Suggested answer scheme:

(a)	(i) With reference to Table 1, compare the government expenditure per student on primary and university education in Singapore between 2010 and 2016.	[2]
	 Similarity: Government expenditure per student on primary and university education both increased overall during 2010 to 2016. Difference: 	
	 Expenditure per student on primary education has always been lower than that on university education. OR The increase in expenditure per student on primary education is around 	
	10 times more than that on university education.	
	(ii) Explain one possible reason for the difference observed in (a)(i).	[2]
	For 1 st difference - The expenditure on university education on a per student basis has always been higher than that for primary education: The cost of university education has always been higher than that of primary education due to the need for research facilities and equipment, payment of salaries to professors (who are more highly trained/skilled and command higher wages), etc. However, university class sizes are smaller compared to primary schools, leading to a higher government expenditure per student on university education compared to primary education throughout the time period.	
	OR For 2 nd difference above - The increase in expenditure per student on primary education is more than that on university education: This may be because the government has perceived the extent of the market failure in primary education to be larger over the years . This is because the external benefit of primary education to the whole population is large compared to its private benefits, whereas the large private benefits of university education incentivise individuals to pursue higher education (Ext 2).	
(b)	With reference to Extract 2, explain how investment in human capital can 'raise incomes for the whole economy'.	[4]
	Investment in human capital would mean increased spending on education and training of labour, which increases quality of labour due to productivity gains (Ext 2). This leads to an increase in productive capacity of the economy. As a result, the LRAS increases, leading to potential growth as full employment level of output increases. As the Singapore economy operates close to full capacity, AD is high enough. Moreover, the rise in G on education and training in the short run will cause AD to rise and be high as well. This causes the potential growth to be actualised. The increase in real output leads to firms hiring more labour and hence wages rise in the economy, leading to an increase in real incomes, which 'raises incomes for the whole economy'.	

(c)	Use the concept of opportunity cost to explain one possible effect on each of consumers of education and the US government due to the 'rising student debt levels' described in Extract 3	[4]
	 'rising student debt levels' described in Extract 3. Interpret rising student debt level: The increase in price of university education in US has led to more students taking loans to fund their education. Define opportunity cost (or embed definition in answer): Opportunity cost refers to the highest valued alternative that is sacrificed when an option is chosen. Effect of rising student debt levels on consumers of education: With rising student debt levels, consumers of education (high-school students) have to make a choice between pursuing higher education or going to work, as suggested in Extract 3. If they choose to pursue higher education, the opportunity cost would be the income earned from working (next best alternative) that is foregone. OR With rising student debt levels, students have to choose to continue education and hence incur the debt or use the money to spend on other goods and services e.g. graduation holiday trip. Therefore, the opportunity cost of choosing to service the rising debt is the satisfaction from the graduation holiday trip that is forgone. Effect of rising student debt levels on US government: Rising student debt levels would mean that the government would need to raise the amount of financial aid to keep higher education affordable, as suggested in Extract 3. Thus, with a limited budget, the government would have less to spend on other sectors such as healthcare (next best alternative) when they choose to spend more on financial aid for university students. The opportunity cost would thus be the benefit to society from spending more on healthcare that is foregone. 	
(d)	Assess whether supply factors, rather than demand factors, are the key cause of rising price of university education in Singapore.	[8]
	 Identify supply factors: Ext 1: Increased labour costs, cost to university of owning and maintaining buildings, covering utilities and buying research equipment. These would lead to a rise in unit COP, lowering profit per unit and hence causing producers to reduce qty supplied at every price. This leads to a fall in supply of university education. Ext 1: subsidies on university education. This leads to a fall in unit COP, thereby causing an increase in SS. Overall, supply of university education is likely to have fallen since the 'large' rise in labour costs along with other costs stated above may outweigh the effect of subsidies on university education, which are most likely increasing marginally by around 6% over the years based on the increase in govt spending per student (Table 1). 	
	 Identify demand factors: Ext 1: Singapore's median household income grew 10%. 	

Table 2: increase in Singapore's GDP per capita. These suggest an increase in incomes and hence purchasing power of consumers, increasing the demand for university education, assuming it is a normal good (YED>0).

• Ext 2: A greater desire for personal fulfilment and increased desire to learn specialised skills.

These would lead to a further rise in demand due to increased preference for higher education.

Thesis: Supply factors are more important than demand factors

• **[Fall in SS & MAP]** With the overall fall in supply of university education from S1 to S2 (Fig 1), at the initial price P1, there is a shortage of E1A. This leads to an upward pressure on price. As price rises, quantity demanded starts to fall and quantity supplied starts to rise until a new equilibrium is reached at E2 where the shortage is eliminated. At the new equilibrium, price has increased from P1 to P2 and quantity has fallen from Q1 to Q2.



- **[Rise in DD]** At E2, with the rise in demand for university education from D1 to D2, the resultant shortage at P2 leads to an upward pressure on price. At the new equilibrium E3, price has risen further from P2 to P3 and quantity increased from Q2 to Q3.
- **[Overall impact of both shifts on price]** Both the fall in supply and rise in demand reinforce each other and lead to a rise in price of university education from P1 to P3. This explains the 'jump' in price of university education mentioned in Ext 1.
- SS factors are more important in causing this increase in price because Ext 1 suggests increase in labour cost is a 'large' contributing factor, despite the subsidies. Coupled with the increases in other costs stated above, this would have caused a large fall in SS, leading to a large rise in price.

<u>EV:</u> However, the PED< 1 for education as it may be deemed as a necessity. With the fall in supply, the price of university education would rise to a larger extent compared to a situation whereby PED>1. Hence, there is a sharp

increase in price with the fall in supply. This implies that the demand factor of PED<1 is a very important cause of the rise in price, rather than the supply factor.

 Moreover, 0<YED<1 for education since it is considered a normal necessity. Thus, the rise in income leads to a less than proportionate increase in DD, implying that the fall in supply may be a more important factor that is driving the price up.

Anti-thesis: Demand factors may be more important than supply factors

• Ext 2 suggests there is a large increase in DD for higher education as there is a greater desire among young Singaporeans to opt for higher education. Coupled with the rise in demand due to the rise in incomes, the increase in demand may have played a large role in driving up the price of university education.

EV: However, PES<1 for higher education in the short run as it takes time to gather the necessary factor inputs such as skilled professors, land for building new campuses etc to respond to rising prices. Hence, compared to a situation where PES>1, the increase in dd will lead to a sharp rise in price due to the PES<1. This implies that the supply factor of PES<1 is a very important cause of the rise in price, rather than the demand factor.

Conclusion:

Overall, both demand and supply factors account for the large rise in price of university education by 38% (Ext 1).

[Ranking of supply and demand factors] However, Ext 1 suggests that 'large' rise in costs have led to the large rise in prices. Moreover, real incomes actually fell in Singapore as rise in household income of 10% is less than the rise in CPI of 25% (Ext 1), suggesting that supply factors in the form of rise in costs and PES<1 may have played a key role in causing the large rise in price of university education compared to the demand factors.

Mark scheme:

Level	Knowledge, Application & Understanding	Marks
L2	For a rigorous analysis of whether supply factors rather than demand factors are the key cause of rising price of university education, with good use of relevant case materials.	4-6
.1	For a descriptive explanation (lacking in economic linkages and analysis), with limited or no use of case materials. May contain conceptual errors.	1-3
Level	Evaluation	Marks
E	For an evaluation based on economic analysis and arriving at a judgement on whether supply	1-2

	factors are the key cause of the rising price of	
(e)	Discuss whether Singapore should follow the US in lowering its higher	[10]
	objectives.	
	Introduction	
	Clarify "micro-economic objectives"	
	- Efficiency in the allocation of a country's limited resources	
	- Equity in the distribution of a country's resources	
	Anti - Thesis: Singapore should not follow US in lowering higher	
	education subsidies	
	 Need to subsidise due to inefficiency in market for higher education (merit good). 	
	 The price mechanism fails to allocate resources efficiently in the market 	
	for university education as it is considered to be a merit good. Merit goods	
	are goods that the government believes consumers will buy too few units	
	If provided by the market because of information failure (under-estimation of the private benefite in consumption) and positive externalities in	
	consumption.	
	 Information failure occurs in the consumption of university education as 	
	consumers underestimate the private benefits of consuming the good. For	
	example, university education increases the productivity of individuals and	
	leads to increases in employability and wages (Ext 2). Such increases in future income are uncertain and difficult to estimate accurately. Hence, this	
	lack of information causes individuals to underestimate the private benefits	
	of consuming education, as mentioned in Ext 2 as well. The perceived	
	benefits of consuming the good (MPBif in Fig 2) are less than the true	
	benefits of consuming the good (MPBpk).	
	 Consumption of higher education also generates positive externalities. Bosidos the private hopofits, with productivity gains from higher education 	
	(Ext 2), there are also external benefits on third parties such as citizens	
	who are neither producers nor consumers of university education but	
	benefit from the raised incomes for the economy (as explained in (b)	
	above) which help to create more jobs, lower poverty and crime rates (Ext	
	2), without compensation. As consumers are only concerned about their private bonefits and costs, they ignore such external bonefits and under	
	consume the good. Hence, as social benefit = private benefit + external	
	benefits, the marginal social benefit curve (MSB) lies above the marginal	
	private benefit curve (MPBpk) in Fig 2 below.	



- Assuming no externalities in production, S=MPC=MSC. The social optimum occurs where MSB = MSC at output level 0Qs where society's welfare is maximized. The market equilibrium occurs where MPB = MPC at output level 0Qp where private welfare is maximized. Hence, there is an under-production and under-consumption of university education of QsQp units. This under-allocation of resources to the market leads to a loss of welfare to society, or a deadweight loss of area AEpEs. Thus, there is market failure.
- [Analyse how subsidy works] As a result, there is a need for the govt to subsidise to ensure efficient allocation of resources. A subsidy per unit of EsB (the divergence at the social optimum output level) provided by the government will lead to a fall in unit cost of production and hence a rightward shift in the supply curve from S1 to S2, causing the new market equilibrium level of output (where MPBif = S2) to coincide with the social optimum level at 0Qs. The under-allocation of resources is corrected and the deadweight loss is eliminated, thereby eliminating the market failure.

EV: However, the extent of market failure is smaller for university education compared to primary education. As seen in part (a), the external benefit of primary education to the whole population is large compared to its private benefits, causing the government to spend more to make it more accessible. On the other hand, the large private benefits of university education incentivise individuals to pursue higher education (as suggested in Ext 2) and hence less government spending is required compared to primary education. Thus, the govt may not need to intervene as much in higher education through such large subsidies.

2. Need to subsidise due to inequity: Access to university education is a major issue in many countries and is subsidised for equity reasons as most countries consider education as a basic right or necessity. As income is unequally distributed, households with lower income may have problems affording basic education and especially university education, given that university education is usually more expensive. Given rising price of higher education in Singapore (as explained in part d), and US facing high student debt levels due to education being unaffordable (Ext 3), this leads to inequity. Hence, the market fails to allocate resources in a fair and just manner. This further justifies the need to subsidise to lower the market price rather than reducing subsidies.

EV: Ext 1 shows that price of university education has shot up. Besides equity concerns, given the nature of Singapore's economy where investing in human capital is essential for boosting competitiveness and ensuring higher growth and employment, higher education needs to be made affordable. Hence, it may not be appropriate for Singapore to follow the US in further reducing university subsidies in the midst of the rising price of university education.

EV: However, Gini coefficient is lower in Singapore than USA (Table 2). This shows that Singapore suffers from less income inequality and therefore less inequity in society as compared to the US and hence Singapore need not subsidise education as much.

<u>Thesis: Singapore should follow the US in lowering higher education</u> <u>subsidies</u>

1. Possibility of over-subsidy due to information failure of government: It is justified to lower higher education subsidies in US and Singapore if there is a possible case of over-subsidy in the market for university education due to information failure of the government. Overestimation of positive externalities and imperfect information leads to over subsidised university education. This would lead to a situation of overproduction where the market produces at an output level that is higher than the social optimum, leading to an over-allocation of resources and hence allocative inefficiency. If this intervention by the government creates a greater welfare loss compared to the initial situation before intervention, government failure ensues. In such a scenario, it may be justified to reduce higher education subsidies as it would lead to a more efficient outcome.

EV: [Comparison of likelihood of information failure of govt in US and SG] US is a much larger country compared to Singapore in terms of geographical area. This may lead to a higher possibility of info failure of govt leading to inaccurate estimation of the amount of positive externalities and information failure generated in society, leading to inaccurate estimation of the amount of subsidy per unit to provide for higher education. Singapore being a smaller country may not face such a big issue of over-subsidy as compared to the US, making the above scenario less likely to occur.

2. Opportunity cost of spending on higher education: Ext 1 suggests that there is a need to spend on other areas besides university education due to ageing population in Singapore. Spending on large subsidies on university education may therefore lead to an opportunity cost in the form of the benefits to society of spending on other areas, such as healthcare and infrastructure for the elderly, that has to be sacrificed. This may lead to a possible misallocation of resources if the loss in benefits from spending on healthcare outweigh the benefits gained from spending on university education. **EV:** However, Singapore has mostly faced a budget surplus (Fig 1) unlike the US which faced budget deficits. Thus, the above opportunity cost of spending more on university education despite such a budget constraint may be larger in the case of US. Hence, this may not be as big of a concern to the Singapore government.

Synthesis and Conclusion:

- Overall, there are definitely benefits of subsidising university education in terms of efficiency and equity. The extent of market failure and budget position in US could be the main reason why US is lowering higher education subsidies. Singapore is not facing the same budget constraint since we have budget reserves. Hence, the decision on whether Singapore should follow the US in reducing university subsidies requires us to weigh the possible benefit and cost that could arise as a result.
- However, keeping in view that income inequality is relatively lower in Singapore compared to the US and the extent of market failure at university level may be considered smaller compared to lower levels of education, reduction of university subsidies in Singapore may be justified on the whole. Moreover, given the increasing needs in other sectors especially with the ageing population (Ext 1), it may be more appropriate to use needs-based subsidies such as those mentioned in Ext 3 so as to achieve greater equity while ensuring the government is able to allocate its resources to other areas that are in urgent need of attention.

Mark scheme:

Level	Knowledge, Application, Understanding & Analysis	Marks
L2	Thorough explanation using relevant economic concepts of whether Singapore should follow the US in reducing higher education subsidies, with reference to relevant case materials.	4-7
L1	Descriptive explanation with limited or no reference to relevant case materials. May contain conceptual errors.	1-3
	Up to 3 additional marks for evaluation	
E2	Well-explained judgement on whether it is justified for Singapore to reduce higher education subsidies like the US.	2-3
E1	For unexplained judgement or mere statements without elaboration.	1