ANGLO-CHINESE JUNIOR COLLEGE
JC1 Economics

| **H2**	**PRICE MECHANISM & ITS APPLICATION** **Tutorial Worksheet 2**

Section A: Discussion Questions

Question 1: Market for bubble tea in Singapore

a) With the aid of a diagram, explain the effects of the following events on the market for bubble tea in Singapore:

Note

- *When going through the question approach, do use the CCC framework to get the students to identify concepts, command word, and context. Concepts include "market", which indicates the use of demand and supply concepts; skills needed come from the Command word "explain" and "aid of diagram" and Context is the "bubble tea in Singapore".*
- *Do remind students to draw and label their diagrams in a complete and correct manner. They should also refer to the diagram drawn as they are writing their explanation.*

**a) Increase in workers' productivity after attending training courses**
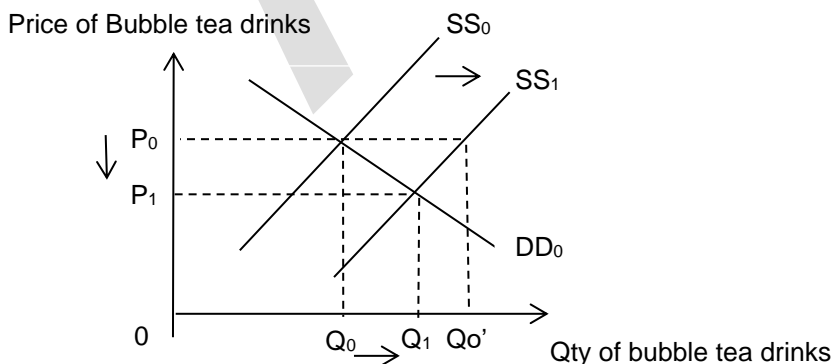
- *Factor: An increase in workers' productivity (measured by output per man-hour) would mean that more bubble tea can be produced by each worker, with no change in the number of hours worked. What this means to the producer is that at each price level, the firm is now able to produce more output; for example, at price level Po, the quantity supplied has increased from Qo to Qo'. This shows that the supply of bubble tea in Singapore has increased, and it is illustrated by a rightward shift of the supply curve from SS_0 to SS_1, as shown above.*
- *Interaction: With the rise in supply, and demand remaining unchanged, there will be a surplus of QoQo' at the original price P_0 and this exerts a downward pressure on price, as firms are willing and able to produce a higher quantity of bubble tea drinks, and consumers require a lower price in order to be willing and able to increase their consumption. As price increases, quantity demanded rises and quantity supplied falls, hence reducing the surplus.*
- *Effect: This eventually leads to a decrease in the equilibrium price of bubble tea drink from Po to P_1 and a rise in equilibrium quantity from Q_0 to Q_1.*

Note
- *The framework of "Factors, Interaction, Effect" is how to explain the given issues with economic analysis (demand supply framework, in this case). Without economic analysis, answers will score poorly, even if it is logical.*
- *There are different economic frameworks for different topics.*
- *With reference to the skills package, the paragraph writing skill of TEEL (topic sentence, explanation, examples, link), "explanation" in economics usually involves an economic framework or model. For demand supply, that framework is "Factors, Interaction, Effect". The answer provided above does not have a "topic sentence, examples or a link" because these are basic questions and does not require them yet.*

**b) Increased spending on advertisements by bubble tea shops**
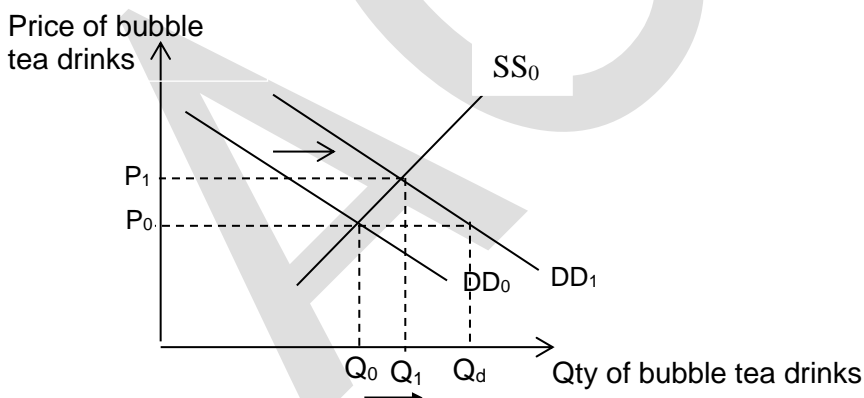
- *Factor: An increased spending on advertisements by bubble tea shops leads to more awareness (actual or perceived) of the benefits of their products and hence influence consumers' tastes and preferences to consume towards bubble tea. As a result, the demand for bubble tea in Singapore would increase and this is represented by a rightward shift of the demand curve from DDo to DD_1, as shown above.*
- *Interaction: When demand increases, it creates a shortage of bubble tea of Q_0Q_d at the original price P_0 on the diagram. This leads to an upward pressure on price as consumers are willing and able to pay higher prices to obtain the bubble tea which is currently in*

shortage, and bubble tea shops require a higher payment to be willing and able to supply their goods.

- *Effect: As price increases, quantity of bubble tea demanded decreases while quantity supplied increases. Finally, equilibrium price increase from P_0 to P_1 and equilibrium quantity increases from Q_0 to Q_1.*

c) Singapore experiencing negative economic growth and a higher Goods and Services Tax
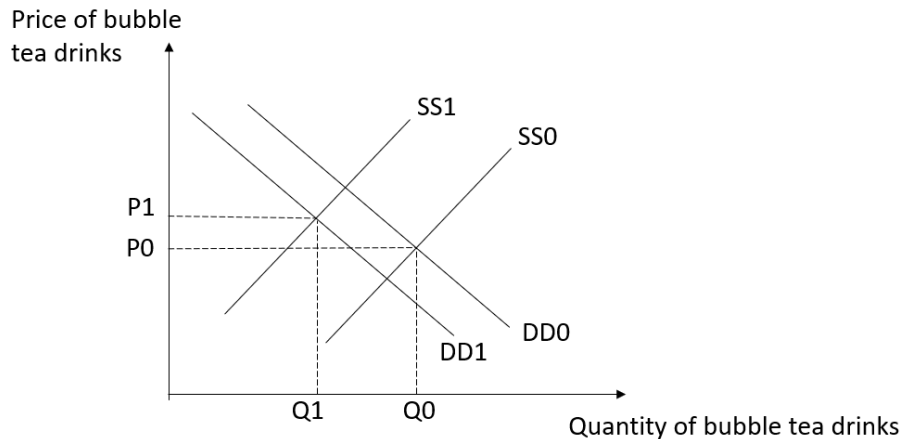
- *Factor: Negative economic growth experienced in the year implies a fall in household income. The fall in income reduces consumers' willing and ability to consume, causing demand to fall. This shifts the demand curve to the left from DD0 to DD1.*
- *Factor: At the same time, the higher GST implies bubble tea shops have to pay more for raw materials (e.g. sugar, milk, tea, cups, etc). This increases the costs of production, reducing firms' willingness and ability to supply bubble tea at each price level. This is illustrated by a leftward shift of the supply curve from SS_0 to SS_1.*
- *Interaction: Due to both the demand supply shocks, at initial price (P0), there is a shortage. This causes consumers to compete for the good, bidding up price in the process.*
- *Effect: Price increases until the new quantity demanded and supplied is the same at the new equilibrium point P1, Q1. (Note: Price increases for sure because both the demand and supply shocks, even on their own, would lead to a shortage and therefore price increase. Both shocks reinforce the increase in price.)*
- *Interaction: However, depends on the extent of the shift of the demand and supply curves. The rise in demand is likely to be smaller than the decrease in supply, as Singaporeans tend to already enjoy bubble tea significantly and hence are unlikely to increase their demand of bubble tea to a large extent.*
- *Effect: Therefore, there would be a decrease in equilibrium output from Q_0 to Q_1, assuming that the increase in demand is smaller than the decrease in supply. (Note: this assumption that demand changes to a smaller extent than supply may not always be. Any persuasive and logic reason for demand to change to a larger extent is also acceptable).*

Note:

- *Here, "interaction and effect" is done twice because the effect on price is certain, but the impact on quantity is uncertain and depends on whether the demand changes more than the supply. However, it is also accepted to only do "interaction and effect" once, so long the answer considers the extent to which demand changes relative to supply. Both answers will be awarded full credit since the difference is in terms of organisation but contains the exact same economic content.*
- *Alternative acceptable explanation: although the economy is still growing at a slower rate, negative economic sentiments caused by the slowing economic growth might prompt households to start saving ahead of an anticipated rise in unemployment rate / pay cuts. Demand would then fall instead of rise by a small extent. Coupled with the decrease in supply, the market would experience a decrease in equilibrium output while the impact on equilibrium price depends on the extent of the change in demand versus supply.*

Question 2: Supermarkets offer drivers higher pay amidst shortage

UK's 3 largest supermarkets, Asda, Tesco and Sainsbury's reported increased delivery costs after having to raise wages of their driver. Big supermarket chains, desperate to ensure their food products such as ice-cream, salad and canned drinks gets to their stores, these supermarkets are offering drivers of heavy goods vehicles (HGV) nearly double the market rate. Industry insiders say HGV drivers' wages have already risen by between 10% and 20% as a result of the shortage HGV drivers.

Logistics UK, which represents freight owners including supermarkets, has estimated a shortage of 90,000 HGV drivers. It can take more than six months to train a new HGV driver.

A surge in demand for home delivery during the pandemic has offered a whole range of alternative employment for drivers, especially for drivers capable of driving long-distances in HGVs. The situation is exacerbated by EU workers leaving the UK following Brexit.

Source: The Guardian, 27 July 2021

a) **Using demand and supply diagram, account for the increase in UK's HGV drivers' wages.**

- *Wage is the price of labour (i.e. UK's HGV drivers)*
- *Factor: There was an increase in demand for delivery services during the pandemic. With lockdowns and people keeping indoors in fear of being infected online shopping increases, including grocery shopping. Also increase preference for shopping at nearest supermarkets. This increases the demand for drivers to transport goods from suppliers to the retailers as well as collection centres and then to the buyers' homes. Foreign workers from EU leaving UK following Brexit. Hence many EU HGV drivers who used to work in the UK left the country, causing fall in supply of HGV drivers in the country*
- *Interaction: As a result of both an increase in demand and fall in supply, there will be a shortage of workers at the initial wage level (P0). This causes firms to compete for workers, offering higher wages to attract workers, bidding up wages.*
- *Effect: Wages rise until the new quantity demanded equals to the quantity supplied at the new equilibrium, P1, Q1.*
- *Extent of effect: Furthermore, the supply of HGV drivers takes time to respond to the increase in demand and rising wages. This is because the HGV drivers are certified skilled drivers and it takes 6 month to train a new HDV driver. Therefore, the quantity supply of workers would not be increased much despite higher wages. Supply of workers is therefore wage inelastic. An increase in wage leads to a less than proportionate increase in quantity supplied of workers. As a result, the shortage will persist if wage increases only by a small extent. To clear the shortage fully, wage needs to increase more significantly.*

Diagram
o
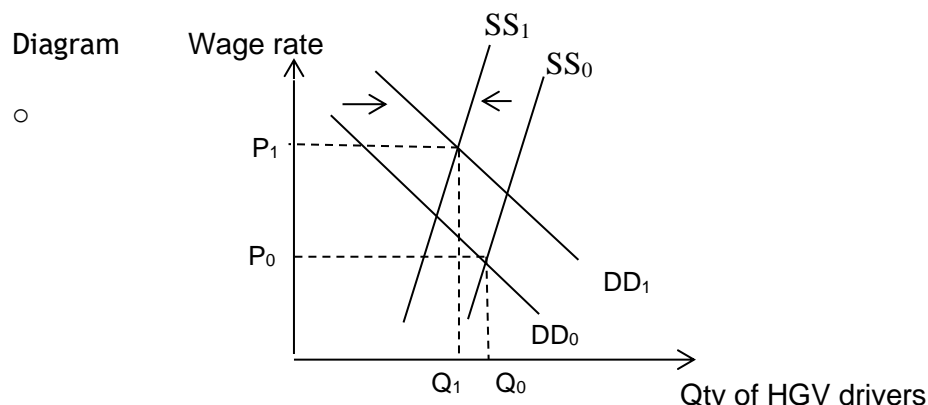
b) Do you think it is possible for the earnings of the Grab driver or food delivery rider to increase as high as that of the HGV driver? Explain your reason.

- *Factor: The demand for private hire transportation and food delivery has increased, increasing the demand for grab drives and food delivery riders. The current level of demand for these services is therefore relatively high. It is possible that the level of demand of these services would even be the same as the demand for HGV drivers. However, the supply for grab drivers and food delivery riders is likely to be higher than HGVs drivers since there is little skilled expertise to provide such services and drivers and riders can easily enter the industry, contributing to a high level of supply of such drivers. Meanwhile, the supply for HGVs drivers is generally low because it requires a higher expertise (e.g. different license) which fewer workers possess.*
- *Interaction: As a result, the market for grab drivers and food delivery riders would likely clear (i.e. quantity demanded = quantity supplied) at a lower wage than that of HGV drivers. If instead the wage of grab drivers and food delivery riders were equal to HGV drivers, there would likely be a surplus, causing wage to be bid down, proving that such a wage would not be sustainable and cannot be the equilibrium wage.*
- *Effect: It is likely that HGVs would have a higher wage.*

Note:
- *There is a difference between "high wages" and "increase in wages". Consider whether Grab drivers' wages can be as high as that of the HGC drivers.*

c) Consider the effect of the increase in drivers' wage on prices of supermarkets' food items.

- *Factor: Drivers are a factor of production for supermarkets since divers are needed to deliver the foods from shipping ports / farms / factories to the physical supermarket stores. An increase in wages increases the cost of transportation, and hence cost of production for supermarkets. This reduces the supply for supermarket foods.*
- *Interaction: As a result, there will be a shortage of food at the initial price level (P0). This causes consumers to compete for food, bidding up price.*
- *Effect: Price of supermarket foods are likely to increase.*

Question 3:

Apple and Huawei's brand image

Apple has perfected the art of pushing up the price of its flagship phones, but without any significant impact on demand. However, the best thing for Apple is that, with this strategy, even a drop in volumes will ensure high revenue. Its success comes from its understanding that smartphones are the most essential commodity for a lot of its users. These customers will buy it at a higher price as they are convinced of the value it brings to them. In recent years, Apple has also developed a range of products — like Apple Arcade, Apple Music, AirPods, and the Apple Watch. The iPhone serves as a catalyst to lure people into its ecosystem and keep them hooked for whatever may be next.

Huawei's new flagship smartphone shows it has the technological know-how to compete with the best Apple and Samsung products on the market but to really take on the top two it needs to work on building its brand.

<div align="right">Source: Marketing Week, 17 October 2018 and Business Insider, 27 April 2020</div>

a) **Do you think Huawei should follow Apple's pricing strategy to increase its total revenue from its smartphone sales?**

Note:
- *The answer suggested below focuses more on the thought process of the question rather than presenting a strict exam-answering style of writing.*

Breaking down the question:
- *What is Apple's pricing strategy? How does Apple's pricing strategy leads to increase in its total revenue*
- *Is Huawei's demand for its mobile phone similar to that of Apple? How is Huawei's demand different from that of Apple's demand?*
- *What would be the effect on Huawei's strategy if it were to follow Apple's strategy?*

Apple's pricing strategy
- *Apple ensures high prices for its mobile phones and continue to increase the prices of its flagship phones to increase its total revenue.*
- *This is because the demand for its mobile phones is price inelastic. i.e. PED<1. Increasing its prices will lower the quantity demanded for its mobile phones by a smaller proportion. This is because consumers deem Apple phones to be high-end. Apple's consumers are also mainly higher income earners. Also, many people who are already in the Apple ecosystem find it difficult to switch away from Iphones. Android phones are therefore not good substitutes.*
- *Decreasing the price of Iphones would cause the quantity demanded for iphones to increase less than proportionally. The revenue gained from more sales would therefore be less than the revenue lost from price falling, implying that total revenue would fall instead. Therefore Apple maintains a high price for iphones.*
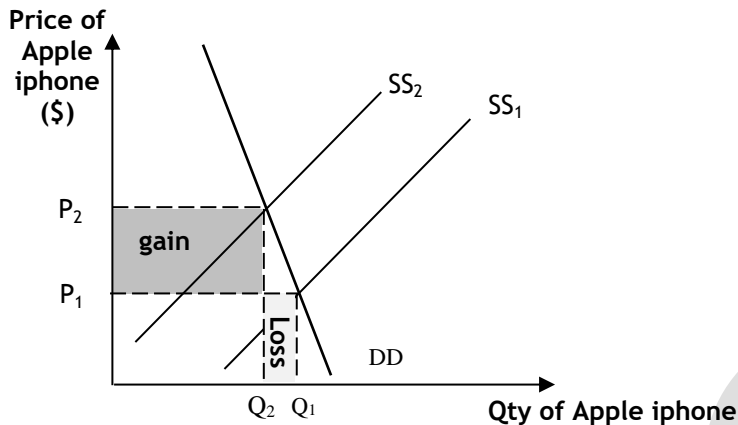
Huawei should not follow Apple's pricing strategy
- *Unlike Apple's hp, Huawei's handphones is more price elastic as consumers do have as high regards for Huawei's hp. Even Huawei's high-end highly technological advanced smartphone are not considered as good substitutes to the iphone.*
- *Instead, Huawei's handphones are good substitutes for other brands' smartphones like Samsung and Oppo. Hence Huawei's handphones have a price elastic demand. An increase in the prices of its handphones will lead to a more than proportional fall in quantity demanded, causing the revenue gained from higher prices to be less than the revenue lost from lower sales. Total revenue of Huawei would fall if they increased their price (follow Apple's strategy).*
- *They would therefore not follow Apple's strategy.*

b) How can Huawei increase its total revenue for its smartphone sales?

i)   By keeping its prices competitive. (explained above)

ii)   Build up its brand through advertising and branding to improve its image so that its highly technological advanced smartphone would be better substitutes to other brands of similar handphones. This will lower the PED of its highly technological advanced smartphone → can set higher prices on these hps → increase its total revenue from the sale of its highly technological advanced smartphone.

Question 4: Cross elasticity of demand and income elasticity of demand

With Respect to a change in price of:	Cross Elasticity of Demand of:			Income elasticity of demand
	chicken	beef	fish	
Chicken	-1.64	0.28	0.29	1.07
Beef	1.10	-2.61	-0.23	2.19
Fish	1.57	-0.19	-2.48	1.44

Source: Khoiriyah Nikmatul Et. Al., Animal Food Demand In Jakarta, Indonesia, Russian Journal Of Agricultural And Socio-Economic Sciences, April 2019

a) **Explain the relationship between fish and chicken from the data above**

Fish and chicken are substitutes as they have positive XED values to each other. XED of chicken to a change in price of fish = 1.57 while XED of fish to a change in price of chicken = 0.29. Being substitutes imply that fish can be consumed instead of chicken, and vice versa.

An increase in the price of fish leads to an increase in demand for chicken. This is because a higher price of fish leads to a fall in quantity demanded for fish. In place of fish, consumers switch to consuming chicken. Hence the demand for chickens would increase.

Likewise, an increase in the price of chicken leads to an increase in demand for fish.

Additionally, the XED between fish and chicken is positive and more than 1 (XED > 1). An increase in the price of fish leads to a larger than proportionate increase in demand for chicken. This implies fish and chickens are strong substitutes. Intuitively, consumers really don't mind consuming either fish or chicken and can easily switch between them. However, the magnitude of the XED value between beef and fish is less than one. An increase in the price of beef leads to a less than proportionate increase in demand for fish. Being negative implies that beef and fish are complements. However, being less than one implies they are only weak complements. Intuitively, consumers do not always need to consume beef and fish together.

b) **Explain the likely XED value and relationship between fish and fries.**
Fish and fries are often eaten together. Hence, they are complements. The XED value is likely to be negative. A rise in the price for good A (e.g. fish) would cause a fall in quantity demanded for fish. There would therefore be less need for fries to be consumed together. This lead to a fall in demand for good B (e.g. fries).

The magnitude of the XED value depends on how strong a complementary relationship fish and fries have. Strong complements have an XED value of less than negative one.

c) **Why is the XED of chicken to a change in price of beef much higher than the XED of beef to the change in price of chicken**

While initially counter-intuitive, a possible reason for this is that chicken is the most consumed source of animal protein across most cultures. Many consumers who eat beef can also eat chicken, while not all consumers who eat chicken eat beef (either due to preferences or religious commitments).

Hence XED of chicken to change in price of beef is elastic (XED = 1.10). An increase in the price of beef leads to a more than proportionate increase in demand for chicken because these consumers can consume either beef or chicken (the assumption is that most consumers who eat beef can also eat chicken). When the price of one protein source (beef) increase, they switch to consuming the alternate protein source (chicken).

On the other hand, the XED of beef to the change in price of chicken is only inelastic (XED = 0.28). An increase in the price of chicken leads to a less than proportionate increase in the demand for beef because there are some consumers who do not eat beef, even though they eat chicken. Hence, when the price of chicken increase, fewer consumers switch to beef.

d) How can the supermarket operator use the above information on elasticities of demand in planning its sales strategies to increase its revenue?

Price elasticity of demand
- *The supermarket operator can use PED to decide on price to increase its total revenue.*
- *Fish, beef and chicken have a demand that is price elastic. With this knowledge, the supermarket operator can lower price of these food items to increase its total revenue. Price can be lower by increasing the supply for chicken and beef, causing the supply curve to shift right.*

- *Lowering price from P_1 to P_2 will lead to a more than proportionate increase in quantity demanded. Hence, the gain in revenue from the increased quantities sold would be greater than the loss in revenue from selling each unit at a lower price. The total revenue would ultimately increase.*

Income elasticity of demand

- *The YED can help supermarkets decide on their choice of products to sell.*

- *For example, all products listed above has a YED value that is positive This implies that the above goods are normal goods. In times of economic growth, household incomes would increase. The demand for normal goods would increase when income increases, allowing P and Q to increase for the firm. Consequently, total revenue would increase.*

- *Furthermore, the YED is not only positive, but also more than one, implying that are normal goods, but also luxuries. This means that an increase in household income would*

cause a more than proportionate increase in the demand for these goods, allow total revenue to increase greatly.

- *In times of economic growth, supermarkets should display and sell more normal goods, and even more luxury goods.*

- *However, in times of recession where household incomes fall, the demand for normal goods would fall.*

- *Supermarkets should display and sell inferior goods with negative YED values instead because a fall in income would lead to a rise in the demand for inferior good. This would allow the total revenue for these supermarkets to increase during a recession.*

Cross elasticity of demand
- *Beef and fish are complements and have negative XED. Decreasing the price of one good will increase the demand for another good. This is because decreasing the price of beef, for example, would lead to more people being willing and able to consume beef. That is, an increase in quantity demanded for beef. Beef being complements with fish means that people consume beef and fish together. With more people consuming beef, the demand for fish will also increase so that they can be consumed together.*
- *A possible strategy, therefore, would be to reduce the price of goods with many complementary relationships (XED < 0 with other goods, and/or to reduce the price of goods with strong complementary relationship (XED< -1) with other goods. This would increase the demand for more goods sold at the supermarket.*

- *Beef and chicken are substitutes, given they have a positive XED. This means if the price of chicken increases, consumers would not mind switching to a relatively cheaper alternative instead – beef. Hence the demand for beef would increase.*
- *Supermarkets could potentially use the XED value to decide how much stock of which good to display and sell. For example, if the price of chicken increases due to an increase in the cost of production, supermarkets could prepare to stock up and sell more beef since the demand for beef is likely to increase in response.*

Question 5: (2019 H2 CA1)

Extract 2: Sugar tax on pre-packaged drinks

The Ministry of Health (MOH) is considering imposing sugar tax on manufacturers and importers of high-sugar pre-packaged drinks, which includes not only soda drinks but also juices and pre-packaged dry drinks, such as three-in-one coffee, tea and chocolate drinks that people just need to add water to.

Countries that have already implemented such a tax are happy despite collecting very little tax revenue, as the tax is doing its job of reducing the amount of sugar in these drinks in their fight against obesity and diabetes. The higher cost would push the producers to reduce the amount of sugar in their products and motivate them to move towards producing healthier drinks to remain competitive. The tax will also encourage consumers to shift their consumption patterns towards the healthier options.

However, large industry players such as Nestle, Coca-cola, PepsiCo and Food Industry Asia (FIA) said that many scientific studies have suggested the limited effectiveness of a sugar tax on reducing consumption of sugar-sweetened beverages. Consumers could easily substitute the pre-packed sugary drinks with other sugary food and drinks that are not taxed, such as bubble tea and coffees and teas made on the spot.

Source: CNA, 4 December 2018

a) Using a diagram, explain the effect of a sugar tax on consumers and producers of sugary drinks.

Question analysis:
- *Command word: "explain", no need for a balanced perspective or evaluation.*
- *Concept:*
  - *Start point: "sugar tax" (placed on either consumers or producer, both are acceptable since the question does not specify)*
  - *End point:*
    - *"impact on consumers", in terms of affordability (price), consumer expenditure, consumer surplus*
    - *"impact on producers", in terms of producer revenue, producer surplus – therefore requires DDSS analysis*
- *Context: "sugary drinks"*

Factor: A sugar tax that is levied on producers causes firms to raise the price they are willing and able to sell sugary drinks at every quantity by the unit tax amount so that they will receive the same unit revenue after paying taxes. This is reflected through an upward / leftward shift in the supply curve from SS0 to SSt.

Interaction: At the original price, P0, there will be a shortage. The shortage forces consumers to compete for sugary drinks, bidding up the price. As price increase, quantity demanded falls while quantity supplied rise. Price stops increasing when the quantity demanded equals quantity supplied at the new equilibrium (P1, Q1).

Effect: P1 is the new price paid by consumers. However, after paying a unit-tax amount equivalent to the distance E1-C to the government, producers only effectively receive a price Pt. Meanwhile, the tax revenue collected by the government is P1E1CT.
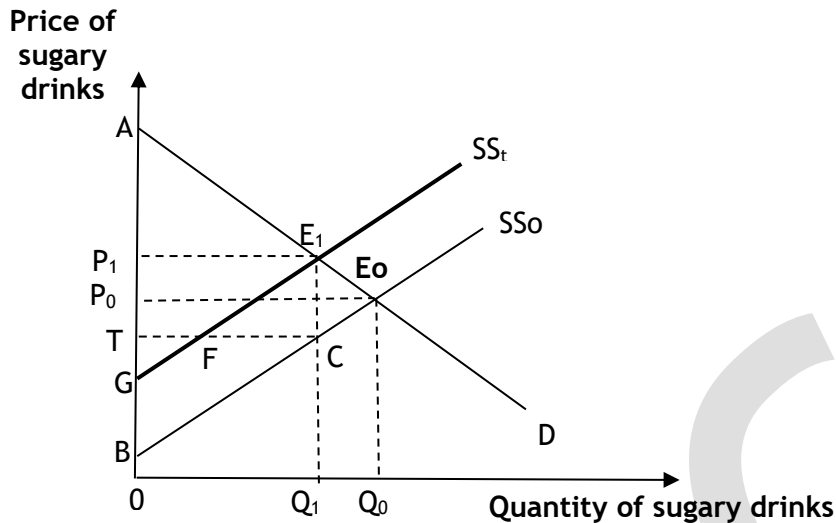
Effect on consumers:

Consumers now have to pay higher price from P_0 to P_1, and enjoy lower quantity from Q_0 to Q_1. Consumer surplus is also reduced from Area AE_0P_0 to Area AP_1E_1

Effect of producers:

Although the price of sugary drinks has increased, the producers' total revenue is now reduced from Area $0P_0E_0Q_0$ to Area $0TCQ_1$. This is because the producers now sell less sugary drinks from Q_0 to Q_1, and Area P_1E_1CT is the tax that is paid to the government. Producer surplus is also reduced from Area P_0E_0B to Area TCB

b) Consider the factors that affect the effectiveness of sugar tax on pre-packaged drinks in reducing the consumption of sugary food and drinks.

Effectiveness of the sugary drinks in reducing the consumption of sugary foods depends on several factors:

- *Price elasticity of demand: Sugary taxes is not very effective if consumers' demand in price inelastic. This could be due to consumers' high income and affluence lifestyle, hence expenditure on sugary drinks is just a small proportion of their income. Hence increasing the price of pre-packaged drinks only leads to a smaller proportionate fall in quantity demanded.*

- *Availability of substitutes to pre-packaged drinks: Sugar tax imposed only on pre-packaged drinks is not very effective if the tax is not imposed on other sugary drinks and food. Consumers will respond to the rising price of pre-packaged drinks by turning to drinks made on the spot such as bubble tea drinks and in-house made drinks at the food courts. The tax also may not be effective if consumers' preference for sweetened cakes and cookies is more than sweetened drinks. Tax on sugary drinks may not have a great impact on their overall sugar consumption.*

c) Identify and explain possible problems / unintended consequences the government may encounter in imposing the sugar tax on pre-packaged drinks.

Possible unintended consequences:
- *Increase sugar consumption from made-on-the-spot drinks that are not taxed (e.g. bubble tea, coffee, tea, other sweetened beverages).*
- *Illegal import and sale of sugary drinks that invade tax.*
- *The loss in revenue and profits of some firms that depend heavily on selling sugary drinks.*

Question 6

Table 2: Annual Car Population in Singapore

	2012	2013	2014	2015	2016	2017	2018	2019
No. of cars	605,149	607,292	600,176	575,353	552,427	546,706	551,575	555,540

Source: LTA

Using Table 2, describe the trend of car population between 2012 and 2019.　　　　**[2]**

General trend: There is a falling trend in the annual car population in Singapore between 2012 and 2019.

Refinement: However, there was a rise in car population in 2018 & 2019.

Note
- *Refer to the skills package for more information on data interpretation and analysis question*

Question 7

Figure 2: Global price of palm oil

Using Figure 2, compare the overall change in global palm oil prices from Jan-2009 to Jan-2011 with that of mid-2012 to mid-2015.　　　　**[1]**

Difference: Global palm oil prices increased between Jan-2009 to Jan-2011. However, it fell between mid-2012 to mid-2015.

Note:
- *Answers to questions with command word "compare" can include similarities and/or differences.*
- *If only 1 mark is awarded for the question, the answer is usually a difference. This, however, is not always the case. Answer each question on a case-by-case basis.*
- *The question requires you to compare the "change", not the "trend". An answer that compares the trend instead of the changes will not be awarded any marks.*

Question 8

Figure 3: Percentage of Ecommerce Revenue by Device
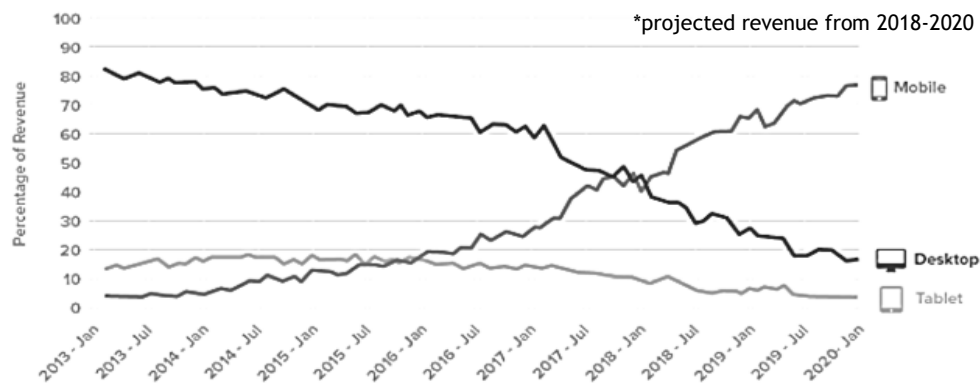
Using Figure 3, compare the trend in the percentages of ecommerce revenue by tablet and desktop between Jan 2015 and Jan 2020. **[2]**

Similarity: The percentages of e-commerce revenue for tablet and desktop are both generally decreasing.

Difference: However, the percentage of e-commerce revenue for desktop decreases more than the percentage of e-commerce revenue for tablet.

**Question 9: Fashion at What Cost** (Adapted from VJC 2019 Promo Exam)

Extract 1: The Rise of Polyester

The popularity of cotton is no accident. Cotton textile has a long history with man, and it has endured because its unique properties make it ideal for clothing. Cotton textile is attractive, durable, comfortable, takes to dyes and most importantly its' fibre is naturally occurring. However, as production of cotton has plateaued, polyester has stepped in to fill the void. Polyester is a generalised term for any fabric or textile, which is made using polyester yarns or fibres. It is a shortened name for a synthetic, man-made polymer, most commonly made from crude oil. Because polyester is easy to blend with other materials, remarkably improved in its look and feel, it has allowed clothing manufacturers to keep churning out more and more cheap clothes.

Polyester accounts for roughly half of the overall textile market and around 80 per cent of synthetic textile, according to the Textile Exchange Preferred Fibre Material Report. In 2016, polyester production is estimated at 52 million metric tons. The price slide for polyester began in 2014 when oil prices fell by more than half. The explosion of polyester production has also put downward pressure on cotton prices.

Source: Adapted from Quartz June 2015

Figure 1: Cotton and Polyester Price Index (Jan 2014 = 100)
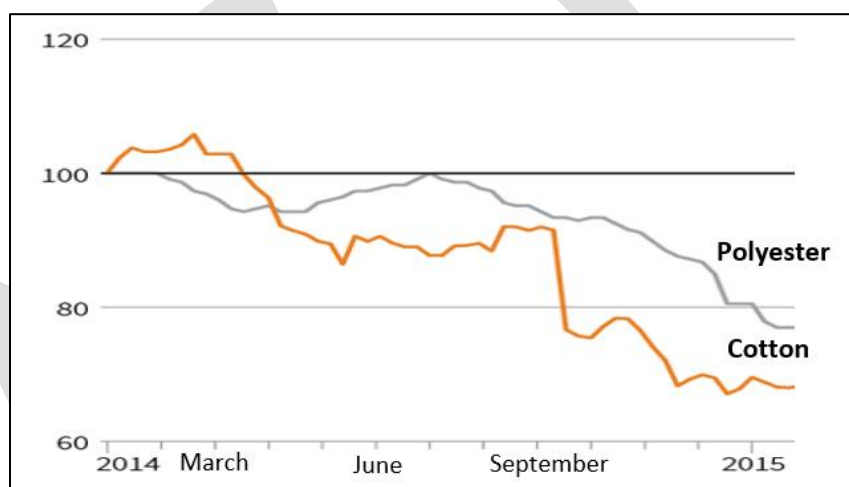
Source: Reuters

Extract 2: Steep Hike in Cotton Minimum Support Price

The steep hike of 28% in the minimum support price (MSP) on cotton produce by the Indian central government has come as a surprise after five consecutive years of single-digit increases. However, given the recent pest attacks and reduction in crop production, MSPs will work well to keep Indian farmers committed to cotton cultivation, in spite of adversities. Given that India is now the largest producer of cotton after it overtook US and China in 2015-2016, it pays to support farmers in cotton growing. Besides, the MSP will mitigate the risk of price volatility too.

"The increase in MSP will have a big impact on the prices of textile. In the run up to the upcoming festive season, we foresee a 8-10 percent rise in the cost of cotton textile," said

Vijay Purohit, president of Gujarat Garment Textile Association, a body that manages 5,000 garment units in the state.

Cotton is the key material for textile production in India, extensively used to develop casual, formal and festive apparels. A 10 percent rise in price only resulted in a 5 percent fall in the sales volume of cotton textile. Experts believe the price of cotton produce will continue to move northward.

Source: Adapted from various sources

(a)	(i)	**Compare the price changes of cotton and polyester from April 2014 to January 2015.**	[2]
		Similarity: *Both prices of cotton and polyester fell [1]* *Difference*: *Price of cotton fell more significantly than the price of polyester [1]*	
	(ii)	**Explain one possible reason for the difference in the change in price of cotton and polyester between September 2014 and January 2015.**	[2]
		Identify reason: The price cotton could have fallen by a greater extent because there might have been a greater decrease in the demand for cotton relative to that of polyester. [1] *Explain reason (how it led to smaller fall in price of cotton): This implies that the surplus of cotton at the original price is larger than that of polyester. Hence, a larger fall in price is needed to eliminate the surplus for cotton than for polyester. [1]* *Other possible reasons:* • *The supply for cotton also fell while that of polyester remained constant* • *The supply / demand for cotton and cotton is more price inelastic than that of polyester*	
(b)	(i)	**Using information in Extract 1, explain the likely relationship between polyester fibre and crude oil.**	[2]
		Identify relationship: Crude oil is a factor of production for polyester fiber. [1] *Explain relationship: Crude oil is needed to produce polyester. [1]*	
	(ii)	**How might the relationship identified in b(i) account for the price changes of cotton from April 2014 to January 2015.**	[4]
		Polyester market	

		Factor: Given that crude oil is a factor for producing polyester, the fall in the price of crude oil lowers the unit cost of producing polyester. This increases firms' willingness and ability to supply polyester at each price level, reflected by a rightward shift in the supply curve. [1] *Interaction and effect*: This causes a surplus for polyester at the original price, bidding down the price of polyester. The fall in price in therefore accounted for. [1] *Cotton market* *Factor:* Given that polyester and cotton are substitutes, the fall in the price of cotton causes a decrease in the demand for cotton as consumers switch to the cheaper alternative, shifting the demand for cotton rightwards. [1] *Interaction and effect:* This would cause a surplus for cotton at the original price, bidding down the price of cotton. The fall in price of cotton is therefore accounted for. [1]	
(c)		With reference to Extract 2,	
	(i)	**What is a "minimum support price"?**	[2]
		A minimum support price is the minimum permissible price that producers may legally charge for a particular good [1], in this case cotton plant, set above the market equilibrium price [1].	
	(ii)	**How will the minimum support price keep rational Indian "farmers committed to cotton cultivation"?**	[5]
		Decision rule: Rational farmers aim to maximise their profits. This is achieved when Marginal benefits (MB) of producing an additional unit of cotton plant equals the marginal costs (MC). [1] *Benefit:* Given that the minimum support price is set above the current market price of cotton, it increases the price of each unit of cotton sold by Indian farmers. This, in turn, increases the marginal benefit of cultivating cotton. [1] *Cost:* Assuming the minimum support price does not affect the costs of cultivating cotton, the marginal cost of doing so remains constant. [1] *Constraint:* The minimum support price also does not change the constraints for farming cotton (e.g. land available, budget constraints, legality, etc) [1] *Explaining the decision:* At the original quantity of cotton being cultivated, the minimum support price causes the MB to now be greater than the MC. This incentivises farmers seeking to maximise profits to switch to producing cotton or to produce more cotton, until the new MB equals MC. [1]	

(d)	Using the concept of price elasticity of demand, discuss the likely impact of increased cotton fibre prices on the revenue of India's textile firms.	[8]

Question analysis:
- *Command word: "discuss" requires a balanced perspective on whether the increase in cotton fibre prices may decrease the textile firms' revenue or not, and requires an evaluative insight*
- *Concept:*
  - *Start point: "increased cotton fibre prices"*
  - *End point: "Revenue of textile firms" – therefore requires DDSS analysis*
- *Context: India's textile firms*

Requirement 1 / Topic Sentence: The increase in cotton fibre price will cause the price of textile to increase.
Explanation / Example: Cotton is a necessary input for textile manufacturing. A rise in cotton fibre prices increases the costs of producing cotton textile. Producers are less willing to offer the same output for sale at every price, thereby causing supply of cotton textile to fall from S0 to S1. At the original price P0, there is now a shortage which exerts upward pressure on the price. As price rise, quantity demanded will fall while the quantity supplied rises. This continues until the shortage is cleared and the price of cotton textile has risen while the equilibrium quantity of cotton would have fallen.

Requirement 2 / Topic Sentence: The increase in cotton fibre price will cause the total revenue of textile firms to rise if the demand for textile is price inelastic.
Explanation / Example: Price elasticity of demand for cotton textile measures the degree of responsiveness of the quantity demanded of textile to a change in price, ceteris paribus. The demand for cotton textile in India should be price inelastic since there are few suitable substitutes within the same price range. Extract 2 suggests that a 10% rise in price results in only 5% fall in sales volume, i.e. that PED is about 0.5. Hence, the demand for cotton textile is price inelastic with coefficient less than one, and the rise in price will lead to a less than proportionate fall in quantity demanded the cotton textile. Textile firms will experience a rise in revenue since the revenue gained from the higher price is greater than the revenue lost from the less than proportionate increase in quantity.

Evaluative conclusion: However, if the demand for cotton textile is price elastic (|PED|>1) then the rise in price will lead to a more than proportionate change in the quantity demanded for cotton textile. Textile firms will experience a fall in revenue since the revenue gained from the higher price will less than the lost revenue from the more than proportionate fall in the quantity. This is possible in the longer term where consumers may be more receptive to using other textiles to substitute cotton. This would cause the demand for cotton to become price elastic. In that case, any further increase in cotton fibre prices may adversely impact the total revenue of the textile firms.

Question 10

Hens tend to go into a slow egg laying mode during the cooler winter months. Meanwhile, increased meat prices have also resulted in consumers switching to eggs as a cheaper source of protein.

(a) Using demand and supply analysis, explain the likely effects of these changes on the market for eggs and a related market such as the pastries market.   [10]

Question analysis

- *Command word: : "explain", no need for a balanced perspective or evaluation.*
- *Concept:*
  - *Start point: "these changes" (from the preamble) – "Hans going into slow egg laying mode" and "increased meat prices"*
  - *End point: "market for eggs" – P and Q, and "related market / pastries market" – P and Q*
- *Context:*
 - *Eggs and pastries market*

<u>*Requirement 1 / Topic sentence:*</u> ***The abovementioned effects are likely to cause the price and quantity of eggs to increase.***
<u>*Factors (explaining the change in demand):*</u> *As eggs and fresh meat are seen as substitutes (XED>0) for protein, increased meat prices should result in consumers switching to the cheaper alternative, increasing the demand for eggs. This causes a rightwards shift of the demand curve from D1 to D2. Moreover, eggs and fresh meat are relatively strong substitutes (XED>1) so the increase in meat prices may cause the demand for eggs to increase by a large extent. This is because eggs are also a source of complete proteins and have similar nutritional content to meat.*

(Acceptable to argue that they are weak substitutes, and that demand would shift right to a small extent too. For example, consumers are more likely to switch to frozen meat or other close protein sources e.g. fish instead).

<u>*Factors (explaining the change in supply):*</u> *Due to changes in weather to cooler winter months, hens tend to go into a slow egg laying mode, leading to a decrease in the supply of eggs, shifting the supply curve from S1 to S2. However, given that modern chickens are reared indoors with some ability for farmers to control the temperature, supply may only fall slightly. This is seen by a leftward shift in supply from S1 to S2.*

Figure 1: Market for Eggs
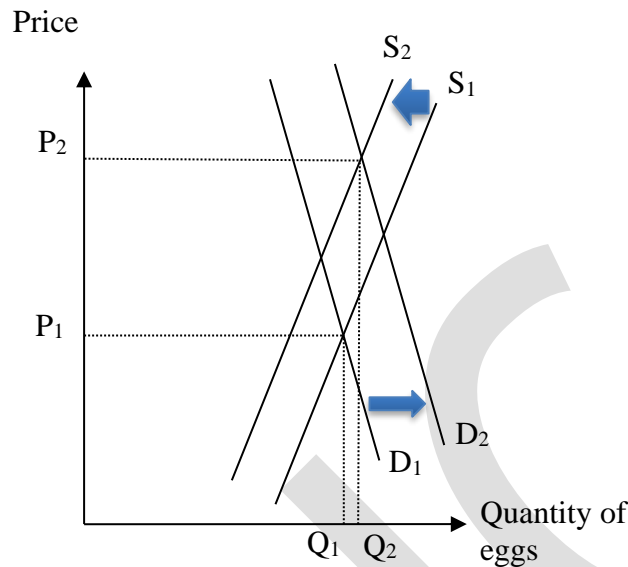
Interaction (getting from the initial to the new equilibrium through the price adjustment process): Both the demand and supply shock would result in a shortage at the initial price P0. Hence, consumers compete for eggs and bid up prices in the process. As price increase, quantity demanded falls and quantity supplied increases. Given than the supply of eggs is relatively price inelastic as freshly hatched eggs have a short shelf life and producers are unable to stock up unsold eggs for a long period of time, the increase in price causes the quantity supplied to increase less than proportionally. This implies a large increase in price is required to eliminate the shortage.

Effect (reporting the change in price and quantity) / Link: Hence, the price of eggs will increase sharply. Additionally, given the rightward shift in demand is likely to be greater than the leftward shift in supply, the new equilibrium quantity of eggs would also be higher.

Note: The entire "factor, interaction, effect" is the "explanation and examples" in the TEEL writing framework.

Requirement 2 / Topic sentence: The abovementioned effects are likely to cause the price of pastries to increase and quantity of pastries to fall.

Factors (explaining the change in supply): Eggs are a key ingredient to make pastries. Thus, as the prices of eggs increase, the cost of production for pastries will also increase. This will lead to a decrease in the supply for pastries, represented as a leftward shift of the SS curve from S_3 to S_4 as shown in Figure 2 below.

Figure 2: Market for Pastries
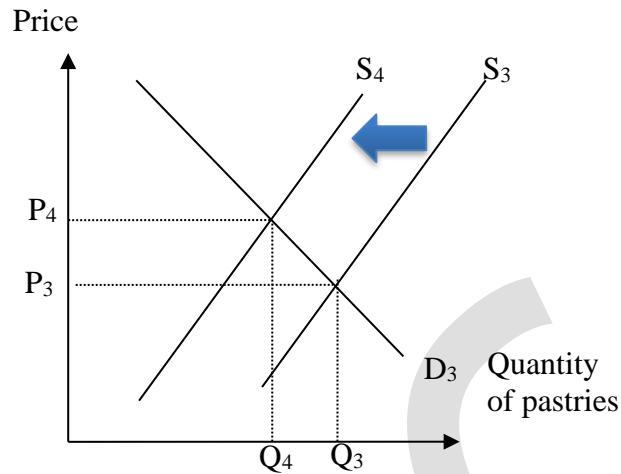
Interaction (getting from the initial to the new equilibrium through the price adjustment process):
The shortage at the original market equilibrium price P_3 will cause an upward pressure on the price. The demand for pastries is likely to be price elastic (PED > 1) as there are many other close substitutes to pastries like bread and cakes. This would imply that when the price of pastries increases, quantity demanded will decrease more than proportionate, ceteris paribus. Hence, a small increase in price in sufficient to eliminate the shortage of pastries.

Effect (reporting the change in price and quantity) / Link: Ultimately, the price of pastries will increase while the quantity of pastries would fall.

Level	Knowledge, Application, Understanding and Analysis	Marks
L3	• *For a well-developed answer that uses appropriate demand and supply analysis (including PED and PES concepts) to explain how the stated events affect **both** the markets for eggs and pastries.* • *Effective use of diagrams to analyse impact on price and quantity of market for eggs and pastries.*	8-10
L2	• *Explanation of how the stated events affect the market for eggs and pastries but inaccurate/incomplete explanation of impact on equilibrium price and quantity.* • *Ineffective/inaccurate use of diagram to analyse impact on price and quantity*	5-7
L1	• *Mere listing of stated DD and SS factors but not much application to equilibrium price and quantity* • *No reference to the market for eggs and pastries*	1-4

Question 11 (2016 A Level Essay Question 2)

The price of a pair of jeans can be as little as S$20 or as much as S$500.

(a) Explain what might cause the price elasticity of demand and cross elasticity of demand to be different for different products. [10]

Question analysis

- *Command word: "explain", no need for a balanced perspective or evaluation.*
- *Concept:*
    - *Start point: Determinants of PED and XED*
    - *End point: PED and XED values*
- *Context:*
    - *Market for Jeans*

Introduction

The price elasticity of demand measures the responsiveness of a change in the quantity demanded due to a change in price, while the cross elasticity of demand measures the responsiveness of a change in the demand for good B due to a change in the price of good A.

Requirement 1 / Topic Sentence: There are several factors determining Price Elasticity of Demand.

Factor	Explanation

Availability and closeness of substitutes (presence of competition)	• *More substitutes available → more price elastic is the demand*
	    Reason: consumers can easily switch to other alternatives when the price of a good increases
	• *Fewer substitutes available → less price elastic is the demand*
	    Reason: consumers cannot find suitable replacement and are therefore not able to reduce its consumption when price rises
	    Example: When price of oil increases, its quantity demanded will fall less than proportionately relative to the increase in price, as there are not many close substitutes for oil as a source of energy (biofuel could be too expensive to be a good substitute).
	
	Closeness of substitutes
	• *The closer the substitutes are in terms of quality or brands, the more price elastic the demand is. (Even if there are only a few substitutes.)*
	    Reason: an increase in the price of one good will cause its consumers to quickly switch to its relatively close substitutes.
	    Example: Dasani mineral water and Ice Mountain mineral water are close substitutes. Consumers switch easily between them

	when there are changes in the price of either. Therefore demand is price elastic.
Percentage of income spent on the good	*Goods that take up a large proportion of a household's expenditure will cause consumers to be more sensitive to its prices. Thus these goods will have a more price elastic demand.* • *Example: When the price of a pack of mints rises from 25 cents to 35 cents, consumers are not likely to notice the 40% increase in the price and thus not likely to cut down their consumption very much. Thus demand is price inelastic.* • *The price elasticity of demand of a good is not the same for everyone as consumers of different income groups will have different price elasticity of demand for the same good.*
Nature of demand	• *Necessities tend to have more price inelastic demand, e.g. public transportation, especially for those who need them to travel to work. Staples such as rice is another example since consumers still have to consume them even if prices have increased. Essential medicines or medical services are also considered necessities as they are needed for the preservation of life.* • *Luxury goods tend to have more price elastic demand (e.g. Rolex watches, branded bags such as Prada and Louis Vuitton, Ferrari cars) as these can always be forgone if prices increase as they are not necessities.* • *Addictive goods tend to have very price inelastic demand, almost zero, (e.g. medicine, tobacco and alcohol) as consumers may find it difficult to change their habits despite price changes.*
Time period under consideration	• *The longer the time period under consideration, the more price elastic the demand for the good will be.* • *Price elasticity of demand tends to be greater in the long run (more price elastic) than in the short run (more price inelastic) as consumers have more time to search for alternatives and adjust their habits and consumption in response to price changes.* • *Example: Demand for oil during the early 1970s was more price inelastic (than today) because of the lack of efficient alternatives. Demand for oil today, while still price inelastic, can be said to be less price inelastic due to the presence of more energy substitutes like biofuel*

Note: You do not need all the factors above in the answer. 1 or 2 clearly identified factors explaining how PED will be influenced is sufficient.

Requirement 2 / Topic Sentence: There are also several determinants of cross elasticity of demand

Factor	Explanation

Relationship between 2 goods	• If the two goods are substitutes to each other, the XED value will be positive. • When price of good A (P_A) increases, it causes the demand for good B (Qdd_B) to increase. Likewise when price of good A (P_A) decreases, it causes the demand for good B (Qdd_B) to decrease. • Example: Starbucks vs. Coffee Bean. When the <u>price of a cup of Starbucks' latte decreases</u>, some consumers may switch from buying Coffee Bean's latte to Starbucks' latte if they perceive them as substitutes. Thus, <u>demand for latte from Coffee Bean decreases</u>. Assuming price of Coffee Bean's latte remains unchanged, demand will decrease. • If the two goods are complements to each other, the XED value will be negative. • When price of good A (P_A) increases, demand for good B (Qdd_B) decreases (arising from the fall in demand), i.e. P_A increases, Qdd_B decreases. Likewise, when P_A decreases, demand for good B increases. • Example: bread and butter, petrol and cars. When the <u>price of bread increases</u>, quantity demanded for bread may fall. Thus <u>demand for its complement, butter, falls</u>. • If the goods concerned are not related to each other, the XED value will be 0. E.g. demand for watches are not affected by changes in the price of burgers. • When price of good A (P_A) increases or decreases, the demand for good B (Qdd_B) remains unchanged.
Strength of relationship	• The closer the relationship between the two goods, the higher the XED (greater absolute value). This is because it shows that a price change of a good is able to cause a more than proportionate change in the demand for the other good. • As mentioned earlier, the magnitude of change will reflect how close these goods are as substitutes or complements.

Level	Descriptors	Marks
L3	• Well-developed explanation of factors <u>and</u> ability to use relevant examples to justify the differences in PED and XED between goods. • Both elasticity concepts accurately explained, well-illustrated using examples	8-10
L2	• Undeveloped explanation of factors that affect the PED and XED of goods • Examples are stated but not well-used in explanation.	5-7
L1	• Mere listing of factors; explanations are too brief and lack of examples	1-4

| | | • *Lack economic concepts **or** presence of major conceptual inaccuracies.* | |

(b) Assess the likely effects of a rise in price of one brand of jeans on the revenue earned by both retailers of that brand of jeans and those who sell other related goods. **[15]**

- *Command word: "discuss" requires a balanced perspective on whether increasing the price of one brand of jeans will increase and/or decrease the revenue of that firm and the seller of a related product, requires an evaluative insight*
- *Concept:*
  - *Start point: "rise in price of one brand of jeans"*
  - *End point: "revenue of that brand's retailer" and "revenue of another retailer"*
- *Context:*
 - *Market for jeans and a related good*

Require 1 / Topic sentence**: **The rise in the price of one brand of jeans would cause the revenue of that retailer to increase if the demand for that jeans is price inelastic.

("Factor" shifting demand or supply is not needed because this question's start point is a rise in price. We do not have to account for why price has risen, but simply take it as given in the question.)

Explain why a pair of jeans may have a |PED|<1:
The demand for some jeans, such as those sold by luxury brands or are in limited edition, have few effective substitutes since consumers perceive these jeans are having a unique brand or identity. Also, these jeans tend to be marketed to high-income consumers, and only take up a small proportion of their incomes. Hence, such jeans have a demand that is price inelastic [|PED|<1]. The price inelastic demand can be reflected by a demand with a steep gradient, as shown below.

Note, if the answer part (a) explains the determinants of PED contextualized to the market for jeans, it is possible to state that "some jeans may have |PED|<1, as explained in part a". You do not need to repeat that explanation.
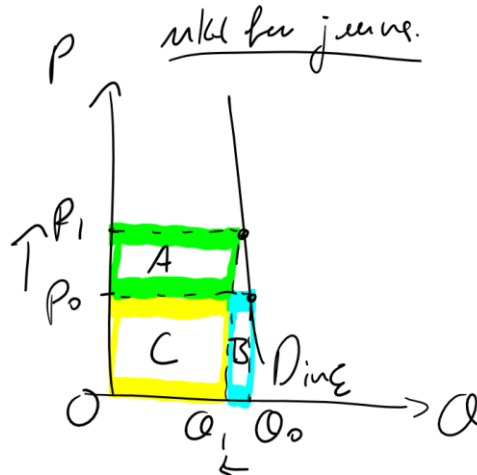
Interaction (Price Adjustment Process with PED): As price for such unique jeans increase (from P0 to P1), consumers are still relatively willing and able to consume these jeans, causing quantity demanded to fall only less than proportionally (from Q0 to Q1). The higher price implies that revenue would increase for each jeans that is being sold (Area A). However, as quantity demand has fallen, there is a loss of revenue given that fewer jeans are being sold (Area B). If, however, the demand is price inelastic, the gain in revenue would be larger than the loss in revenue.

Effect: Ultimately, the revenue of luxury or unique jeans retailers would increase from area C + B = P0xQ0 to area C + A = P1xQ1.

In-paragraph Evaluation: However, the above analysis may not apply for common jeans that do not have a strong product differentiation (e.g. branding, quality, or being in limited edition). These jeans are likely seen as being strong substitutes to other jeans. Hence, the demand for such jeans are likely to be price elastic instead. As price rise, quantity demanded for such jeans would fall more than proportionally since consumers would switch to cheaper alternatives. This implies that the revenue gained from higher prices of each unit being sold may therefore be less than the revenue lost from having much fewer units being sold. Hence, total revenue may fall instead for such retailers.
s

28
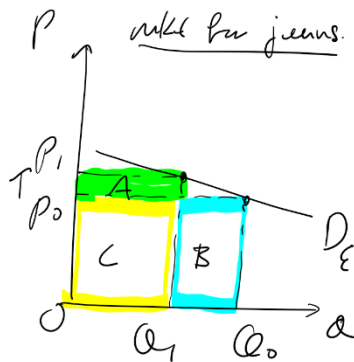
Requirement 2 / Topic sentence: *The increase in the price of one brand's jeans, however, may cause the revenue of a complementary good's retailer to decrease.*

Factors: *As the higher price of a brand's jeans results in a fall in quantity demanded for the jeans, consumers now also have less need for complementary goods such as belts. Since belts and jeans are typically consumed together, but jeans are being consumed less, the demand for belts would also fall. This is reflected by the XED value for jeans and belts being negative, where a rise in the price of good A (jeans) causes a fall in the demand for good B (belts). This is represented by a leftward shift of the demand curve for belts from D0 to D1.*
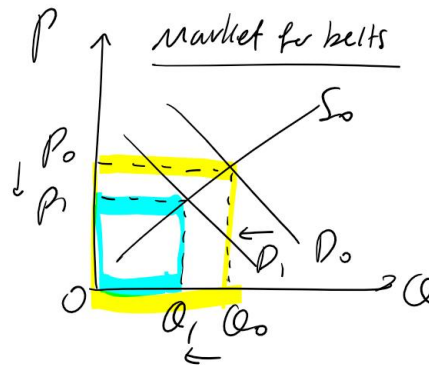
Interaction: *After the fall in demand, at the original price P0, there is now a surplus of belts. The surplus causes a downward pressure on the price of belts as producers try to clear their inventories. The fall in price causes quantity demanded to rise along the new demand curve and quantity supplied to fall along the supply curve. Price falls until the surplus is eliminated at the new equilibrium where price has fallen from P0 to P1 and equilibrium quantity has fallen from Q0 to Q1.*

Effect: *The total revenue has also fallen from P0xQ0 to P1xQ1.*

In-paragraph Evaluation: *However, the above analysis assumes no other changes in the demand and/or supply of belts. While the price of jeans is one factor affecting the demand for belts, it is not the only factor. If there is a period of strong economic growth where households experience higher incomes, the demand for belts could increase, assuming these belts are normal goods. These other possible factors may therefore mitigate the fall in the demand or even cause the demand to ultimately increase, despite the rise in the price of jeans. Therefore, the price, quantity and consequently revenue of belts may fall by a lesser extent.*

Evaluative conclusion

To conclude, whether or not a higher price of a brand of jeans results in higher revenue for its retailer depends on its uniqueness, and how it affects a related product depend on the nature of its relationship. However, both the nature of goods and the relationship between goods are also subject to change over time. Due to a change in culture (e.g. fashion), some goods which were once a time considered complements could possibly become independent goods or even substitutes in the future. Hence, the effects of the rise in price of a brand's jeans may also different in the short term and the long term.

Question 12 (2020 A Level Essay Question 2)

Concerns about future shortages of water resulted in Singapore's national water agency, PUB, increasing the price of water by 30% from 2017. By 2060, Singapore's total water demand could almost double.

(a) Explain why a shortage of water might still exist after the rise in the price of water
[10]

Question analysis

- *Command word: "explain", no need for a balanced perspective or evaluation.*
- *Concept:*
  - *Start point: "rise in price of water" and "demand for water double"*
  - *End point: "shortage persisting", quantity demanded greater than quantity supplied at the price set by PUB*
- *Context:*
  - *Singapore labour market*

Note: For most questions, the start point causes the end point. However, the first start point, "rise in price of water", does not cause the shortage. Rather, the question is asking why despite the rise in water, which was supposed to eliminate the shortage, would the shortage still exist. The second start point is more conventional, where the "demand for water doubling" is a cause for the shortage to persist.
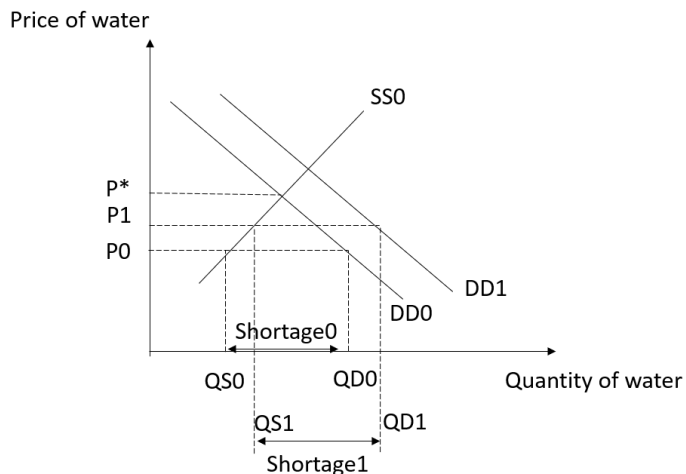
Requirement 1 / Topic sentence: **The high demand, low supply and government-set price of water in Singapore implies there was a shortage in the market for water at the original price.**

Factor (why demand is high): Singapore is a high-income country as reflected by the high GDP per capita. With affluence, the demand for water in Singapore is beyond just meeting basic needs. Water is demanded for more frequent eating, washing and cleaning, swimming pools for private housing, artificial landscaping like fountains and ponds. Singapore's industrial demand for water is also very high. Large volume of water is required for cooling towers and processing for our key industries like oil-refining industry, petrol chemical industry, wafer fabrication and semi-conductor production. These cause the demand for water in Singapore to be high, seen by a demand curve that lies far on the right.

Factor (why supply is low): Due to Singapore's small size, she generally lacks fresh water given the small size of rivers and lakes / reservoirs. This suggests the supply of water in Singapore is relatively low, shown by a supply curve on the far left.

Nature of water and government pricing: Furthermore, water is an essential good with no substitutes. Many necessary tasks require water, and even basic survival requires water. Hence, there is a strong equitable need to ensure that water is accessible by all residents in Singapore, regardless of income. To achieve this, the government sets a price of water (P0) that is lower than the free-market equilibrium price (P*) which would have allowed quantity demanded to equal quantity supplied.

30

Interaction / effect / Link: At the original price, P0, the quantity demanded exceeds the quantity supplied, implying there is a shortage (distance "shortage0") of water in Singapore.

Note: The entire "factor, interaction, effect" is the "explanation and examples" in the TEEL writing framework.

__Requirement 2 / Topic sentence__: __The increasing demand, PED and PES values of water causes the shortage to still exist after the rise in the price of water__.

Factor (demand): Given that water is a necessity for all residents living in Singapore, the growth in Singapore's population also implies a large increase in demand for water. This is seen through a rightwards shift in the demand curve.

PED / PES: Furthermore, the demand for water is likely to be price inelastic ($|PED|<1$) since it is essential with no viable substitute for it. The supply for water is likely to be price inelastic ($PES<1$) as well, since water cannot be stored in significant amounts for the long term and released whenever prices rise due to the small land space of Singapore.

Interaction: The price increase of 30% causes the quantity supplied to increase, but only by less than proportionally. Likewise, the rise in price also causes the quantity demanded to fall, moving along the new demand curve. However, quantity demanded also fall only by less than proportionally. Additionally, with increased demand, shown by a rightwards shift of the demand curve, the quantity demanded (Qd) still exceeds the quantity supplied at this new higher price (P*).

Effect / Link: Either to prevent a large increase in price for equitable reasons, or whether the government underestimated the increase in price needed for the market to clear, the shortage persists after the price increase. For the shortage to be completed eliminated, price has to increase more than 30%.

Level	Descriptor	Marks
L3	• *Answers that explain the initial shortage and why it persists with economic rigour*	8 - 10

31

	• *Answers / Examples given are relevant and contextualized to Singapore*	
L2	• *Answers that explain either the initial shortage or the persistence of the shortage only.* • *Answers lack the economic analysis, clarity and coherence* • *Examples given are somewhat relevant to Singapore*	***5 - 7***
L1	• *Listing of factors without economic explanation* • *Multiple inaccuracies in answers*	***1 - 4***

(b) Discuss whether the government policy of increasing the price of water is the only effective way to overcome future water shortages. [15]

Question analysis

- *Command word: "discuss" requires a balanced perspective on whether increasing price is the only way to eliminate the shortage or if there exist other effective ways, and requires an evaluative insight*
- *Concept:*
  - *Start point: "rise in price of water" and an alternative way for students to suggest*
  - *End point: "overcome shortage", quantity demanded equal to quantity supplied at the price set by PUB*
- *Context:*
  - *Singapore water market in future*

Introduction: A shortage exists when the quantity demanded for water exceeds the quantity supplied at the price water is being sold for.

*Requirement 1 / Topic sentence: **The policy of increasing the price of water is one effective way to overcome future water shortages**.*

Factor: The market for water in Singapore is not a free market. The government decides the price to set. The government has the ability, if it so wishes to, increase the price of water to clear the market.

Interaction / effect / Link: The increased price will cause quantity supplied to increase. This is because higher prices increase the profitability of supplying water, and producers of water becomes more incentive to supply water. Quantity demanded will also fall as consumers become less willing and/or able to consumer water at higher prices. As price rises, the rising quantity supplied and falling quantity demanded implies the shortage would be reduced. If price is increased sufficiently to point where quantity supplied is equal to quantity demanded at that price, the shortage would be fully eliminated. However, given that the demand for water is price inelastic, the rise in price would cause quantity demand to fall less than proportionally. Also, since supply is price inelastic, quantity supplied would

increase less than proportionally. Hence, for the increase in price to fully eliminate the shortage, the government must increase price sharply.

Note: The entire "factor, interaction, effect" is the "explanation and examples" in the TEEL writing framework.

In-paragraph Evaluation: *However, doing so may not be equitable since it might price out lower income households. This is especially harmful given the essential nature of water for basic survival and industrial use. In fact, water may be such an absolute necessity that the demand is almost perfectly inelastic. This means that below a certain level of water consumption, consumers are not able and/or willing to consume any less water even if prices increase. An increase in price would then not affect quantity demanded at all. This can be reflected by a vertical demand curve. This means that the only way to eliminate the shortage would be to increase price sufficiently for quantity supplied to increase. Given that the price increase required is likely to be very large, it is likely to deny low-income households access to water, an essential good. This would be highly inequitable.*

<u>**Requirement 2 / Topic sentence**</u>: **Other policies, such as educating residents in Singapore on the need to and manner to conserve water would also be viable to eliminate the shortage without further increasing the price of water**.
(Any reasonable policy to increase supply or reduce demand for water would be acceptable)

<u>*Factors*</u>: *Educating the residents in Singapore on the need and manner to conserve water would reduce the usage of water. This implies the demand for water will fall, shifting the demand curve left from D0 to D1.*
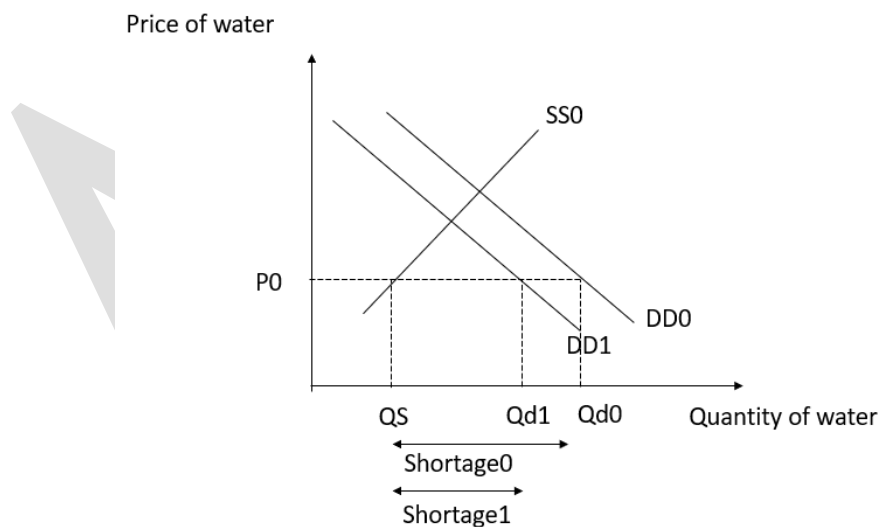
<u>*Interaction*</u>: *Despite not increasing price, the quantity demanded at the given price (P0) of water would fall, since the demand curve has shifted left (Qd0 to Qd1). Meanwhile, price remaining constant implies the quantity supplied is constant (Qs).*

<u>*Effect / Link*</u>: *Hence, the shortage, the difference between quantity demanded and supplied, would be reduced. Ideally, if the demand curve shifts left sufficiently, the shortage could be eliminated.*

33

In-paragraph Evaluation: Given that water is a necessity and that Singapore's population is rapidly growing, water conservation will only reduce demand to relatively small extent. This implies that the shortage may not be overcome entirely.

Evaluative Conclusion: Increasing price of water towards the market equilibrium price is an effective way to overcome water shortage as it will provide a more accurate signal to efficiently allocate resources to the water market and also to distribution of water to consumers. However, water being an essential and strategic good must be made accessible to all households rich or poor. Water for non-domestic uses should also be priced to reflect more accurately the market price of water. The practice of multi-pricing in the water market (domestic two-tier and non-domestic) will enable the government to continue increasing price of water to allow the market to efficiently overcome future water shortages but this should not be the only way. Whilst increasing price of water is necessary as determined by demand and supply forces, the government should also attempt to find ways to keep a reign on the rate of increase in demand in the future and at the same time invest in ways to increase future water supply. Working on both future demand and supply of water, the rate of increase in market equilibrium price of water will be managed to ensure that price of water in the future will remain affordable for households and at the same time, competitive for non-domestic uses so as not to erode cost competitiveness for firms operating in Singapore.

Level	Descriptor	Marks
L3	• *Answers that explain how an increase in price and one other policy can overcome the shortage with economic rigour* • *Answers / Examples given are relevant and contextualized to Singapore*	8 - 10
L2	• *Answers that explains __either__ the increase in price __or__ an alternate policy only.* • *Answers __lack__ the economic analysis, clarity and coherence* • *Examples given are somewhat relevant to Singapore*	5 - 7
L1	• *Listing of factors without economic explanation* • *Multiple inaccuracies in answers*	1 - 4

Question 13 (adapted from 2019 Promo Exam)

In recent years, young working parents have been complaining of a sharp increase in fees for childcare centres in Singapore. Operators of childcare centres attributed this sharp increase to manpower constraints and growing demand. To keep prices for childcare services affordable, the Singapore government has announced higher subsidies for families as well as lower monthly fee caps for all government-operated childcare centres.

(a) Explain why there is a "sharp increase" in fees for childcare centres in Singapore. [10]

Question analysis

- *Command word: "explain", no need for a balanced perspective or evaluation.*
- *Concept:*
  - *Start point: issues in preamble, "manpower constraints" and "growing demand"*
- *End point: "sharp increase in fees", Price increase*
- *Context:*
  - *Market for singapore childcare services*

*Requirement 1 / Topic sentence: **The abovementioned events caused a rise in demand and fall in supply, resulting in a sharp rise in childcare fees in Singapore.***

Factors (explaining the change in demand): Demand for childcare services in Singapore is likely to increase. This rise in demand is likely to be due to several factors like a rise in income and a change in tastes and preferences. Singapore has experienced good economic growth in recent years, leading to higher disposable income for households. The higher disposable income increases the purchasing power for households, hence leading to an increase in demand for childcare services. With increased government's efforts and campaigns to promote childbirth and starting families young, this could incentivize more young couples to have children early. This shift in tastes and preferences could lead to greater demand for childcare services as young parents need support to take care of kids.

Factors (explaining the change in supply): Supply of childcare services in Singapore is likely to decrease. This is largely due to the lack of manpower (teachers). With a shortage of teachers, there is an upward pressure on wages, causing a rise in labour cost. Since labour is a factor of production, this increases the cost of childcare services. This shifts the curve for childcare services to the left.
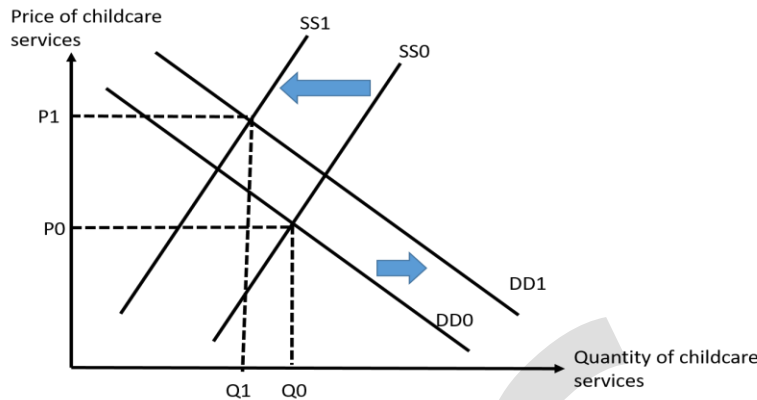
Interaction (getting from the initial to the new equilibrium through the price adjustment process): As seen from the diagram above, the increase in demand and a fall in supply would create a shortage at the original price level P0. This shortage creates an upward pressure on price for childcare services, leading to the price increase until it reaches to the new equilibrium at P1.

Effect / Link: Given that both the rise in demand and fall in supply would lead to a shortage and cause price to increase even if they occurred independently, both shocks occurring together results in an even larger shortage, requiring price to increase by a large extent. Assuming the supply decreases to a greater extent than the increase in demand, quantity of childcare services falls.

Note: The entire "factor, interaction, effect" is the "explanation and examples" in the TEEL writing framework.

Requirement 2 / Topic sentence: The price inelastic demand and supply also resulted in a sharp rise in childcare fees in Singapore.

PED and PES value and reason: The demand for childcare services is likely to be relatively price inelastic as there is a lack of close substitutes to childcare services. A close alternative is family support, which not all households have the privilege to enjoy. The supply of childcare services is also relatively price inelastic due to the long production time it takes to establish a childcare centre, such as time taken to apply for license and hiring of trained childcare educators.

Interaction (getting from the initial to the new equilibrium through the price adjustment process): As explained above, the demand and supply shocks resulted in a shortage in childcare services at the original price. |PED|<1 implies that the rise in price resulting from the shortage leads to a less than proportionate fall in quantity demanded, while PES<1 implies the rise in price leads to a less than proportionate fall in quantity supplied. Hence, the shortage will still persist with a small increase in price. This means that price will continue to increase until the shortage is fully eliminated.

Effect / Link: This induces a sharp increase in price to clear the shortage fully.

Level	Descriptor	Marks

L3	• *Answers that give at least one demand __and__ supply factor that contributes to the increase in price for childcare services.* • *Answers that explain clearly and accurately how the rise in demand and a fall in supply lead to the sharp price increase (both direction and magnitude)* • *Answers / Examples given are relevant and contextualized to Singapore*	*8 - 10*
L2	• *Answers that give __either__ one demand __or__ supply factor that contributes to the increase in price for childcare services.* • *Answers __lack__ the economic analysis, clarity and coherence* • *Examples given are somewhat relevant to Singapore*	*5 – 7*
L1	• *Listing of factors without economic explanation* • *Multiple inaccuracies in answers* • *__Not__ contextualized to Singapore*	*1 – 4*

(b) Discuss whether increasing subsidies is better than setting a cap on school fees in keeping prices for childcare services affordable in Singapore. **[15]**

Question analysis

- *Command word: "discuss" requires a balanced perspective on whether setting a cap on fees is the best way to keep prices affordable, and requires an evaluative insight*
- *Concept:*
  - *Start point: "cap on school fees" and an alternative way for students to suggest*
- *End point: "affordability", lower price*
- *Context:*
  - *Market for childcare services in Singapore*

Introduction:
Government aims to keep prices for childcare services low, as childcare services can be seen as an essential service for young and working parents. There are several policies the government can adopt to keep prices low, as mentioned in the question, like subsidies, price control and increasing the supply of childcare centres.

Requirement 1 / Topic sentence: Increasing subsidies are an effective way to lower the price of childcare services, thus maintaining affordability.

*Factors (explaining the change in supply): Government can **increase** subsidies for government-aided childcare services. Subsidies can be provided in various ways. One such way is for the Government to subsidize the cost of operations, for example, by paying a portion of childcare teachers' wages. This reduces the cost of production, shifting the supply curve of childcare services to the right. Subsidies can also be given directly to households, where the government pays a portion of the final cost of childcare services. Such subsidies are already in place in Singapore, can be increased even further more (i.e. the government can bare a larger portion of the childcare fees). This reduces the prices childcare centers are willing and able to receive from consumers since the government will pay the remaining fees such that childcare centers still receive the same unit revenue at each quantity of service provided. This is reflected also through a rightward shift in the supply curve.*

Interaction (getting from the initial to the new equilibrium through the price adjustment process): With the increase in supply, this creates a surplus at the original price level (P0), exerting a downward pressure on price.

Effect / Link: This reduces prices to P1. In this way, increase in subsidies can help to keep prices for childcare services affordable.

Note: The entire "factor, interaction, effect" is the "explanation and examples" in the TEEL writing framework.

In-paragraph Evaluation: However, increase in subsidies will add on more burden to the government budget. This is especially so when the Singapore government faces many competing needs for its budget, like healthcare, housing and public transport areas. An increase in subsidies on childcare services would lead to a higher opportunity cost to the Singapore government. In this aspect, government cannot increase subsidies infinitely into the long-term. One way the government can overcome this limitation of opportunity cost is to peg the amount of subsidies given to income levels, by allowing the poor and lower-income families to enjoy a higher proportion of subsidies. In this way, the amount of subsidies given can be reduced, as opposed to equal subsidies are given to all consumers. However even with tiered subsides, an increase in subsidies may not necessarily be sufficient for the low-income families, with single or even unstable income levels. As a result, increase in subsidies alone is not sufficient to keep prices low and affordable for the low-income families.

Requirement 2 / Topic sentence: Setting a price cap on fees is also an effective way to lower the price of childcare services.

Factors (government regulation): A price cap is effectiveness a price ceiling, which is a price childcare centers cannot legally charge their services above. This price (P max) would be determined by the government, and likely to be set below the current market equilibrium price P1).
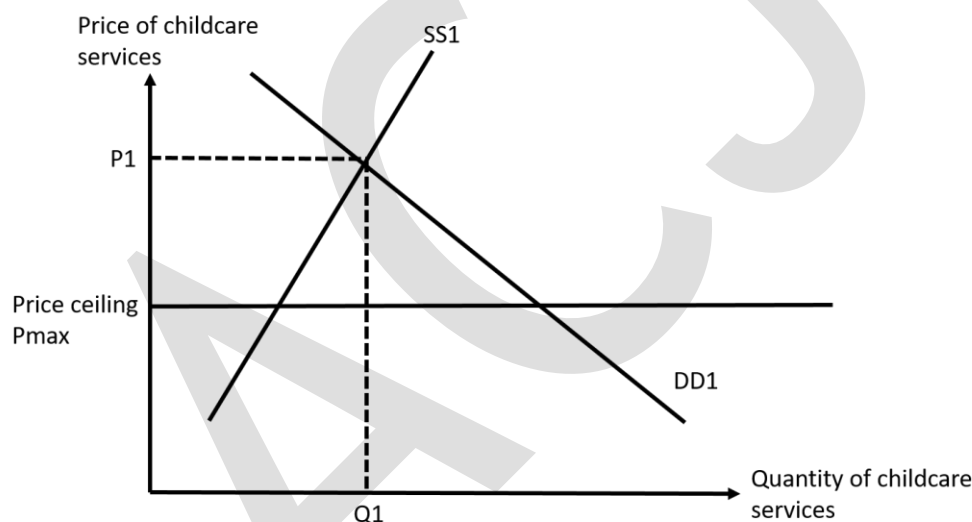
Interaction (getting from the initial to the new equilibrium): Even though the quantity demanded exceeds the quantity supplied at this price cap (P max), resulting in a shortage, price cannot increase to eliminate the shortage since the government does not allow firms to do so.

Effect / Link: Hence, the price cap will now become the new equilibrium price.

In-paragraph Evaluation: *Price ceiling essentially distorts the markets, creating a perennial shortage in the market, where the quantity demanded at is always larger than the quantity supplied at the price ceiling. This implies that some consumers who want the service, and who are also willing and able to pay for it, will not be guaranteed the service. The government then must decide how to allocate the services, example through balloting, first-come-first-serve, or rationing. However, these may not allow those who need the service the most to receive it,*

potentially worsening equity. The distortion to the market can lead to resources not being allocated efficiently, worsening the society's welfare. With price ceiling, consumer surplus is increased at the expense of the producers.

***Evaluative conclusion**: Increasing subsidies and price controls could be seen more as short-term measures, intending to reduce prices temporarily, while the government focuses on building more childcare centres in the meantime. When these policies are implemented together, the prices can be reduced steadily and maintained at an affordable rate in the long-term. As Singapore has a small population and high literacy rate in the workforce, it is likely that young parents would prefer to continue working, rather than be stay-at-home parents. Therefore, in view of the rising need for childcare services in Singapore, it is crucial that the government would have to allocate more budget and resources to build more childcare centres so that these services can be afforded by its people.*

Level	Descriptor	Marks
L3	• *Balanced and well-developed answers that discuss subsidies and **two other** policies that contributes to the reduction in price for childcare services (including limitations)* • *Clear diagrams drawn and explained* • ***High quality answers should demonstrate some comparative explanations between the policies as well as the "increase" in subsidies, rather than just subsidies alone.***	***8 - 10***
L2	• ***One-sided** answers that do not consider the limitations of the policies explained* • *Balanced but **inadequate** scope in answers, e.g. **only subsidies** is explained and considered limitations.* • *Answers may **lack** accurate economic analysis, clarity and/or coherence*	***5 – 7***
L1	• *Listing of policies without economic explanations* • *Several inaccuracies in answers* • *Not contextualized to Singapore*	***1 – 4***