

Markscheme

November 2022

Economics

Higher level

Paper 3

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Notes for examiners:

- 1. Whenever relevant, carry over marks must be awarded. If a candidate makes an error in calculation, but then uses the incorrect figure appropriately and accurately in later question parts, then the candidate may be fully rewarded. This is the “own-figure rule” and you should put OFR on the script where you are rewarding this.
- 2. Alternative approaches may be taken in responses to the [4] questions that use A02 command terms. If this is the case and the alternative approaches are valid, then full credit should be given.
- 3. A candidate may be penalized for not rounding correctly, failing to give answers correct to 2 dp or, in some cases, for not including the appropriate units. However, a candidate may only be penalized ONCE per script for each type of error.

- 1. (a) (i) Determine the missing cost figures and insert your answers in **Table 1**. [2]

Meals prepared per hour	Average cost (US\$)	Total cost (US\$)	Marginal cost (US\$)
14	7.25	101.50	–
15	7.20	108	6.50
16	7.19	115.04	7.04

For 3 correct figures [1]

For 4 correct figures [2]

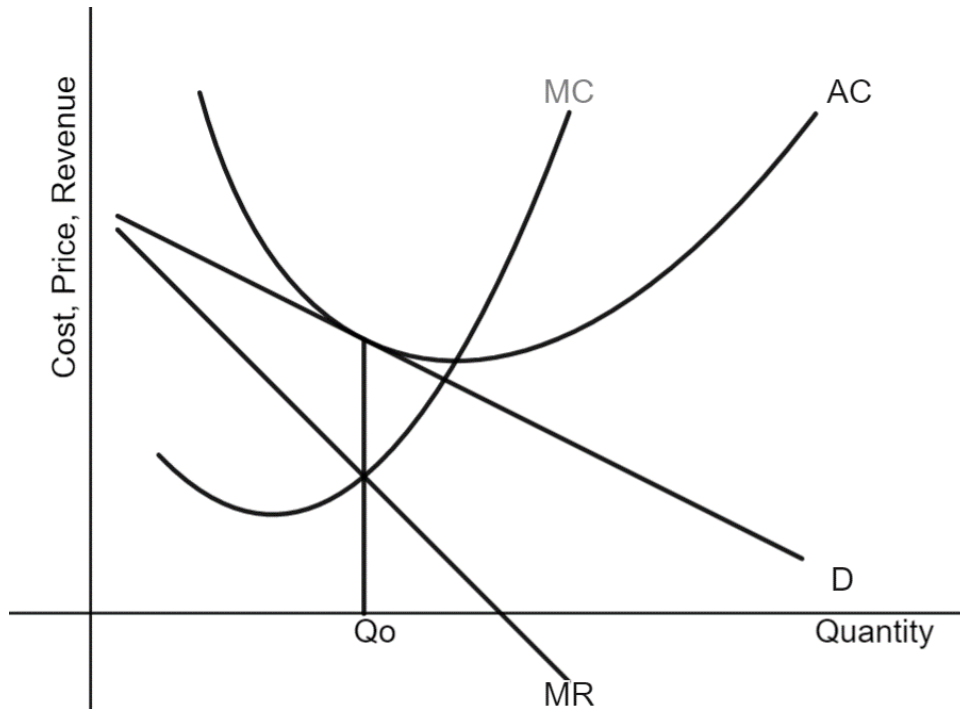
OFR applies (e.g. if TC(15) incorrect but AC(15) is then calculated via TC/Q. Also if TC(16) is incorrect but MC(16) is calculated via TC(16) – TC(15).

- (ii) Assuming that this catering market is in long run equilibrium, sketch a diagram in which the profit-maximizing level of output for a firm in this market is shown. [2]

For a negatively sloped D (AR) tangential to AC [1]

For the point of tangency being vertically above the profit maximizing output where MR and MC intersect [1]

A response with missing or incorrect labels or without MC intersecting minimum AC may be awarded a maximum of [1]



The vertical axis may be labelled Cost (C), Price (P) or Revenue (R). The horizontal axis may be labelled Quantity (Q) or Output. AC may be labelled ATC. A title is not necessary.

- (iii) Using **Figure 1**, calculate the change in the consumer surplus resulting from this government intervention. [2]

$$\text{Initial CS} = (4 - 2.4) \times 16 \times 0.5 = 12.8$$

$$\text{Final CS} = (4 - 2.8) \times 12 \times 0.5 = 7.2$$

Any valid working is sufficient for [1]

$$\text{Change in CS} = 7.2 - 12.8 = - \$5600 \text{ (or, a decrease) [1]}$$

*An alternative approach with valid workings should be fully rewarded.
eg Change in CS = $0.5 \times 0.4 \times (12 + 16) = \$5\,600$ (decrease)*

For full marks to be awarded the response must provide valid working, specify the decrease and include correct units.

- (iv) With reference to **Figure 1**, explain how the price floor will impact on allocative efficiency in the market for tomatoes. **[4]**

Level		Marks
0	The work does not meet a standard described by the descriptors below	0
1	The written response is limited.	1–2
	<ul style="list-style-type: none"> The market equilibrium moves away from $D = S$ ($MB = MC$) / OR excess supply is created [1] So allocative efficiency is no longer achieved because of overproduction (OR that social surplus is not maximized) [1] 	
2	The written response is accurate	3–4
	<p>For an explanation that allocative efficiency requires that (for the last unit produced) price is equal to marginal cost [1] which was the case when output was 16000 kilograms where $P=MC= US\\$2.4$ (OR where $MB = MC$). [1]</p> <p>However, as a result of the price floor, 4000 kg (or, units) more are produced and for the last unit (20 000) price (US\$2.80) is greater than MC (US\$2.00). [1] and therefore allocative efficiency is no longer achieved [1]</p> <p>Candidates who do not make reference to the diagram may be awarded a maximum of [3].</p>	

A valid alternative approach is to calculate the welfare loss resulting from the price floor

$$\text{Change in CS} = -5600$$

$$\text{Change in PS} = 0.5 \times 0.4 \times (16 + 20) = 7200 \text{ [1]}$$

$$\text{Change in G} = 2.8 \times 8 = -22\,400 \text{ [1]}$$

$$\text{Net welfare loss} = -5600 + 7200 - 22\,400 = -\$20\,800 \text{ [1]}$$

Any valid working is sufficient for [1]

OFR applies if the change in CS, PS or G is incorrect, but the calculation of net welfare loss is accurate.

Therefore the market is not allocatively efficient **[1]**

- (v) Calculate the indirect tax paid by airlines for the catering meals they bought in 2021 if the domestic indirect tax rate on food was 6.5% and their expenditure on meals was US\$54 506.70. **[2]**

$$\text{Expenditures without the tax} = \frac{54506.70}{1.065} = 51180$$

Any valid working should be rewarded with [1].

$$\text{Sales tax paid} = 54\,506.70 - 5\,1180 = \$3326.70$$

An answer of \$3326.70 without working is sufficient for [1].

Any valid alternative calculation should be rewarded.

$$\text{e.g. } 54\,506.7 \times (0.065/1.065) = \$3326.70$$

For full marks to be awarded the response must provide valid working and include correct units.

- (vi) The impact of a 4.5% rise in the price of airline tickets on the quantity of leisure travel demanded has been calculated to be -10.26%. Using the figures in **Table 3**, calculate the impact of the same 4.5% rise in the price of airline tickets on the quantity of business travel demanded. [2]

Impact on business travel: $-0.34 = \frac{\% \Delta Qd}{+4.5}$

Any valid working is sufficient for [1].

$-0.34 \times 4.5 = -1.53\%$

An answer of -1.53%, -1.53 or 1.53 without any valid working is sufficient for [1].

For full marks to be awarded the response must provide valid working, specify the decrease and include correct units.

- (vii) Using relevant information from **Table 3**, describe the expected impact this rise in global incomes will have on the demand for domestic routes in relation to the demand for international routes. [2]

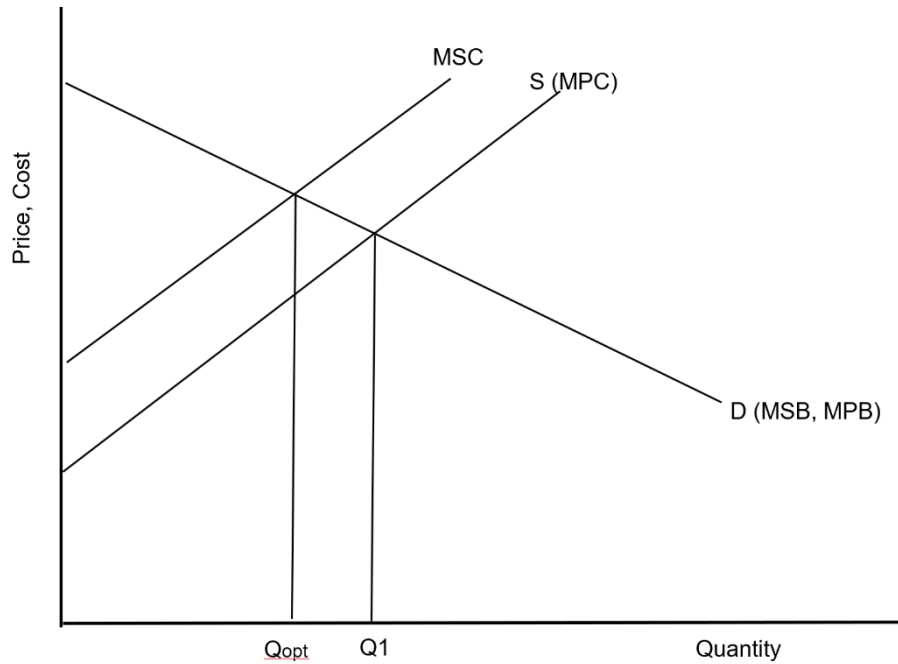
YED is lower for domestic routes than for international routes
OR an appropriate calculation is used. **[1]**

Therefore demand for domestic routes will increase by a smaller percentage. **[1]**

NB Calculations of demand based on the figures without a description of the impact may receive **[1]**.

- (viii) The information on **page 6** strongly suggests that the aviation industry is responsible for a significant market failure. Using this information **and** an appropriate diagram, explain the market failure the aviation industry creates. [4]

Level		Marks
0	The work does not meet a standard described by the descriptors below	0
1	The written response is limited	1-2
	For a negative production externalities diagram in which the MSC curve lies above the S, MPC curve and shows that the market output is greater than the socially optimum level of output OR that explains that the aviation industry is responsible for negative externalities leading to overproduction (free market equilibrium is greater than the socially optimum level of output).	
2	The written response is accurate	3-4
	For a negative production externalities diagram in which the MSC curve lies above the S (MPC) curve and shows that the market output is greater than the socially optimum level of output AND that explains that the aviation industry is responsible for negative externalities leading to overproduction (free market equilibrium is greater than the socially optimum level of output).	



An alternative approach, which should be accepted, is that MSB is below the demand curve and the market failure is caused by a consumption externality.

The y axis may be labelled price but could be costs or benefits and the x axis is labelled quantity.

- (b) Using the text/data provided and your knowledge of economics, recommend a policy that may be implemented to reduce the contribution of emissions the aviation industry makes to global warming.

[10]

Possible policies may include (but are not restricted to):

- Introduce carbon taxes in the aviation industry
- Cap & trade schemes on a wider (global) basis
- Impose indirect (sales) tax on air ticket purchases
- Eliminate fuel and other subsidies paid to airlines
- Subsidize rail and other greener forms of transport
- Enter into international agreements to reduce emissions from the aviation industry
- Ban short-haul flights
- Any other valid policy.

Assessment Criteria

Recommend—present an advisable course of action with appropriate supporting evidence/reason in relation to a given situation, problem, or issue.

Marks	Level descriptor
0	<ul style="list-style-type: none"> • The work does not reach a standard described by the descriptors below.
1–2	<ul style="list-style-type: none"> • The response identifies a policy. • The response uses no economic theory to support the recommendation. • Economic terms are stated but are not relevant. • The response contains no use of text/data to support the recommendation. • The response contains no evidence of synthesis or evaluation.
3–4	<ul style="list-style-type: none"> • The response identifies an appropriate policy. • The response uses limited economic theory to support the recommendation in a superficial manner. • Some relevant economic terms are included. • The response contains no use of relevant text/data to support the recommendation. • The response contains evidence of superficial synthesis or evaluation.
5–6	<ul style="list-style-type: none"> • The response identifies and explains an appropriate policy. • The response uses relevant economic theory to partially support the recommendation. • Some relevant economic terms are used appropriately. • The response includes some relevant information from the text/data to support the recommendation. • The response contains evidence of appropriate synthesis or evaluation but lacks balance.
7–8	<ul style="list-style-type: none"> • The response identifies and fully explains an appropriate policy. • The response uses relevant economic theory to support the recommendation. • Relevant economic terms are used mostly appropriately. • The use of information from the text/data is generally appropriate, relevant and applied correctly to support the recommendation. • The response contains evidence of appropriate synthesis or evaluation that is mostly balanced.
9–10	<ul style="list-style-type: none"> • The response identifies and fully explains an appropriate policy. • The response uses relevant economic theory effectively to support the recommendation. • Relevant economic terms are used appropriately throughout the response. • The use of information from the text/data is appropriate, relevant and supports the analysis/evaluation effectively. • The response contains evidence of effective and balanced synthesis or evaluation.

2. (a) (i) Describe the information shown in **Figure 2**. [2]

Wheat prices have been rising (from August 2020 to February 2021) [1]

And one of the following: [1]

- Wheat prices are volatile
- Wheat prices increased from around US\$4.90 in August 20 to around US\$6.60 in February 21
- The period saw two peaks (in Oct 20 and Jan 21)
- Wheat prices levelled off after (Nov 20 or Jan 21)
- *Any other valid piece of information shown should be awarded.*

A response which merely details the data may be awarded [1].

(ii) Using **Figure 2 and** the information above, explain **two** reasons that may account for Turkey’s decision to eliminate the 20 % tariff on wheat imports from Russia. [4]

Level		Marks
0	The work does not meet a standard described by the descriptors below	0
1	The written response is limited	1-2
	For a limited explanation of one reason, award a maximum of [1]. For an accurate explanation of one reason OR a limited explanation of two reasons, award a maximum of [2].	
2	The written response is accurate	3-4
	For providing an accurate explanation of one reason AND a limited explanation of a second reason award a maximum of [3]. For providing accurate explanations of two reasons award a maximum of [4].	

Reasons may include:

- The price of wheat has been rising; it had increased by 35% in 6 months. Elimination of the tariff would keep wheat prices low and help to maintain the competitiveness of Turkish flour (in its export markets).
- Russia had recently decided to introduce a tax on its wheat exports. Elimination of the tariff would keep wheat prices low and help to maintain the competitiveness of Turkish flour (in its export markets).
- Elimination of the tariff would decrease the costs of producing wheat and thus the price of flour in Turkey, reducing inflationary pressure.
- By eliminating the tariff on wheat imports, Turkey may hope that Russia will reciprocate and eliminate the tax on wheat exports.
- The Turkish government supports trade liberalization as a policy for efficiency / growth / development / diplomacy
- There may have been a poor harvest in Turkey and thus the policy would help to prevent the domestic wheat price from increasing / ensure food security
- *Any other valid reason.*

- (iii) Using **Figure 3**, calculate the change in social/community surplus that resulted from the elimination of the 20% tariff. [2]

$$6 \times 1.2 \times 0.5 = 3.6$$

$$6 \times 1.2 \times 0.5 = 3.6$$

Any valid working is sufficient for [1].

$$3.6 + 3.6 = \$7.2 \text{ million}$$

An answer of 7.2 without workings is sufficient for [1]. For full marks to be awarded, the response must provide valid working and include correct units.

An alternative approach which may be rewarded is to calculate the net change in CS + PS only

$$\text{Change in CS} = 0.5 \times 1.2 \times (64 + 70) = 80.4$$

$$\text{Change in PS} = 0.5 \times 1.2 \times (30 + 36) = 39.6 \text{ (decrease)}$$

Any valid working is sufficient for [1].

$$\text{Change in social surplus} = 80.4 - 39.6 = \$40.8 \text{ million}$$

For full marks to be awarded the response must provide valid working and include correct units.

- (iv) The currency of Turkey is the Turkish lira (TL). If TL1.00 = US\$0.134, using **Figure 3**, calculate in TL, the change in the monthly total revenues of Turkish wheat producers as a result of the elimination of the 20 % tariff. [3]

$$\text{TR1} = 7.20 \times 36 = \$259.20$$

$$\text{TR2} = 6 \times 30 = \$180 \text{ [1]}$$

$$\text{Change} = 180 - 259.20 = -79.20 \text{ [1]}$$

Any valid working is sufficient for [1].

OFR may be applied if either the initial or the final revenues collected is correct and the subtraction is performed correctly.

$$-79.2 \times 1/0.134$$

$$-591\,044\,776 \text{ OR } -591.04 \text{ million [1]}$$

Rounding to two decimal places is not required for the first option above i.e., -591 044 776 is sufficient and 591 044 776.12 is not required.

*OFR applies if an **incorrect** US\$ figure is converted correctly into TL, and [1] may be awarded; the mark is awarded for accurately converting a US\$ figure to a TL figure.*

A candidate may be awarded [1] for converting accurately before applying to (an incorrect) figure for revenue (i.e. $1/0.134 = 7.46$)

A valid alternative approach is

$$TR1 = 7.20 \times 36 = \$259.20$$

$$TR2 = 6 \times 30 = \$180 \text{ [1]}$$

$$\text{Change} = 180 - 259.20 = -79.20 \text{ [1]}$$

Any valid working is sufficient for [1].

$$1/0.134 = 7.46$$

$$-79.2 \times 7.46$$

$$= -590\,832\,000 \text{ OR } -590.83 \text{ million [1]}$$

OFR may be applied if either the initial or the final revenues collected is correct and the subtraction is performed correctly.

For full marks to be awarded the response must provide valid working and specify the decrease.

NB TL units are not required, since “in TL” is referred to in the question.

- (v) Using information from **Table 4**, calculate the additional income tax Beycan would pay if the Turkish government decided to increase the marginal tax rate for incomes over TL600 001 to 55%, as it has been in Austria since 2016. [2]

$$355\,000 \times 0.55 - 355\,000 \times 0.40 \text{ [or, } 355\,000 \times 0.15] \text{ [1]}$$

Any valid working is sufficient for [1].

$$\text{TL } 53\,250 \text{ [1]}$$

OR

$$354\,999 \times 0.55 - 354\,999 \times 0.4 = 195\,249.45 - 141\,999.60 = 53\,249.65$$

OR

$$354\,999 \times 0.15 = 53\,249.85$$

Responses may also take the approach of calculating the initial and the final tax paid

$$\text{Initial tax paid} = 22 \times 0.15 + 27 \times 0.2 + 131 \times 0.27 + 420 \times 0.35 + 355 \times 0.4 = 333.07$$

$$\text{Final tax paid} = 22 \times 0.15 + 27 \times 0.2 + 131 \times 0.27 + 420 \times 0.35 + 355 \times 0.55 = 386.32 \text{ [1]}$$

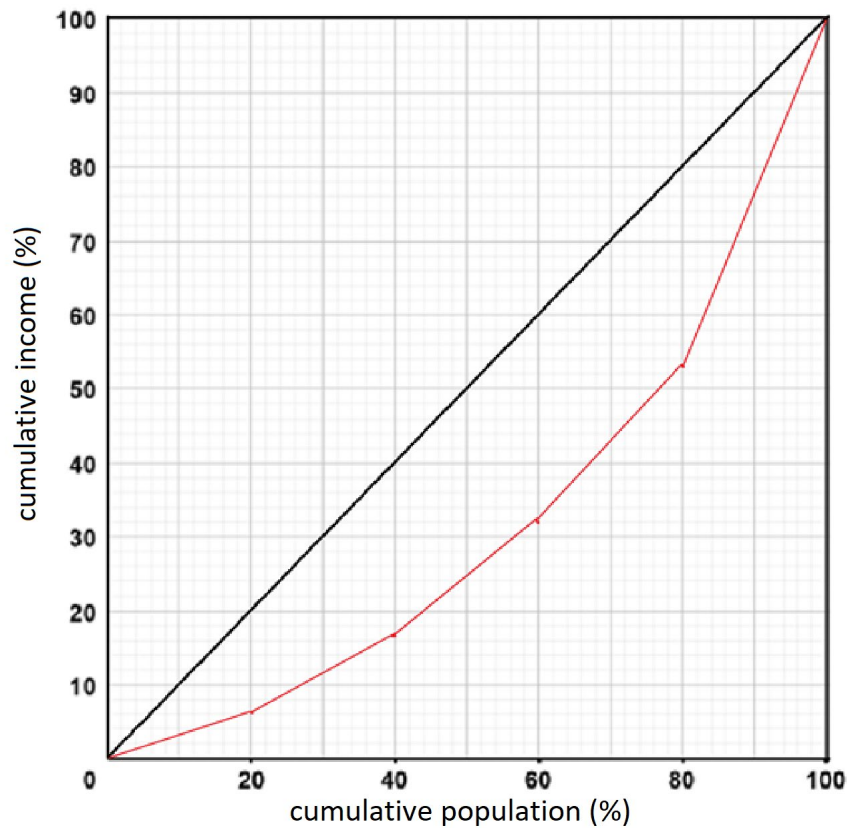
Any valid working is sufficient for [1].

$$\text{Change} = 386.32 - 333.07 = \text{TL}53\,250 \text{ [1]}$$

For full marks to be awarded the response must provide valid working and include correct units.

- (vi) Using the income distribution information in **Table 5**, construct a fully labelled Lorenz curve diagram for Turkey in 2017.

[2]



For constructing a Lorenz curve below the diagonal (which need not be drawn) with correct labels on the axes [1]

For an accurately constructed Lorenz curve [1]

The vertical axis should be labelled cumulative % of income, or % of income and the horizontal axis should be cumulative % of population or % of population. A title is not necessary.

{correct points: (0,0); (20, 6.20); (40, 17.00); (60, 31.80); (80, 52.40); (100,100)}

- (vii) Using the data in **Table 6**, explain why a greater reliance on indirect taxes compared to income taxes for revenue collection is often associated with a higher Gini coefficient value.

[4]

Level		Marks
0	<i>The work does not meet the standards described by the descriptors below</i>	0
1	<i>The written response is limited</i>	1-2
	Indirect taxes are regressive / income taxes are progressive. Turkey relies much more on indirect taxes and less on income taxes and has a higher Gini coefficient.	
2	<i>The written response is accurate</i>	3-4
	<ul style="list-style-type: none"> • Indirect taxes are regressive with respect to income and thus burden the poor proportionately more [1] • personal income taxes are progressive, so it is higher income earners that pay proportionately more [1] • Turkey relies much more on indirect taxes (40.5% cf 32.1%)/ less on income taxes (15.4% cf 23.9%) (than the other countries / OECD) [1] • Turkey therefore has greater income inequality and thus a higher Gini coefficient [1]. 	

- (viii) Identify **one** reason for the difference between Turkey's GNI per capita ranking and its HDI ranking.

[1]

For identifying that Turkey's spending on education is low compared with other countries.

NB The response must refer to education.

- (b) Using the text/data provided and your knowledge of economics, recommend a policy that the government of Turkey could introduce to reduce income inequality.

[10]

Possible policies may include (but are not restricted to):

- Increasing the progressivity of direct taxes
- Reducing reliance on indirect taxes
- Implementing or increasing a wealth tax
- Investing more in education
- Investing more in health care
- Investing more in human capital
- Increasing transfer payments (or, conditional cash transfers)
- Provide universal basic income
- Improving access to labour markets
- Measure(s) to improve equality of opportunity
- Policies to reduce discrimination
- Increase the minimum wage
- *Any other valid policy.*

Assessment Criteria

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