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QUALIFY FOR THE FUTURE WORLD
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Level 3 Economics, 2015

91400 Demonstrate understanding of the efficiency of different market structures using marginal analysis

2.00 p.m. Wednesday 18 November 2015
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of the efficiency of different market structures using marginal analysis.	Demonstrate in-depth understanding of the efficiency of different market structures using marginal analysis.	Demonstrate comprehensive understanding of the efficiency of different market structures using marginal analysis.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–10 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

Excellence

TOTAL 21

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QUESTION ONE: PERFECT COMPETITION

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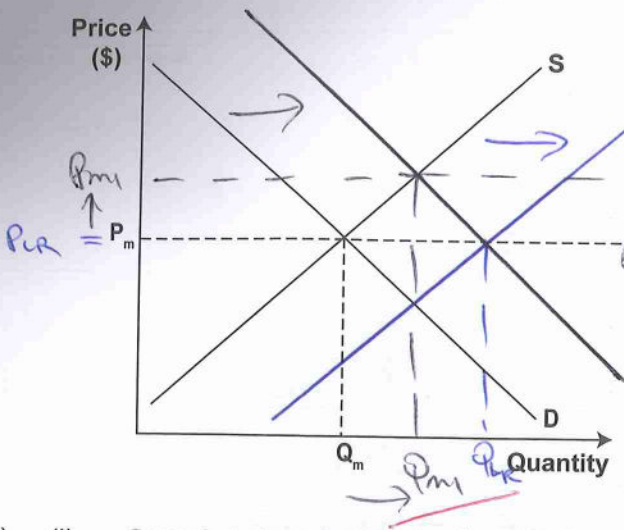
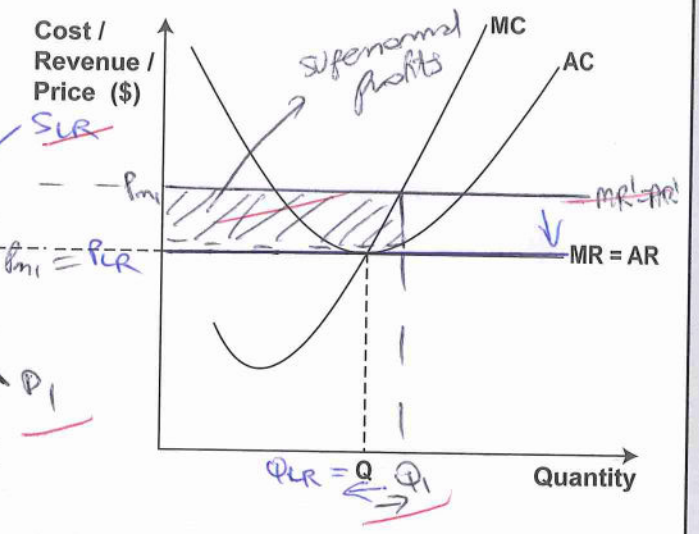
Graph One: The market



Graph Two: The individual perfectly competitive firm



(a) (i) Complete Graph One to show the impact of an increase in market demand on the market equilibrium price and quantity. Label the new price P_{m1} and the new quantity Q_{m1}.

(ii) Complete Graph Two to show the impact of an increase in market demand on the short-run profit maximising level of output for the individual firm. Label the new level of output as Q_1.

(iii) On Graph Two, clearly shade and label the new level of economic profit that will be earned by the individual firm at Q_1. Identify the economic profit as normal, subnormal, or supernormal.

(b) Use **marginal analysis** to compare and contrast the short-run and long-run profit and output decisions of a perfect competitor after an increase in market demand.
In your answer:

- explain in detail the changes to the short-run level of output and profit for the individual firm as a result of the increase in market demand
- make changes to Graph One to show how the market equilibrium price and quantity will be affected in the long run
- explain how the long-run changes in the market will affect the long-run levels of output and profit for the individual firm
- refer to Graph One and Graph Two.

As a result of an increase in market demand, the demand curve on graph 1 shifts to the right from D to D_1, as shown on graph 1. This causes the market price to increase from P_m to P_{m1}, as shown on graph 1. The price the individual firm receives also increases from P_m to P_{m1} as shown on graph 2 because perfect competitors are price takers as there are many small sellers selling homogenous products. At the

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original level of output, Q, MR' is now greater than MC, as shown on graph 2. Thus the extra cost of producing an additional unit of output is less than the extra revenue it generates, so the firm should increase output from Q to Q1 as shown on graph 2 to capture additional profits on the extra units of output sold between Q and Q1. At Q1, MC is equal to MR so this is the new profit maximising output level. Perfect competitors have perfect knowledge of market conditions and perfect mobility of resources. At Q1, AR' is greater than AC so the firm is making supernormal profits, as shown by the shaded area on graph 2. In the long run, there are no barriers to entry so the supernormal profits will attract some firms into the industry, resulting in an increase in market supply, as shown on graph 1 where the supply curve shifts to the right from S to SLR. This pushes the market price down from PM1 to PLR. As perfect competitors are price takers, the price they receive also falls. Thus their AR=MR curve shifts down from MR'=AR' to MR=AR, as shown on graph 2, thus reducing the size of their supernormal profit. Firms will continue to enter the industry until the price reaches a point where AR=AC, and the market is in a normal profit situation. This is at PLR, as shown on graph 1, where AR=AC and normal profits are made. At the original level of output Q1, MC is greater than MR so the firm should decrease output to QLR to avoid making marginal losses on the extra units of output sold between QLR and Q1. Thus at QLR, MR=MC so the extra cost of producing an additional unit of output equals the extra revenue it generates. Thus QLR is the profit maximising level of output in the long run, and normal profits are made.

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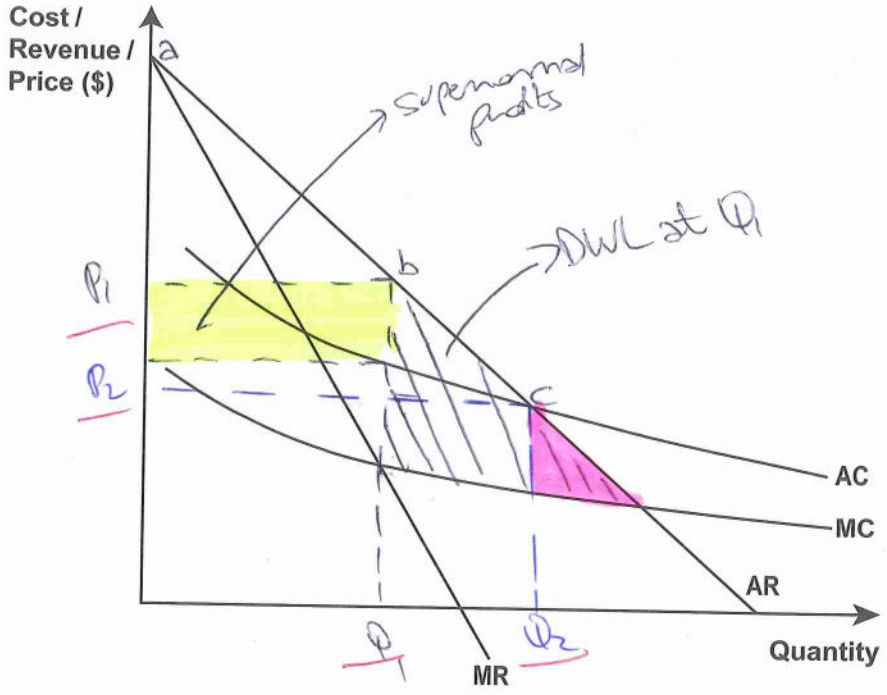
QUESTION TWO: NATURAL MONOPOLY

KiwiRail is a state-owned enterprise that was nationalised (bought back by the Government) in 2008. It can be considered an example of a natural monopoly in the New Zealand market for rail transport.

Graph Three: The New Zealand market for rail transport



(a) On Graph Three, label the profit maximising price (P_1) and quantity (Q_1).

One of the main benefits of KiwiRail being nationalised is that the Government can regulate a price that will encourage greater use of rail transport. Average cost pricing would be one method of achieving this objective.

(b) Compare and contrast the impact on consumers, KiwiRail, and allocative efficiency of regulating average cost pricing. Assume KiwiRail is initially at the profit maximising equilibrium of P_1 and Q_1.
In your answer:

- on Graph Three, identify the price (P_2) and quantity (Q_2) of rail services that would be provided if regulated average cost pricing was used by KiwiRail
- explain in detail the impact of regulated average cost pricing on consumers of rail transport and consumer surplus
- explain in detail the impact of regulated average cost pricing on KiwiRail's economic profit
- explain in detail why regulated average cost pricing would result in a more allocatively efficient outcome compared to the profit maximising equilibrium
- refer to Graph Three.

The profit maximising level of output for KiwiRail is at Q_1, P_1 where MR=MC. For a firm to be allocatively efficient, it must produced where

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D=S. For a natural monopoly like Kiwirail, MC=S but AR=D. As MR≠D, Kiwirail does not produce where D=S and is hence not allocatively efficient. At Q_1, P_1 is greater than MC so Kiwirail uses mark up pricing. As a result, it is underproducing and overpricing so Kiwirail's profit maximising output is not socially desirable. Therefore the total surpluses are not maximised, and there is a deadweight loss (DWL), as shown by the black shaded area on graph 3. When average cost pricing is used, Kiwirail must operate at where AC=AR; this is at P_2, Q_2. Thus the price consumers pay has fallen from P_1 to P_2, and the quantity consumed has risen from Q_1 to Q_2. Thus consumer surplus increases from P_1ab to P_2ac, as shown on graph 3. At the profit maximising level of output of Q_1, AR was greater than AC so Kiwirail was making supernormal profits, as shown by the yellow area. However, at Q_2, when Average cost pricing is used, AC=AR so normal profits are being made; thus Kiwirail has had a fall in profits. When using average cost pricing, Kiwirail operates where AR=AC. Although AR=D, AC≠S so Kiwirail is still not producing where D=S and is hence still allocatively inefficient. However as a result of average cost pricing, the rail transport is cheaper at P_2 and there is an increase in output of Q_2, so rail transport is no longer as overpriced and underpriced compared to when Kiwirail was left to its own devices. Therefore there has been an increase in total surpluses, so the deadweight loss has decreased, as shown by the pink area which represents the DWL after average cost pricing is used. As the DWL has decreased, the loss of allocative efficiency has fallen, so average cost pricing is more allocatively efficient than the profit maximising equilibrium.

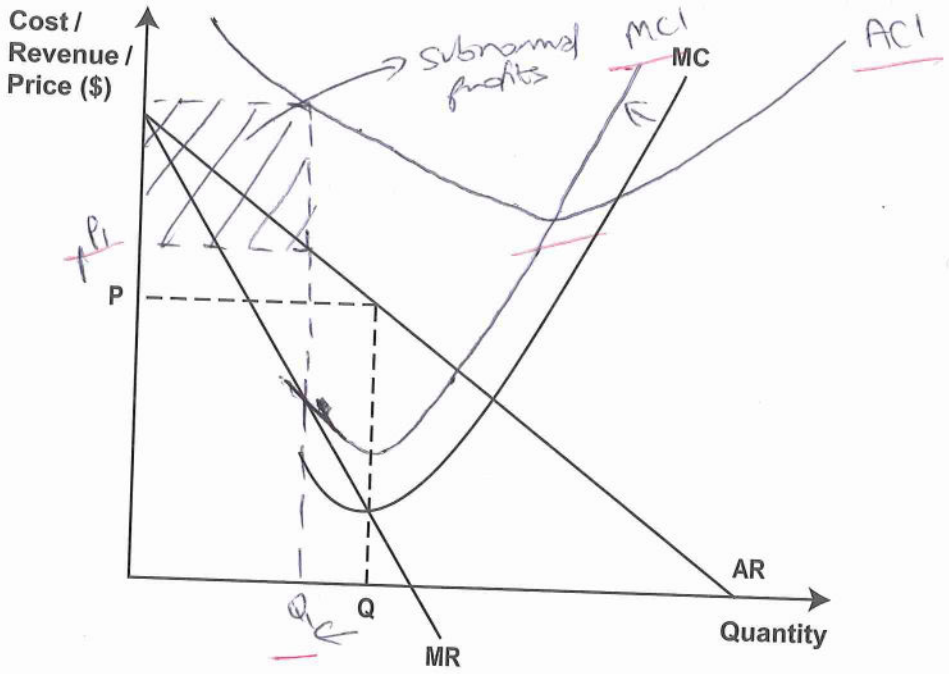
C/C

E7

QUESTION THREE: MONOPOLY

On 1 April 2014, the New Zealand minimum wage was increased to $14.25. This would have resulted in a significant increase in labour costs for firms that were paying workers the previous figure of $13.75.

Graph Four: A monopoly market



(a) Complete Graph Four to show the impact of increased labour costs for a monopoly. Clearly label any changes.

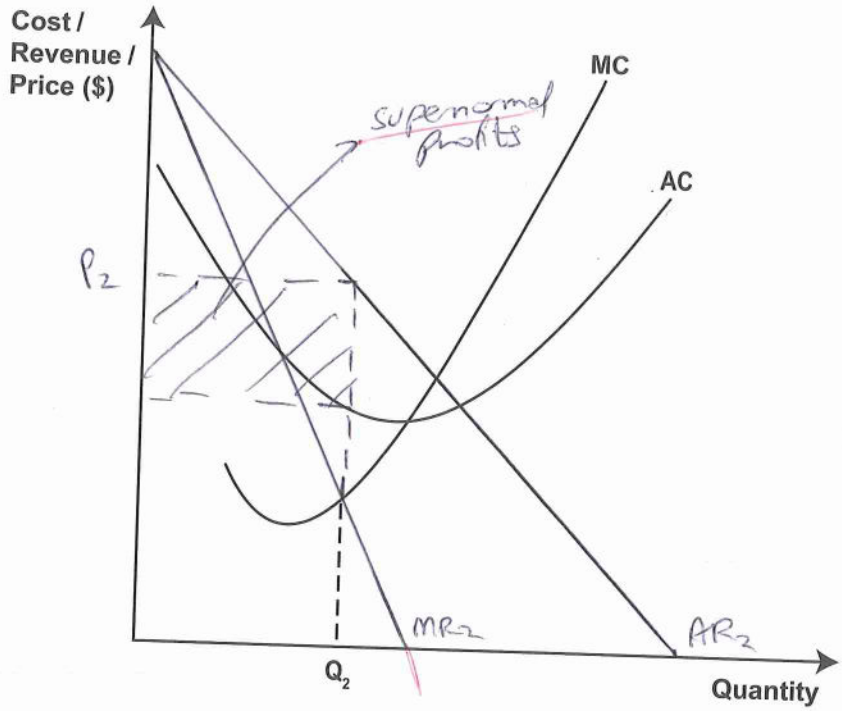
(b) Explain in detail, using **marginal analysis**, the change in the profit maximising price and quantity as a result of increased labour costs.

As a result of an increase in labour costs, the marginal costs have increased since it now costs the firm more to produce an additional unit of output. At the original level of output, Q, MC1 is now greater than MR so the extra cost of producing an additional unit of output is greater than the extra revenue it generates, thus the firm should decrease output to Q1 to avoid making marginal losses on the extra units of output sold between Q and Q1. At Q1, MC1 is equal to MR so the extra cost of producing an additional unit of output equals the extra revenue it generates, thus Q1 is the new profit maximising level of output. If the monopolist chooses to produce at Q1, the price is determined by consumer demand as monopolists only have control over price or quantity. Thus the price rises from P to P1.

(c) Compare and contrast the long-run price and output decisions of a monopolist earning a subnormal profit with a monopolist earning a supernormal profit.
In your answer:

- on **Graph Four** on the previous page, draw and label the average cost curve for the monopolist if the increase in labour costs results in a **subnormal** profit being earned. Label the curve $\mathbf{AC_1}$.
- explain in detail what the monopolist will do in the long run if **subnormal** profits continue to be earned and there are no other changes in costs or revenue
- on **Graph Five** below, draw and label the revenue curves for a profit maximising monopolist earning a **supernormal** profit at $\mathbf{Q_2}$. Label the curves $\mathbf{MR_2}$ and $\mathbf{AR_2}$, and the price $\mathbf{P_2}$
- explain in detail why the monopolist producing at $\mathbf{Q_2}$ can continue to earn **supernormal** profits in the long run
- explain in detail why the price and output decisions of the monopolist will remain unchanged in the long run if **supernormal** profits continue to be earned.

Graph Five: A monopoly market



Subnormal profits are a level of profit that is below what is necessary to keep a firm in the industry in the long run. At Q_1 on graph 4, AC is greater than AR so the firm is making subnormal profits, as shown by the shaded area. In the long run, although there are some barriers to entry, a monopolist is likely to leave the industry if subnormal profits are being made because there are no other changes to costs or revenue, and so this level of profit is insufficient to keep the firm in the industry in the long run. This is likely due to the high AC costs, and so the revenue is insufficient to cover the

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costs of production. At Q_2, AR^2 is greater than AC so the monopolist is making subnormal profits, as shown by the shaded area on graph 5. A monopolist has strong barriers to entry, and so this discourages competition and hence prevents firms from entering the industry and eroding the supernormal profits. This means the strong barriers to entry protect the supernormal profits gained by the monopolist. Therefore in the long run, a monopolist producing at Q_2 can continue making supernormal profits. The pricing and output decisions of the monopolist remains unchanged in the long run if supernormal profits are continued to be earned because a monopolist will produce at its profit maximising level of output where $MR^2 = MC$; this is at Q_2 as seen on graph 5. The monopolist will not produce anywhere above Q_2 because MC is greater than MR^2, so the firm should decrease output to Q_2 to avoid making marginal losses on the extra units of output sold. Similarly, the monopolist will not produce anywhere below Q_2 because MC is less than MR^2. Thus the firm should increase output to Q_2 to capture additional profits on the extra units of output sold. At Q_2, $MR^2 = MC$, as shown on graph 5. Thus the extra cost of producing an additional unit of output equals the extra revenue it generates, so the firm is maximising profits at Q_2. As monopolists only have control over price or quantity, by choosing to produce at Q_2, the consumers' demand will determine the price charged; this is at P_2 as shown on graph 5. Therefore the monopolist's price and output decisions will remain at P_2, Q_2 as shown on graph 5 in the long run if supernormal profits are still earned. This is a contrast to the monopolist in graph 4 making subnormal profits, as shown by the shaded area on graph 4, who will leave the industry. //

Excellence exemplar for 91400 2015		Total score	21
Q	**Grade score**	**Annotation**	
1	E7	Part (a) • All graph work correct and clearly drawn and labelled Part (b) Short run • Does not explain the increase in AR/MR to AR'/MR' needed for Merit but does recognise the perfect competitor is a price taker and must accept the constantly changing prices. This was accepted as alternative evidence. • Uses marginal analysis to explain the new quantity supplied, and that at the original output Q, MR>MC so increase output to Q_1 where MR=MC. Refers to *additional* profits between Q and Q_1 instead of *marginal* profits. • Recognises the SR profit is supernormal and that TR/AR > TC/AC Long run • Recognises the fall in MR'/AR' back down to MR/AR • Recognises the long run profit will be normal where TR/AR = TC/AC. • Explains the firm will be making marginal losses at Q_1 so will reduce output to Q where MR=MC This candidate gave Excellence answers for all points but did not refer to marginal profits in the short run nor either of the distinguishing parts for super or normal profits, and so was reduced from E8 to E7.	
2	E7	Part (a) • Correct graphing of profit-maximising price and quantity Part (b) • Correct graphing of average cost pricing price and quantity • Correctly identifies the average cost pricing will cause a drop in price and increase in quantity but does not explain in detail how this can cause an increase in consumer surplus as needed for Excellence evidence • Correctly explains the change in profit from supernormal to normal with the evidence that now AC=AR at Q2 • Correctly explains the average cost pricing will be a more allocatively efficient outcome by showing the decreased DWL and increased total surplus while making clear comparisons between profit-maximising output and regulated average cost output. This candidate gave Excellence responses with good comparisons, however was weaker in their explanation for consumer surplus and hence was reduced from E8 to E7.	

3	E7	Part (a) • Correctly moves the MC to the left and draws in the resulting reduced quantity and increased price Part (b) • Correctly uses marginal analysis to explain the change in output and price after the increase in labour costs Part (c) • Correctly draws the AC curve above AR and turning on the MC curve • Correctly recognises the monopoly will have to leave the market in the long term, identifying this occurs at AC>AR or TC>TR. • Correctly identifies the monopoly has strong barriers to entry but does not identify any such barriers. • Recognises the monopoly operates at profit maximisation and fully explains why price and quantity will remain unchanged. This candidate gave an Excellence response but was weak in explaining strong barriers, reducing this from E8 to E7.