lead to an fall in demand for our exports. Imports will be cheaper in local currency terms. This will lead to a rise in quantity demanded of the imports, thus leading to an increase in M and a fall in X. (X-M) will then fall, resulting in a decrease in AD, ceteris paribus.

In total, Singapore's AD will fall from AD_1 to AD_2 as seen in diagram. A fall in AD will result in a fall in Real National Income from Y1 to Y2. This will then lead to a fall in income induced consumption and thereafter, a further fall in AD. This triggers many successive rounds of decrease in national income and income induced consumption. At each round, the decrease in both gets smaller. The multiplier process will end when the decrease in national income is too small to generate further decreases in induced consumption. The autonomous fall in AD from AD1 to AD2 results in a multiplied decrease in RNY from Y1 to Y5, resulting in negative actual economic growth (Figure 2). As such, Singapore may experience a recession.

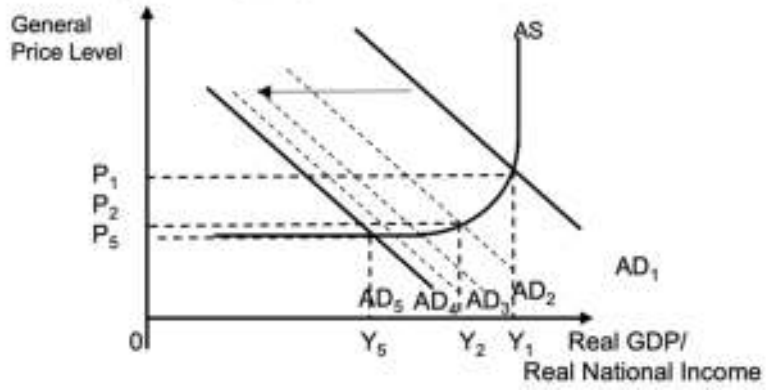


Figure 2: Fall in AD

Evaluation: However, domestic factors may only account for Singapore's recession to a limited extent

The extent of fall in C and I can be mitigated by Singapore government's support measures such as Jobs Support Scheme, COVID-19 Support Grant, SGUnited Jobs and Skills Package. Thus,

		the extent of fall in AD is reduced and thus minimising the impact on negative economic growth. As such, domestic factors may not be the key reason for Singapore falling into recession. **Anti-Thesis: Global factors are more important to account for Singapore's recession** The Chinese Yuan plunged as seen in Extract 6, this would mean that the Singapore dollars has appreciated against the Chinese Yuan. The appreciation will lead to exports being more expensive in foreign currency terms. This will lead to an fall in demand for our exports by China. Imports will be cheaper in local currency terms. This will lead to a rise in quantity demanded of the imports from China, thus leading to an increase in M and a fall in X. (X-M) will then fall, resulting in a decrease in AD, ceteris paribus. The uncertainty brought about by Covid may hinder Foreign Direct Investments into Singapore. Coupled with the poor economic performance of China, Chinese companies may reduce their FDIs into Singapore. In addition, will falling income in China, and reduced purchasing power of the Chinese consumers, they will import less and thus reduce Singapore's exports to China. This is made worst with the fact that China is Singapore's top export destination amounting to S$63.97 billion. A fall in AD will once again result in a fall in Real National Income from Y1 to Y5 through the multiplier process and hence negative actual economic growth. As such, Singapore's economic growth is impacted by China, and poor exports have led to Singapore falling into a recession. **Evaluation: However, global factors may only account for Singapore's falling economic growth to a limited extent** The composition of our domestic production may mitigate the extent of fall in X, as a large proportion of Singapore trade is Oil which is a highly price inelastic good. Thus even with an increase in price due to Exchange Rate changes, the fall quantity demanded will less than proportional and thus in fact the sales revenue may increase instead. As such, there may not be a fall in AD, resulting in limited or no fall in actual economic growth. **Summative Conclusion: Are domestic factors or global factors relatively more important to account for Singapore's recession?** **[Stand]** Given that Singapore is a small open economy, with (X-M) comprising a large component of GDP – more than three times the annual GDP. As such, the global factors are more important in explaining why Singapore fell into a recession.	

[Substantiation - Situation of STRAWS] With China playing a significant role as an export destination, the impact of Singapore's X is highly dependent on China and other export destinations.

[Something special - Recommendation of STRAWS] Singapore must continue to actively manage its exchange rates in relations to top trading partners to ensure that trade flows are not disrupted/impacted.

Mark Scheme

Knowledge, Understanding, Interpretation, Application and Analysis		
Level	**Descriptors**	**Marks**
L2	Balanced discussion, with well-developed explanation and use of economic analysis on how **both** domestic factor(s) **and** global factor(s) may lead to Singapore falling into recession. Answers must rely on extract evidence and discussion of factors must be **contextualised** to the Singapore economy.	4-6
L1	Changes in AD-AS factors are not linked to recession in Singapore or contain incomplete explanation. Answer could contain inaccurate use of economic analysis, or purely theoretical with limited use of extract evidence. A one-sided response that explains either domestic factor(s) **or** global factor(s) leading to a recession in Singapore, with use of extract evidence. – max 3m Responses with discussion of factor(s) that are **not explicitly identified** as global or domestic factors. – max 2m.	1-3

Evaluation

Level	**Descriptors**	**Marks**
E2	One **explained** evaluative statement + One recommendation. 2rd EV mark can only be given when recommendation is supported using earlier evaluation.	2
E1	One **explained** evaluative statement.	1

			No marks for listing down of irrelevant evaluative points. E.g. of explained evaluative statement: Singapore is highly dependent on trade, as such the (X-M) forms a large proportion of the economy's GDP. A large fall in X, would lead to a significant fall in AD and subsequently actual economic growth. Therefore, the fall in China's demand for Singapore export is the most important external factor in explaining Singapore's falling economic growth, leading to a recession.	
(e)		**Discuss whether the pursuit of digital transformation is the most appropriate policy for Singapore to sustain its growth and minimise income inequality.**		**[10]**
		Question Analysis **Command**: Discuss – two-sided answer with a well-reasoned conclusion **Content**: Policies to achieve sustained economic growth and minimise income inequality **Context**: Singapore **Approach** **Thesis**: Digital transformation (i.e. supply-side policy, which includes automation and digital skills upgrading) can sustain growth (i.e. both actual and potential) and minimize income inequality. **Anti-thesis 1**: Limitations of digital transformation to sustain growth and minimise income inequality. **Anti-thesis 2**: Alternative policy (e.g. Fiscal Policy) can sustain growth (i.e. both actual and potential) and minimize income inequality. Limitations of alternative policy to sustain growth and minimise income inequality. **Summative Conclusion** Is digital transformation the best policy to achieve sustained economic growth, while minimizing the extent of income inequality?		
		Suggested Answer **Thesis: Digital transformation can sustain growth and minimise income inequality.**		

The pursuit of digital transformation involves the move towards greater automation and less manual processes (Extract 8). In effect, the Singapore government is implemesnting supply side policies which focus on influencing the aggregate supply (AS) as digital transformation is likely to lower the unit cost of production, leading to an increase in SRAS. This is shown as a downward shift of the SRAS curve from SRAS0 to SRAS1 and real national income increases from Y0 to Y1, resulting in actual economic growth. (Figure 1)

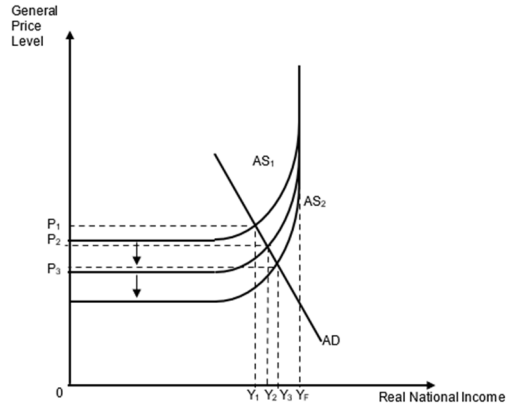


Figure 1: Increase in SRAS

In addition, greater automation resulting from digital transformation also increases the productive capacity of the Singapore economy and increases LRAS. While the reduction in costs and an increase in SRAS help to achieve actual economic growth, the increase in the productive capacity of the Singapore economy also enables it to achieve potential economic growth.

This is shown as a rightward shift of LRASo to LRAS1, and Yfo to Yf1. (Figure 2)

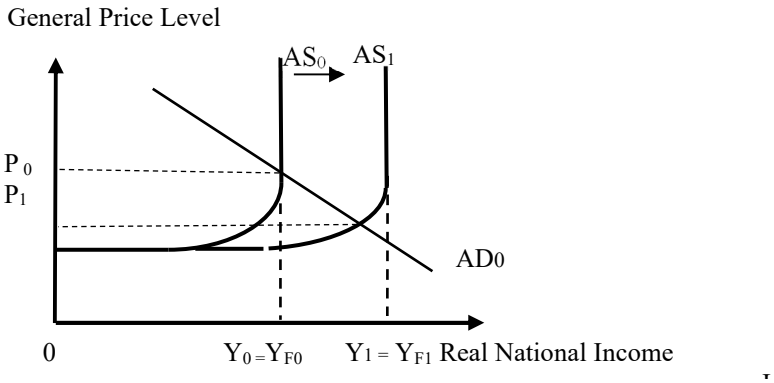


Figure 2: Increase in LRAS

Clearly, digital transformation is an effective policy to sustain economic growth since it can help Singapore to achieve both actual and potential growth.

		Through the adoption of technology, digital transformation may also complement labour which could help Singapore achieve sustained growth and inclusive growth. When workers are equipped with relevant digital skills and skills to handle automation, it increases workers' occupational mobility and are able to seek employment as the workers are equipped with the digital skills to transit into jobs in expanding industries. With digital transformation, workers inevitably gain in terms of receiving retraining and acquiring the relevant digital skillsets which enable them to earn an income, thereby, minimising inequality and **reducing the gini coefficient.** **Antithesis 1: Limitations of digital transformation to sustain growth and minimise income inequality.** Digital transformation may not necessarily minimise income inequity as it may result in structural unemployment, leading to groups of workers who may not have the required digital skills to join the expanding industries such as technology where there are vacancies that (Extract 5). In fact, the government has cautioned that the rise in digitalisation and automation will eventually phase out manual processes, and professionals must acquire digitalisation-related skills to remain relevant (Extract 8). It may take a long time for workers to be trained in digital skills, as they may first need to pick up several other pre-requisite skills such as numeracy and computing; which could make it more difficult for existing low-skilled workers to pick up. As such, they may be displaced by automation and be unable to seek new employment for an extended period of time due to the skills mismatch; they will experience a fall in real income and purchasing power. This may thereby, worsen the income-gap, worsening income inequality. **Antithesis 2: Expansionary Fiscal Policy to sustain growth and minimise income inequality.** Notwithstanding the above of how digital transformation could sustain growth and minimise income inequality, the Singapore government may increase government spending, G (which directly increases AD, given that G is a component of AD) and reduce taxation,T. By reducing the income tax, consumers' disposable income increases resulting in a rise in their purchasing power, thereby increases consumption, C. Any reduction in corporate tax increases post-tax profits, leading to an increase in investment expenditure, I. This results in AD increasing, ceteris paribus, as shown in Figure 3 where AD shifts from AD1 to AD2.	

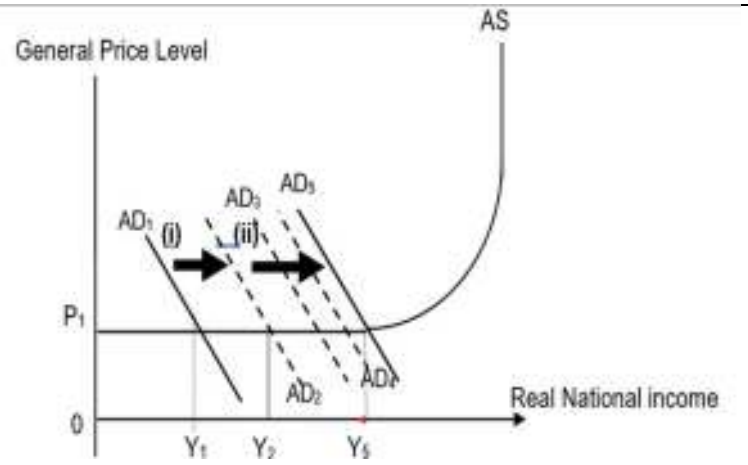


Figure 3: Increase in AD

Assuming the Singapore economy is not at full capacity, firms will employ more factors of production to increase production of output, which increases RNY from Y1 to Y2. This causes an increase in national income, which will increase income induced consumption and result in a further increase in AD.

This triggers successive rounds of increases in national income and income induced consumption. At each round, the increase in both gets smaller. The multiplier process will end when the increase in national income is too small to generate further increase in induced consumption.

Thus, the autonomous increase in AD from AD1 to AD2 results in a multiplied increase in RNY from Y1 to Y5 as illustrated in Figure 3 above. Thus, actual economic growth is achieved.

Furthermore, if the Singapore government spends on building up even better infrastructure to support firms, investment expenditure also increases as more investors are attracted to set up their production plant in Singapore. As mentioned in Extract 8, 'several vaccine manufacturing firms are currently constructing production facilities in Singapore, including BioNTech and Sanofi'. Since the productive capacity of the Singapore economy increases, there is potential growth as well.

Thus, fiscal policy can achieve sustained economic growth as there is an increase in both AD and AS i.e. a combination of actual and potential economic growth.

Moving on, it is undeniable that fiscal spending can minimise income inequality. This could be done by the Singapore government in sharing the benefits of growth with the majority of the population through the use of transfer payments. This helps to ensure that economic growth is inclusive by minimising income inequality,

		ensuring a more even distribution of income in the economy, **reducing the gini coefficient**. The progressive tax system adopted by the Singapore government helps to minimise income inequality as the higher income earners pay a higher marginal tax rates than the lower income earners. The tax revenue which is collected from the higher income earner can be redistributed as subsidies to make healthcare, education and housing affordable to lower income family, thereby minimising income inequality. **Evaluation: Limitations of alternative policy to sustain growth and minimise income inequality.** However, given that Singapore is a small and open economy with a small multiplier, there could be muted impact on actual growth even if G increases and T falls since the Singapore is driven by external rather than domestic demand. The Singapore government also needs to ensure that a higher income tax will not become a disincentive to work as labour is a vital resource which Singapore could tap on. This could instead lower purchasing power, resulting in a fall in C - a component of AD; thus this could instead stifle actual economic growth. **Summative Conclusion: Is digital transformation the most appropriate policy to achieve sustained economic growth, while minimizing the extent of income inequality?** **[Stand]** In conclusion, the pursuit of digital transformation alone may not be the most appropriate policy for Singapore to sustain its growth and minimise income inequality. **[Substantiation - Situation of STRAWS]** Given the demographics of an ageing population, digital transformation is likely to sustain growth but not minimise income inequality, an expansionary fiscal policy in the short run may be more pertinent in addressing the widening income gap caused by the displacement of low-skilled workers, which may be exacerbated by the pursuit of digital transformation. Many of the digital skills such as the use of Artificial Intelligence are emerging fields and Singapore's workers are unlikely to have been trained in these areas, as such it is likely to result in structural unemployment in the short-term. **[Something special - Recommendation of STRAWS]** Therefore, the Singapore government should implement both policies – fiscal policy in the short-run through a redistributive tax and transfer system to support those immediately displaced by automation efforts when digital transformation is introduced, the government should work closely with firms to ensure that workers have the opportunity to pursue digital skills training in the long-term so that they will be able	

to transit stable employment which can offer them a source of income such as the healthcare, finance or technology industries with many vacancies in Extract 5; thereby allowing the pursuit of economic growth without negative impact of income inequality.

Mark Scheme

Knowledge, Understanding, Interpretation, Application and Analysis		
Level	**Descriptors**	**Marks**
L2	A balanced response that contains well-explained economic reasoning and analysis on two policies that Singapore may implement in order to achieve sustainable economic growth (i.e. actual AND potential economic growth) and minimize income inequality. A two-sided response that considers two policy approaches that Singapore may employ to **only** achieve sustained economic growth (i.e. actual AND potential economic growth) **OR** minimize income inequality**.** – max 5m A two-sided response that considers two policy approaches that Singapore may employ to **both** achieve sustained economic growth **AND** minimize income inequality. **–** max 7m NOTE: Policy 1 may achieve sustained economic growth, whilst Policy 2 may minimize income inequality. Answers that discuss objectives being achieved by different policy instruments separately; may satisfy the requirements to get the max 7m.	4-7
L1	Mere listing of key terms and unexplained assertions, E.g. application of economic policy without linking it to economic outcomes in the question (i.e. sustained economic growth and income inequality). Answers may also demonstrate incorrect or no use of economic analysis (i.e. AD-AS analysis). A one-sided response that explains **one policy approach** that Singapore may	1-3

			employ to achieve sustained economic growth (i.e. actual AND potential economic growth) **AND** minimise income inequality. – max 3m A one-sided response that explains **one policy approach** that Singapore may employ to achieve sustained economic growth (i.e. actual AND potential economic growth) **OR** minimise income inequality. – max 2m		

Evaluation

Level	Descriptors	Marks
E3	One **explained** evaluative statement + One recommendation. 3rd EV mark can only be given when recommendation is supported using earlier evaluation	3
E2	One **explained** evaluative statement OR Two **weakly supported** evaluative statements. Comparison of strengths and/or limitation of the two policies considered well explained. E.g. of explained evaluative statement: The use of fiscal policy to finance government infrastructure will raise G and lead to a rise in AD, achieving actual and potential economic growth. This may require significant use of the government's budget, which incurs an opportunity cost. The government may have to cut down on the use of transfers and social spending such as subsidies on education and healthcare, which often are given to low-income households, to finance the infrastructure building. As such, the pursuit of economic growth through fiscal policy may actually worsen income inequality, as the government may shift their priorities away from supporting low-income households.	2

		E1	One evaluative statement that may be **poorly substantiated or not supported** by the arguments presented in the answer. E.g. of weakly supported evaluative statement: The use of digital transformation through the introduction of automation may lead to a rise in structural unemployment as the workers can be easily replaced.	1		