The consumption of sugary beverages is linked to health issues like obesity, diabetes, and dental problems, impacting both individuals and society. Challenges in accessing accurate information about these risks exacerbate the problem. To address this, Singapore's Ministry of Health introduced Nutri-Grade labeling and advertising restrictions in December 2023. This system assigns grades from A to D, with D indicating the highest sugar content, aiming to reduce sugar intake and shape consumer behavior in the long term.

(a) Explain **two** reasons why there may be an inefficient allocation of resources in the market for sugary beverages. [10]

Question interpretation			
Command word	Explain two reasons	Elaborate <u>why</u>	
Content required	Inefficient allocation of resources which does not optimize society's welfare	Market failure	
Context	Market for sugary beverages	"impacting both individuals and <i>society</i> " - Negative externalities "Challenges in accessing accurate information about these risks exacerbate the problem" - Imperfect information	
Approach:	<ul> <li>R1: Explain how negative externalities arising from the consumption of sugary beverages lead to market failure.</li> <li>R2: Explain how imperfect information about the consumption of sugary beverages lead to market failure.</li> </ul>		

Part (a)

# Suggested answer

ouggested and	5000	
Introduction	Market failure is said to occur when free markets, operating without government intervention, fail to deliver a socially- efficient allocation of resources and hence economic welfare is not maximized.	Define key terms
	Consumption of sugary beverages may generate negative externalities, which leads to market failure. At the same time, individuals may also have imperfect information about the true benefits of consuming these goods, which also contributes to market failure. In this essay, I will explain why negative externalities from the consumption of sugary beverages and imperfect information about these beverages will result in an inefficient allocation of resources in this market.	Overview
Body – R1: Negative externalities in consumptio n	In the consumption of sugary beverages, consumers consider only their marginal private cost (MPC) and marginal private benefit (MPB). The MPC of consuming an additional unit of sugary beverage includes the cost of the drink itself as well as the increase in medical expenditure from the possible development of health issues in oneself, such as obesity, diabetes, and dental problems. The MPB of consuming an additional unit of sugary beverage is perhaps the increase in wages as a result of higher productivity in the workplace as a result of stress relief that such beverages may give. Rational	Explain private equilibrium

	and self-interested consumers will consume $Q_P$ amount of sugary beverages where MPB = MPC, the private equilibrium level, to maximise their net benefit.	
	But over and above this private cost, the consumption of sugary beverages places an additional cost on third parties who are not directly involved in the market transaction, i.e. it generates marginal external cost (MEC). Increased prevalence of obesity and diabetes, for example, leads to higher healthcare expenditures, not only for individuals but also for the government, who usually subsidizes healthcare in a country.	Contextualis e negative externality
	The existence of the MEC raises the marginal social cost (MSC) above MPC. Considering the full cost of consuming sugary beverages to the society as a whole, the socially	Explain the divergence
	optimum output should only be $Q_S$ , where MSB = MSC, to maximise societal welfare. But consumers, acting in pursuit of their self-interest, disregard the external cost and consequently consume at $Q_P$ . Due to this over-consumption, society has to bear a cost (area $Q_S caQ_P$ ) that is in excess of	Explain socially optimal equilibrium
	the benefits (area $Q_S cbQ_P$ ) derived from the additional units of sugary beverages consumed, giving rise to a welfare loss or deadweight loss of area abc.	Derive DWL
	\$ MSC = MPC + MEC	
	MPC	
	MPB = MSB (assume MEB = 0)	Diagram
	Qs Qp Quantity of sugary beverages	
Body – R2: Imperfect information	At the same time, consumers may also have imperfect information about the actual benefits they receive from the consumption of sugary beverages. This is because there are challenges in accessing accurate information about the associated health risks from consuming too much sugary beverages. Consumers may not know what is the optimal amount of sugar they can and should consume a day, and they also may not know exactly how much sugar their	Contextualis e the imperfect information
	they derive from an additional unit of sugary beverage consumed.	Explain the divergence
	In the free market, consumers would consume at $Q_P$ , where their MPC = perceived MPB. However, if they had perfect information about what their actual MPB was, they would have consumed at $Q_S$ , where MPC = actual MPB to maximise their utility. As a result, there is overconsumption by the	Explain the private and socially optimal equilibrium



Note: Students may also illustrate imperfect information as a divergence between actual and perceived MPC.

L3	Answer is relevant and is able to explain briefly how negative externalities AND imperfect information lead to market failure. There is good use of examples and well- drawn diagrams in support of answer. Two reasons well explained (externalities + imperfect info) – L3 – 10m One reason well explained (externalities) + one cursorily developed (imperfect info) – L3 – 8 or 9m	8 – 10
L2	Answer is relevant and is able to explain briefly how negative externalities AND imperfect information lead to market failure. There is some errors present in explanation/use of diagram. There is some attempt to use examples in support of answer. One reason well explained (externalities) – L2 – 6m One reason well explained (externalities) + one other reason <u>severely</u> undeveloped (imperfect info) OR both reasons cursorily explained – max L2 – 7m	5 – 7
	Teasons cursonly explained - max Lz - 7m	
L1	Answer is irrelevant and/or there are gross conceptual errors in the explanation of how negative externalities and imperfect information lead to market failure. Answer	1 – 4

displays no awareness of context and there is little/no	
attempt to use a diagram.	

#### Examiners' Comments

## Part (a)

This part of the question is relatively well done, with majority of students providing responses that reflect a L3 standard. However, there are still two main areas for improvement:

Firstly, since the negative externality is generated from the *consumption* of sugary beverages, the analysis of how the market for sugary beverages fails should be done from the perspective of *consumers*, not producers. Appropriate examples of the private costs, private benefits, and external costs/benefits should be provided. Weaker responses either had unclear examples of external costs (e.g., link to a third party was unclear or lacking), or had conceptually incorrect examples. The marginal analysis should be made explicit (i.e. students should highlight that MPB/MPC is the benefit/cost derived/incurred from 'an additional unit of the good' consumed').

Secondly, students should note that they need to go beyond merely identifying the areas of deadweight losses for society - they should be able to *derive* these areas, clearly analysing and explaining how they arrived at these areas as deadweight losses.

(b) Discuss whether the Nutri-Grade labelling is the best way to ensure an efficient allocation of resources in this market. [15]

Question interpretation			
Command word	Discuss whether Multiple perspectives on an issue – examining the advantages and		
		disadvantages of different policy	
		measures	
Content required	Best way ensure an efficient allocation of resources	Government policy measures to achieve Qs: - Command-and-control policies: legislation to mandate information disclosure, e.g. Nutrigrade labelling, banning - Market-based policies: Indirect taxes, e.g. sugar tax, moral	
-		suasion	
Context	In this market	Market for sugary beverages	
Approach:	<ul> <li>R1: Explain how imperfect informa limitations</li> <li>R2: Explain how c improve resource</li> </ul>	w Nutri-Grade labelling work to tackle tion and improve resource allocation + its one other measure (e.g. sugar tax) works to allocation + its limitations	
	The requirements of at least <b>two po</b> - Nutri-Grade m - Sugar tax - Moral suasion - Ban	are for an analytically-based explanation <b>licies</b> which are expected to include: neasures (a form of legislation)	

## Part (b)

<ul> <li>EV: Well-argued evaluative judgment should be made about which is the best policy to ensure an efficient allocation of resources (e.g. ranking of policies using an explicit criteria). Students may also recognize that governments may also suffer from information failure and that this may influence the judgement on the best policy.</li> </ul>
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#### Suggested answer

Introduction	As established in part (a), consumers not only have imperfect information about the true benefits of consuming sugary drinks, but the consumption of such drinks also generate negative externalities. Hence this leads to market failure, where there is an inefficient allocation of resources and society's welfare is not maximized.	Define key terms
	In response to this, governments such as that of Singapore's have put in place measures such as Nutrigrade labelling, which is a legislation to mandate information disclosure. Besides this measure, governments can also consider using sugar taxes, or moral suasion, to reduce consumption of sugary beverages in their countries. In this essay, I will discuss the advantages and disadvantages of these policies before discussing if Nutrigrade labelling is indeed the best way to ensure an efficient allocation of resources in this market.	Overview
Thesis	Nutrigrade labelling, which is a form of legislation to mandate information disclosure, can be a good way to ensure an efficient allocation of resources in this market.	Thesis statement
	By mandating information disclosure (nutrition label) and prohibiting advertisements which raise the appeal of Nutri- Grade D drinks to consumers, the government seeks to reduce the MPB <sub>perceived</sub> , shifting it closer towards MPB <sub>actual</sub> , and hence move the private equilibrium output towards the	Explain how the policy works to achieve Q₅
	socially-optimal output. Consumers not only know how much sugar is contained within their beverages, but also how much sugar is optimal for them, through the easy-to-understand labelling system that categorises drinks with no sugar as A- grade, and drinks with the highest level of sugar as D-grade.	Contextualisation
	Benefit / Cost(\$) / MPC = MSC (assume MEC = 0)	
		Diagram
	$O \qquad Q_{S} \leftarrow Q_{P} \qquad Q_{S} \qquad Q_{S} \qquad Q_{P} \qquad Q_{S} \qquad $	

	In addition to simply mandating information disclosure, the government also mandates that the relevant information be presented in an easy-to-understand manner, and prominently displayed. This is to tap on the saliency bias. Rather than just presenting the sugar and saturated fat content in numerical values, the information is simplified into 4 grades, and colour-coded: Grade A, corresponding to the lowest sugar and saturated fat thresholds, is in green. Grade D, corresponding to the highest sugar and saturated fat thresholds, is in red. Additionally, beverages graded "C" or "D" must be labelled with a Nutri-Grade mark on the front-of-pack of its package for pre-packaged products or labelled next to beverages listed for sale, such as on physical or online menus at their point of purchase.	Advantage – Tapping on consumers' saliency bias (Tutors to note application to BE)
Anti-thesis 1	Nutrigrade labelling may not be a good way to ensure an efficient allocation of resources in this market due to its limitations.	Counter- argument
	Since consumers can decide how they want to respond to the information provided, this makes the outcome of the policy highly uncertain. Indeed, given emerging new evidence that sugar may well be potentially as addictive as nicotine, drugs and alcohol, it is highly likely that nutrigrade labelling, on its own, will not be able to achieve an efficient allocation of resources since consumers may be addicted to sugary drinks and may lack self-control.	Limitation 1: Uncertain outcome
	Additionally, the provision of information about the sugar content in drinks does nothing to resolve the market failure stemming from negative externalities. Hence, there is a need for governments to consider other policies that can be implemented to ensure an efficient allocation of resources in this market.	Limitation 2: Does not address negative externalities
Anti- Thesis 2	Nutrigrade labelling may not be a good way to ensure an efficient allocation of resources in this market as there may be other methods, such as a <u>sugar tax</u> .	Anti-thesis statement
	When faced with negative externalities, the government may choose to impose an indirect specific tax that is equivalent to the value of the marginal external costs (MEC) generated at the socially optimum level of output. The indirect tax, imposed on producers but partially passed on to consumers in the form of higher prices, gets consumers to "internalise" the external cost in their decision-making since the indirect tax equal to <i>ab</i> per unit of output increases the consumers' marginal private cost of consumption, shifting the marginal private costs (MPC) upwards to MPC <sub>1</sub> . The new private optimum level of output occurs at $Q_P$ ' where MPC <sub>1</sub> = MPB, down from the original private equilibrium output $Q_P$ where MPC <sub>0</sub> = MPB.	Explain how the policy works to achieve Q <sub>s</sub> + reference to diagram
		Diagram



	the MPC to MPC <sub>1</sub> . In this instance, the tax reduces the extent of over-consumption and the size of the deadweight loss (from area <i>ade</i> to area <i>abc</i> ) without fully correcting the problem. Conversely, the government could have over-estimated the MEC and impose a tax of <i>fh</i> per unit, shifting the MPC to MPC <sub>2</sub> . Given the new MPC, the private equilibrium output falls to $Q_2$ where MPC <sub>2</sub> = MPB. There is now an under- consumption of the good. The tax in this instance moves the market from a point of over-consumption ( $Q_sQ_0$ ) to under- consumption ( $Q_2Q_s$ ). This could actually worsen the inefficiency if the deadweight loss from under-consumption (area <i>aij</i> ) due to government intervention > the initial deadweight loss from over-consumption (area <i>ade</i> ) due to market failure. The effectiveness of indirect taxes in achieving the socially efficient quantity of sugary beverages is also highly uncertain as it depends on its PED. As mentioned earlier, given the addictive nature of sugary drinks, its demand may also be highly price inelastic since consumers may find it difficult to switch to other beverages. Hence, an indirect tax that raises consumers' MPC are unlikely to reduce consumption to the socially optimal level, unless the per-unit tax is very high. High tax rates may be politically unpopular.	Limitation 2: Demand for sugary drinks may be price inelastic
	Nutrigrade labelling may not be a good way to ensure an efficient allocation of resources in this market as there may be other methods, such as <u>moral suasion</u> .	Anti-thesis statement
	The government may use moral suasion to change people's attitudes and behaviours by urging them to "do the right thing" through appealing to their civic and ethical responsibilities. Government efforts to portray certain behaviour as prosocial and others as socially-unacceptable can nudge households and firms towards certain desired behaviour. For instance, governments can further strengthen healthy-eating campaigns by highlighting the impact on overall healthcare cost borne by the whole society when there is an excessive consumption of sugary beverages.	Explain how the policy works to achieve Q <sub>s</sub>
	Such campaigns, if effective, will lead to a long-term change in behaviour as consumers <b>voluntarily take into account the</b> <b>negative externalities associated with their actions</b> , which increases their MPC towards MPC <sub>1</sub> enabling them to consume sugary drinks at the socially efficient level $Q_s$ .	
	However, moral suasion works by changing mindsets which is key to bringing about enduring change. The problem, however, is that mindset change takes time. Hence, this policy is likely to show its effectiveness in the long run.	Limitation
Synthesis	<b>[Stand]</b> In the market for sugary beverages, Nutrigrade labelling alone is not the best way to ensure an efficient allocation of resources.	Stand/ Summative conclusion

<ul> <li>[Substantiation] This is because there are two sources of market failure in this market, and the provision of information only resolves the root cause of one of them, which is imperfect information. Furthermore, we have already established that even with the provision of Nutrigrade labelling, it is still possible for consumers (especially those who are addicted to drinking sugary beverages) to ignore these labels and not change their consumption patterns at all. Hence, a better approach could be to adopt a combination of policies: <ul> <li>In the short run, a sugar tax on sugary beverages is necessary to force consumers to internalize the negative externalities and to reduce their consumption. At the same time, the government should continue with the mandate for firms to disclose necessary nutritional information associated with their beverages via Nutrigrade labelling, and to engage in moral suasion to persuade consumers to voluntarily internalize the negative externalities.</li> <li>In the long run, once such messages have set in and consumers' mindsets have changed permanently with regards to sugary beverages, the sugar tax may be gradually removed.</li> </ul></li></ul>	<ul> <li>Substantiation <ul> <li>Does not target root causes</li> </ul> </li> <li>Not effective in achieving Qs</li> <li>Some policies take a long time to have an effect</li> </ul>
[Something Special] In the case of Singapore, we are in a minority of nations with no tax on sugar-sweetened drinks. This could be due to equity concerns, since a sugar tax will increase the price of such beverages and affect lower-income families more since it will represent a proportionally higher share of a low-income families' expendable income than those of the rich. With recent complaints in Singapore about the rising cost of living, the Singapore government has opted for a softer approach of simply encouraging residents to opt for lower-sugar drinks, instead of a 'hard' approach like a tax or a ban. Hence, whether a policy is the 'best' policy for a country also depends on its current situation, as well as its current priorities.	Something special – explaining other factors that may affect the government's decision of which is the best policy

Note1: Students may also explain and evaluate the potential limitations of a sugar ban. Note2: Prior to the implementation of Nutrigrade labelling, the Singapore government conducted a public consultation about ways to reduce consumption of sugary beverages. You may click HERE to find out more about the results of this public consultation.

#### LORMS

L3	Answer is two-sided and explains at least two policy	8 – 10
	measures. Answer is able to show how policies can ensure	
	an efficient allocation of resources in this market. There is	
	good use of examples as well as good reference to	
	accurately-drawn diagrams.	

	Two policies well explained (legislation to mandate information disclosure – for imperfect information + indirect taxes/moral suasion/ban – for negative externalities) – L3 – 10m One policy well explained (legislation to mandate information disclosure – for imperfect information) + one cursorily developed (indirect taxes/moral suasion/ban – for negative externalities) – L3 – 8 or 9m	
L2	Answer is relevant and is able to explain how <u>any one policy</u> may ensure an efficient allocation of resources in this market. There is some errors present in explanation/use of diagram. There is some attempt to use examples in support of answer. Answer may be one-sided (i.e. answer may not have considered the limitations of policy measures) – max 7m	5 – 7
	One policy well explained (legislation to mandate information disclosure – for imperfect information) – L2 – 6m One policy well explained (legislation to mandate information disclosure – for imperfect information) + one other policy <u>severely</u> undeveloped OR both policies cursorily explained – max L2 – 7m	
L1	Answer is irrelevant and/or there are gross conceptual errors in the explanation of how policies may achieve an efficient allocation of resources in this market. Answer displays no awareness of context and there is little/no attempt to use diagrams.	1 – 4

E3	<ul> <li>Well-substantiated judgment with use of at least two criteria to justify judgment. There is an attempt to examine the validity of unstated assumptions made and/or attempt to contextualise the conclusion.</li> <li>Award 5 for a well-explained evaluative judgment about both requirements PLUS a summative conclusion leading to a well-explained evaluative judgment about which, in any, is the best policy (so far as required by the question).</li> </ul>	5
E2	Well-substantiated judgment with use of at least two criteria to justify judgment. Award 3 for a well-explained evaluative judgment about one requirement PLUS a 'learned' evaluative statement for the second OR	3 – 4*
	Award 3 for a well-explained evaluative judgment about one requirement PLUS a 'learned' evaluative statement for the second PLUS a summative conclusion – one that	

	gives additional evaluation and not one that is a repetition of evaluation given earlier. Award 4 for a well-explained evaluative judgment about both requirements	
E1	Substantiated judgement but substantiation may be largely rehashed from earlier analysis, or there is use of only one criterion to justify judgment	1 – 2*
	Award 1 for a 'learned' evaluative statement for one requirement	
	Award 2 for a 'learned' evaluative statement for two requirements OR a well-explained evaluative judgment about one requirement	

### Examiners' Report

### Part (b)

Generally, students were able to identify and explain at least two policies aimed at resolving the market failure in the market for sugary beverages, to varying degrees of success. The overall evaluation of policies, however, was much more limited and often does not address the question directly.

Most students were able to explain how the provision of information through Nutrigrade labelling was able to close the information gap that consumers had, by reducing or eliminating the divergence between consumers' perceived and actual MPB of consuming an additional unit of sugary beverage. In selecting an alternative policy, stronger responses focused on alternatives that could contrast well with Nutri-Grade labelling such as indirect taxes. This allowed for a more varied and deeper discussion when comparing the policies. Alternative policies highlighted included a sugar tax, or a ban on beverages containing sugar that exceeds a certain pre-determined level. Explanation of these policies were generally detailed and supported with well-drawn diagrams that clearly showed how the socially optimal quantity of sugary beverages would be achieved with the aid of these policies.

Weaker answers made no reference to any supporting diagrams nor clearly explained how Nutrigrade (or the other policy) resolved the deadweight loss. Weaker answers also seemed to be contradictory in its presentation. For example, it would begin with "*Nutrigrade is the best policy because…*" and after that, begin the next segment with "*a sugar tax is the best policy because…*" hence the student needs to work on how to present the answers - which is to first discuss both sides and then bring in the stand later on. Weaker responses selected alternatives which were very similar to Nutri-Grade labelling such as public education, which limited the scope of discussion.

The evaluation of policies also had more room for improvement. In particular, many students directly recommended a combination of policies without first addressing the question of whether Nutrigrade labelling was the best policy. There was also a limited attempt to compare the policies according to a common explicit criteria. A number of students had arguments that were quite convoluted: first arguing that Nutrigrade labelling addressed the market failure arising from imperfect information, and that a sugar tax addressed the market failure arising from negative externalities, then concluding that one is better than the other *because it can* 

*help achieve an efficient allocation of resources in the market* - even though there are two distinct sources of market failure!