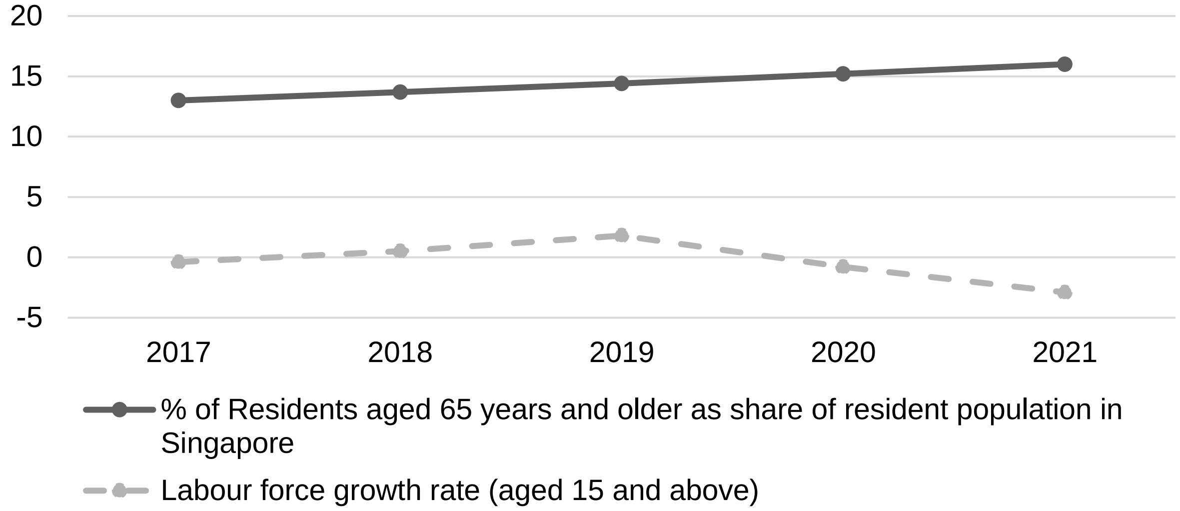
Question 2: Economic Impact of an ageing population

Figure 1: Population and Labour data of Singapore (in %)



Source: Singapore Department of Statistics & Statista, accessed on 23 July 2024

Extract 5: The costs of ageing

The number of people aged 65 years or older worldwide is projected to more than double, rising from 761 million in 2021 to 1.6 billion in 2050. The number of people aged 80 years or older is growing even faster. Population ageing is an irreversible global trend. It is the inevitable result of the demographic transition – the trend towards longer lives and smaller families – that is taking place even in countries with relatively youthful populations. As fertility levels fall, the share of younger people declines, while the shares of working age adults and, eventually, older people go up. Further population ageing is driven by more people living longer, healthier lives.

Ageing societies may face fiscal challenges due to rising costs in healthcare, long-term care, retirement and other old-age support, combined with a potential reduction in government revenue from fewer working-age taxpayers. Projections indicate that typically these programs will be unsustainable unless taxes are raised, benefits are reduced, or both.

Ageing societies tend to experience slower economic growth. However, economists are worried that even as Central Banks drive interest rates to fall, some firms may choose to cut investment spending in the domestic economy. Should firms become pessimistic, economy could have zero growth with high unemployment for many years.

Source: United Nations, Jan 2023
and: Cost of Ageing, Finance & Development, March 2017, Vol 54, No.1

Extract 6: Can ageing spark a surprise economic boom?

An ageing population could spur economies to adopt the use of greater technology alongside higher life expectancy to increase productivity the working population. This could potentially offset losses from a shrinking labour force. Some analysts predict that while ageing might slow down the country's Gross Domestic Product (GDP) growth rates, it may be unlikely to affect real income per capita – which is what matters most to people.

As a country's population growth slows or declines, a lower GDP growth doesn't necessarily mean that per capita income growth is slowing down. In addition, the population in such economies would have the chance to accumulate lots of capital for investment in their own health and education, since they have fewer dependents to spend on. This leads to a country which has more knowledgeable and experienced people. If governments are forward-looking and act early, encouraging such behaviour, this can potentially lead to improved productivity over longer lifespans. This could better prepare them for better jobs with higher pay in the future. Some research has suggested that ageing societies adopt labour-saving technologies more rapidly than younger societies, leading to them being more capital-intensive, hence, possibly earning higher per capita income than other countries.

Source: Adapted from Al Jazeera, Old is gold: Can ageing spark a surprise economic boom? 6 Jun 2023

Extract 7: Raising government revenue in Singapore as demographic changes

To keep up with increased spending in areas such as healthcare, the Singapore government faces some delicate trade-offs if it decides to raise revenue through higher personal income taxes, on top of the Goods and Services Tax (GST) hike. The structure of personal income tax in Singapore is generally progressive, which helps with income distribution. However, the trade-off includes balancing any possible increase in personal tax for higher-income earners with the need for Singapore to remain attractive to foreign talent.

This higher level of government spending is mostly being driven by increased spending in healthcare due to an ageing population. Proponents of a tax hike said that raising taxes is a "necessary evil" for Singapore if it wants to keep looking after the needs of an ageing population and improve its infrastructure. If revenue growth cannot match the spending pace, then something has to give – usually that's when governments run persistent budget deficits or pile up debts, which could lead to a debt burden on future generations.

Among potential sources of additional revenue, the GST is attractive in that it is an efficient tax, with a relatively low cost of collection and administration. Compared with income and wealth taxes, GST is imposed on all expenditure and its revenue is less correlated with business cycles and is therefore more stable and predictable. This is why most countries, developed and developing, have adopted a GST or value-added tax, many at rates higher than Singapore's. The drawback is that GST is a regressive tax. However, it is important to assess a fiscal system in its totality. The regressive impact of the GST is offset by progressive income taxes and significant fiscal transfers including subsidies on groceries and wage supplements which tops up the salaries of low-income workers to save for retirement. In fact, the expansion of these transfers has increased the overall progressivity of the system over the past two decades.

Source: Today, 10 February 2023 and Channel News Asia, 23 Jan 2022

Extract 8: Possible solutions to challenges due to ageing population

In recent years, many governments have taken on an added urgency to deal with their manpower and talent issues due to falling birthrates and a rapidly ageing population – which will add up to a drop in the number of working-age adults.

In Singapore, some suggest a need for foreign manpower and talent, amid its ageing and shrinking workforce. Foreigners are useful, especially in certain high skilled areas where there are just not enough Singaporeans and not enough time to train the Singaporeans to take advantage of the economic opportunities. However, there are Singaporeans who feel unhappiness, citing increases in competition for jobs, and prices of essential goods and services.

To reduce the immense pressure on welfare systems and the ratio of working-adults supporting a higher number of elderly people, governments are also raising the retirement age. For example, in Singapore, the retirement age is currently 63 years old and is expected to increase to 64 by 2026. Below is a Table showing the percentage of residents aged 65 and above who are employed or actively looking for a job across the years.

2018	**2019**	**2020**	**2021**	**2022**
27.8	28.7	30.1	32.9	32.1

Another solution is to raise productivity, which has been dragged down by inadequate investment in public infrastructure. Productivity could also be enhanced by cutting red tape to encourage investment and starting new businesses. For example, it takes 120 days to obtain a business license, more than double the OECD average. Digitalizing government services could also speed up processes. Singapore emphasizes greatly on the transformation of businesses, workers skills and embracing technology.

Sources: Channel News Asia, 10 June 2024,
and: Business Times, 28 Feb 2024
and: World Economic Forum. 27 Apr 2017

Suggested Answers		
(a)	**With reference to Figure 1, state the change in size of labour force from 2018 to 2021 and explain how this change could affect the labour market in Singapore.**	**[5]**
	The labour force growth rate had decreased from 2018 to 2021 to below 0%. This would mean that the size of the labour force has decreased. A decrease in labour force size would mean that the supply for labour will decrease. At current wage levels, the quantity demanded for labour will be more than quantity supplied resulting in a shortage. This would lead to a wage pressure upwards where the quantity demanded for labour will decrease and quantity supplied increase to a lower equilibrium quantity. State the change in the size of labour force [1] Link size of labour force as a supply factor [1] Wage-adjustment process [1] New market equilibrium, wage and quantity [2]	
(b)	**With reference to Extract 5, explain why the Central Banks would 'drive interest rate to fall' and suggest a reason why this would not always be effective.**	**[5]**
	The ageing population would affect growth negatively possibly due to falling consumption levels. To cushion the impact, Central Banks can 'drive interest rates to fall' as an expansionary policy. When interest rates are lowered, the cost of borrowing for households and firms will decrease. This will lead to an increase in C and I leading to an increase in AD. For countries that are not producing close to full employment, an increase in AD would lead to a fall in inventory of firms. This would cause firms to hire more resources to increase in production. This increase in production would lead to higher GDP and would also cause an increase in demand for labour, lowering the unemployment rate. *Note to marker: For this question, students should not have any gaps in their explanation. For example, students should not simply mention increase in AD leads to increase in growth.* However, the positive effect of lower interest rates on growth and employment is also dependent on the consumer and business confidence. With an ageing population, firms would predict a smaller revenue with falling sales due to falling consumption caused by a smaller population and lower income levels. Hence, profitability of businesses is projected to decline. Such poor business expectations would lead to an MEI which is interest-inelastic. Despite the lower interest rates which would lower the cost of borrowing, investments would still decrease or at most increase only slightly. Explain how interest rates would benefit an economy facing ageing population [3] Explain one reason why it may not be effective, must be from extract [2]	

(c)	**(i) Explain the meaning of real GDP per capita.**	**[2]**
	Real GDP refers to the total monetary value of all final goods and services produced within the geographical boundaries of an economy in a given period of time, adjusted for inflation. [1] Per capita refers to the average monetary value of goods and serviced produced by a citizen in that economy. [1]	
	(ii) Explain two possible reasons why real income per capita may not fall despite a slowdown in the GDP growth rate.	**[4]**
	A slowdown in GDP growth rate refers to an increasing nominal GDP but at a slower rate. Since GDP is still increasing, albeit at a slower pace, as long as nominal GDP growth rate is higher than inflation rate, real GDP growth rate will be positive and real income may not fall. As long as real GDP growth rate exceeds population growth rate, real GDP per capital will be increasing and real income per capital will not fall. 2 marks for each reason *Note to markers: only 1 mark given for answers which mention slow growth does not mean negative growth. To get 2, students should mention that there is a positive growth and population remains constant or grows in a smaller proportion.*	
(d)	**In Extract 7, it was mentioned that tax hikes are a 'necessary evil' for Singapore.** **With reference to Extract 7, comment on whether the Singapore government should raise income tax for higher income earners or implement a GST hike to increase its tax revenue.**	**[6]**
	The benefit of raising the income tax for higher income earners only is to protect the welfare of lower income households, as the higher income would pay a larger proportion of their income as tax compared to the lower income. However, it could make Singapore less attractive for foreign talent to work in and contribute to the economy because it lowers the disposable income as more of their income would be paid as taxes to the government. The benefit of GST is that it is easy to implement, stable and covers a large base to collect taxes from, resulting in more revenue collected. For example, these taxes are collected through almost all transactions of final goods and services. However, it could hurt the lower income households more as a larger proportion of their income is spent on necessities, which could impact their basic standard of living substantially. Raising GST may overall be a more appropriate strategy in Singapore as there are other mitigating strategies to cushion the impact on the lower income. For example, the progressive taxes collected from the higher income earners can be	

	redistributed back to the lower income through cash vouchers or subsidies. There are also other policies such as wage supplements, where the government tops up the wages of low-income workers. These policies ensure that the standard of living of the lower income households can remain stable or increase. Explain the benefits and unintended consequences of raising income tax for higher income earners [2] Explain the benefits and unintended consequences of raising GST [2] Evaluate why Singapore might choose one over the other [2]	
(e)	**Using aggregate demand and aggregate supply analysis, discuss the view that the costs of an ageing population outweigh the benefits to an economy.**	**[8]**

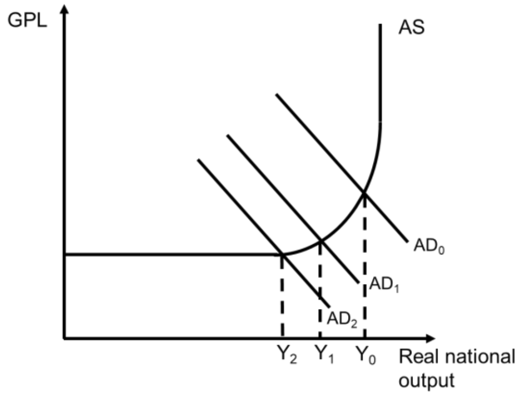
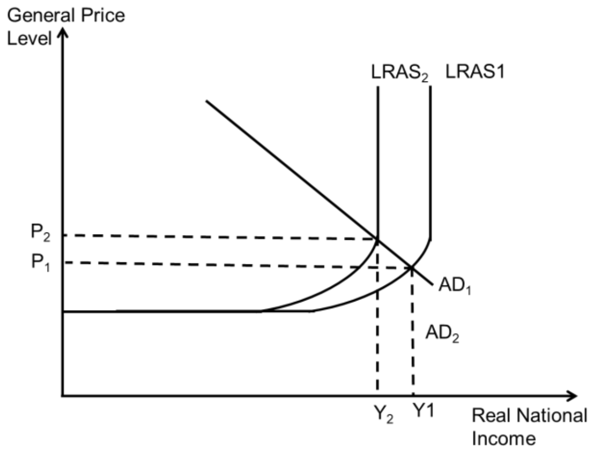
Command Word: Discuss whether… benefits outweigh costs	Candidates are expected to explain benefits of an ageing population and costs of an ageing population and evaluate which is more significant
Context:	None given, candidates can bring in examples from extracts or own knowledge
Concepts	AD/AS analysis Macro goals

Approach to question:
Requirement 1: Negative effects of ageing population on economy
Requirement 2: Positive effects of ageing population on economy
Evaluation: factors that determine which is more significant, for e.g., government preparedness and intervention, proposed retirement age etc.

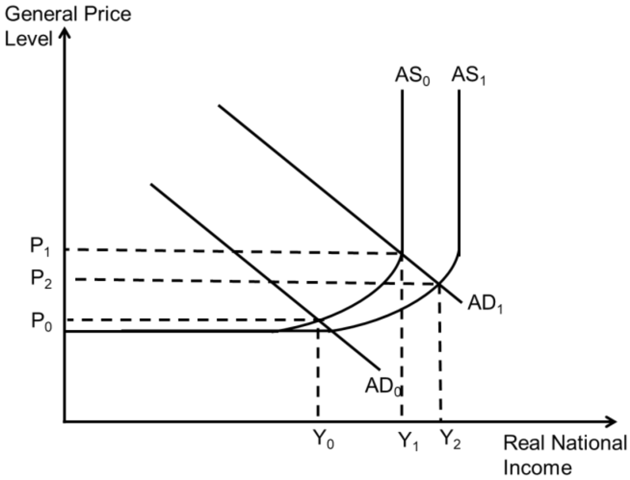
Introduction: An ageing population refers to a population in which the proportion of older people, 65 years and above, is increasing faster relative to the younger people, 64 years and below. There are several opportunities and challenges to an economy that can be discussed.

Requirement 1: Negative effects of ageing population on economy

With an ageing population, there will be an increased number of retired people relative to those in the labour force. This would mean that fewer people in the economy are earning an income, leading to a fall in C. In addition, in order to provide care and support for the elderly, governments may increase taxes to the working-age people (Extract 5 and 7), which decreases their disposable income and also causes C to decrease. Moreover, this would affect the future profitability of firms, driving them to be pessimistic and decreasing I (Extract 5). Both a fall in C and I will cause AD to decrease from AD1 to AD2. Assuming the economy is producing close to full employment, a decrease in AD would cause an unexpected surplus in inventory. Firms would respond by cutting down on production, causing the national income to decrease from RNY1 to RNY2, and actual economic growth has declined. As firms cut down production, demand for resources such as labour decreases causing an increase in demand-deficient

	unemployment. With falling incomes, this might cause a further fall in AD and further increase in unemployment, where the economy shrinks further due to the reverse multiplier effect.  With falling I and increase in retirees, this could cause a fall in the quality and quantity of resources. This would cause the LRAS of the economy to decrease from LRAS1 to LRAS2, where potential growth has declined. Assuming the economy is producing close to full employment, a fall in LRAS would cause a greater competition for resource, bidding up prices and causing the GPL to increase from GPL1 to GPL2, where demand-pull inflation has occurred due to supply side constraints.  **Requirement 2:** Positive effects of ageing population on economy An ageing population could be beneficial as many of these retirees have accumulated wealth and savings during their working years to consume in old age and invest in developing themselves (Extract 6). Moreover, to support the elderly through their old age, especially for countries like Singapore with a high life expectancy, governments have boosted spending on the healthcare sector such as specialised services, elderly-friendly infrastructure and lifelong learning education institutions and courses. As a result, both C and G would increase, causing an increase in AD. This would cause a shortage in inventory and firms would hire more resources to increase production and economic growth and SOL can still be sustained. Evaluation: However, this is dependent on the ability of the labour force to accumulate wealth and savings over their working years, as well as the	

government budget available for such huge expenditure. While these may be high in countries like Singapore, it may be less likely in developing countries where many work in lower paying jobs and governments have less resources and stability.



As governments plan early and capitalise on improving its labour resource through lifelong learning or increasing productivity through technology, this can lead to an increase of productivity of workers as a whole, over longer lifespans. This will lead to an increase in LRAS, and a higher potential growth as a result. Assuming the economy is producing close to full employment, this could lead to lower GPL as firms need not bid higher prices for resources as much as before, and a greater opportunity for the economy to expand its economy in future.

Conclusion:
An ageing population would have some immediate concerns especially with a falling AD and LRAS. Nonetheless, they present opportunities especially in sectors which are catered to the older population. For it to be overall beneficial to an economy, governments would need to be forward-looking and implement policies to train workers, improve productivity over longer lifespans and even consider raising the retirement age.

Level	Quality of analysis	Marks
L2	• Accurate economic analysis (using AD/AS) for both benefits and costs of an ageing population on macro goals • Good and relevant use case material to support arguments A + K/C: 6 marks C + C or A + 0: 5 marks C + K: 4 marks	**4-6**
L1	• Inaccurate or minimal use of economic analysis for benefits and costs of an ageing population on macro goals • Minimal use of case material to support arguments C + 0: 3 marks K + K: 2 marks K + 0: 1 mark *For A, need AD and AS factor, impact on at least 2 different macro goals and full elaboration.* *If wrong trigger but AD/AS analysis still accurate, max K*	**1-3**
E2	Comparison between the significance of benefits vs costs using a logical criteria	**2**
E1	One unsupported evaluative idea	**1**

(f) **According to Extract 3, some countries are adopting labour policies such as increasing immigration to address the challenges of an ageing population.**

Discuss whether a country should increase immigration or increase productivity to achieve a higher economic growth in the future. **[10]**

Discuss whether… should.. or..	Candidates are expected to explain how immigration and at least 1 other policy promote economic growth in the future Candidates are also expected to explain limitations of each policy and evaluate based on a criteria which is better.
Context	Economy with ageing population
Concept	Macro policies Actual and potential growth AD/AS analysis

Approach to question:
Requirement 1: immigration promotes both actual and potential growth
Requirement 2: second policy promotes actual and potential growth
Evaluation: limitations of each policy and criteria to determine which is best

Introduction:
As discussed earlier, an ageing population would cause challenges such as a slowdown in actual and potential growth in an economy. For an economy to achieve higher growth in the future, governments have to consider finding alternative ways to maintain or increase the amount of labour resource and keep productive capacity growing.

Requirement 1: immigration policies can promote both actual and potential growth

As labour resources decline due to an increased number of retirements, LRAS would decrease and cause growth to slow down. Immigration policies that encourage labour to enter the country and find jobs would help to make up for the loss in workers due to the retirees. To maintain or increase LRAS, the rate of immigrants coming to look for jobs have to equal or outweigh the rate of retirements. Assuming the economy is currently producing close to full employment, this would mean that firms would not need to bid higher prices for resources even as production and GDP increases.

Moreover, with an increase in population due to an increased number of immigrants, there would be more purchases of basic necessities, services and even luxury goods. This could also mitigate the pessimism in firms due to the expected falling profitability of investments. This would lead to an increase in C and I boosting AD, where actual growth increases as firms increase production due to the shortage in inventory due to the increase in demand.

Limitations:
Immigrants may not have similar or the same level of skills as the local people. This would mean that more immigrants may need to compensate each retiree. Moreover, this could lead to strain in public resources and friction with the local people due to differing lifestyles.

For example, Singaporeans non-material standard of living will decrease if they are unhappy with the increase competition for jobs. With an increase in demand for essential goods and services due to more immigrants in the country, this might cause an increase in the prices, negatively affecting their material standard of living.

The increase in C by the immigrants may not be as significant too, as many of these workers might remit their wages back to their home countries for their families.

Requirement 2: Increasing productivity through technology and transformation of businesses can promote actual and potential growth

By investing in public infrastructure and relaxing regulations to encourage investments and innovation, this could increase G and I. As they are components of AD, AD will increase, leading to an increase in RNY as firms face a shortage in their inventory and increase production, assuming the economy is not producing close to full employment.

These increase in productivity of resources can also improve on the quality of resources, mitigating the challenges of a slowing growth in the labour force. For example, digitalizing government services and processes and an increase utilization of technology (Extract 8) can help firms to be more productive with their given resources. As more businesses have support to increase innovation, new and efficient ways of production can be discovered too. These will maintain or even growth the LRAS, leading to potential growth.

Limitations:
The ability for government to increase in productivity is also dependent on the amount of government revenue there is. While ageing population is an important issue, different countries may have different economic priorities that limit the amount of government revenue available to support business and government transformation.

The positive effect of increasing productivity is also more likely seen in the longer run only, as skills, development of technology and transformation of processes and mindsets take time to see fruition.

Conclusion:
Labour policies such as increased immigration is necessary to mitigate the falling quantity of resources especially in the short run. As it presents its challenges, it might also be necessary to explore other complementing labour policies such as increasing the retirement age, to keep more people in the labour force for a longer time period, to ensure that growth can continue to be sustained. In the longer run, it is inevitable that the government boosts the quality of its resources to reduce the reliance on labour over time. Nonetheless, boosting productivity through technological advancements may not be sufficient to totally replace certain skills of humans. Hence, governments need to have a good mix of policies to increase economic growth in the future.

Level	Quality of analysis	Marks
L2	• Accurate economic analysis of immigration and increasing productivity • Links to both actual and potential growth • Relevant and good use of extracts to substantiate arguments A + A: 7 marks	**4-7**

	A + C: 6 marks A + 0/K: 5 marks C + C: 5 or 6 marks	
L1	• Inaccurate or minimal use of economic analysis for both immigration and increasing productivity • Minimal use of case material to support arguments C + K: 4 marks C + 0: 3 marks K + K: 2 marks K + 0: 1 mark	**1-3**
E2	Limitations for both policies and an reasoned judgement of which policy is better using sound criteria	**2-3**
E1	One unsupported evaluative idea	**1**

[Total: 40]

End of paper