No part of the candidate evidence in this exemplar material may be presented in an external assessment for the purpose
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Level 3 Economics, 2016

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

2.00 p.m. Friday 25 November 2016
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 2–11 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.

Merit

TOTAL 17

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QUESTION ONE: NATURAL MONOPOLY

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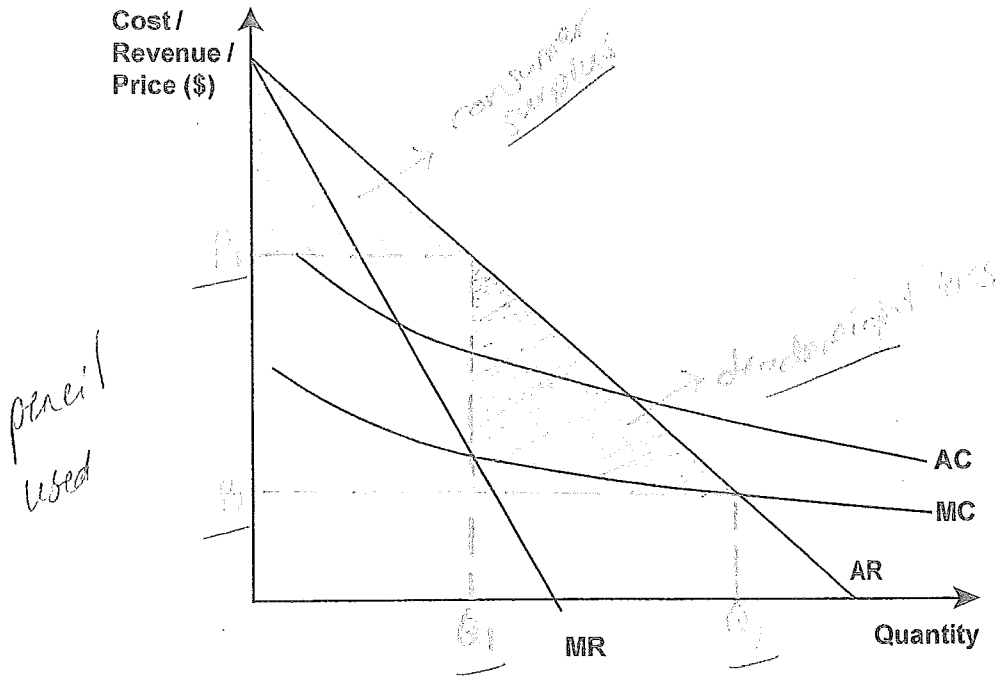
Since the mid 1990s, the New Zealand electricity industry has undergone significant reforms and deregulation. This has included splitting New Zealand's largest electricity generator into three competing generators, separating ownership of electricity lines and supply businesses, selling state-owned electricity generators, and introducing a system that enabled consumers to switch electricity retailers easily. These reforms were designed to make the electricity retail market much more competitive, giving consumers more choice and lower prices.

Source (adapted): http://www.mbie.govt.nz/info-services/sectors-industries/energy/electricity-market/electricity-industry/chronology-of-new-zealand-electricity-reform/chronology-of-nz-electricity-reform.pdf

Graph One: New Zealand retail electricity market



(a) (i) On Graph One, label the profit-maximising price (P_1) and the profit-maximising quantity (Q_1), assuming that the New Zealand retail electricity market was an example of a natural monopoly before the reforms.

(ii) Clearly shade and label the consumer surplus and deadweight loss that occurs at the profit-maximising equilibrium (P_1 and Q_1).

(iii) Label the price (P_2) and quantity (Q_2) that would result if the reforms were successful in achieving an allocatively efficient outcome in the New Zealand retail electricity market.

(b) Refer to Graph One to compare and contrast the efficiency of the two equilibriums.

In your answer, fully explain :

- how electricity consumers would be affected by the electricity reforms if the reforms achieved an allocatively efficient outcome
- why P_2 and Q_2 would result in an allocatively efficient outcome in the New Zealand retail electricity market, in contrast to the profit-maximising equilibrium (P_1 and Q_1)
- what additional intervention could be needed by the Government at P_2 and Q_2 in the electricity market if costs for electricity retailers did not decline.

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Allocative efficiency would be achieved if the natural monopoly were to operate at the desired equilibrium of P2, Q2. This is because, at this position, consumer and producer surplus are maximised, and this indicates that deadweight loss is non-existent and all resources available to the market, including net social welfare, are being used to their potential. This is different if the NZ electricity market were to operate at the profit maximising position, of P1, Q1, and this is because deadweight loss is at a high level, as shown by the shaded area, which indicates that resources are being lost to the market and both consumer and producer surplus are not being maximised. Consumer and producer benefit and satisfaction received is better off with the desired allocatively efficient outcome, as with the profit maximising position, deemed unfair by society, output is restricted to Q1 and charged at a higher price of P1; this takes advantage of consumers as the natural monopoly is the sole provider of electricity, ~~so they~~ and so consumers are forced to pay a greater price for and receive a reduced level of electricity. ~~for~~ Electricity consumers are better off with the allocatively efficient ~~output~~ price and ~~price~~ output of P2, Q2, as they have the ability to purchase a greater level of electricity for a ~~more~~ relatively more affordable price, for which this is deemed fair by society. However, additional intervention may be required as a result of operating at the equilibrium price and quantity of P2, Q2. This is because producers are at a disadvantage/

M5

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See

Extra space if required.
Write the question number(s) if applicable.

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QUESTION NUMBER 1(b) ~~1a~~

as a result of operating at the desired ~~ap~~ social optimum of P=MC. Supplying a large level of output of electricity to consumers at a low price causes profit levels for firms to decrease from earning supernormal, where AR>AC, as at the profit maximising position of P_1, Q_1, to generating a subnormal profit, where AC>AR. As a result of facing increasing ~~costs~~ costs in order to produce electricity the producer may be forced to exit the industry and shut down, unless the government chooses to subsidise costs because they are the sole provider of the good. Because this causes government spending to increase, the government may choose to regulate the market to P=AC or average cost pricing. ~~In~~ In this way, both consumers & producers are benefitted. Consumers pay a relatively low price for electricity, with output no longer being restricted, and producers receive a relatively high price compared to that at the social optimum, for which they can generate a normal profit, where AR=AC.

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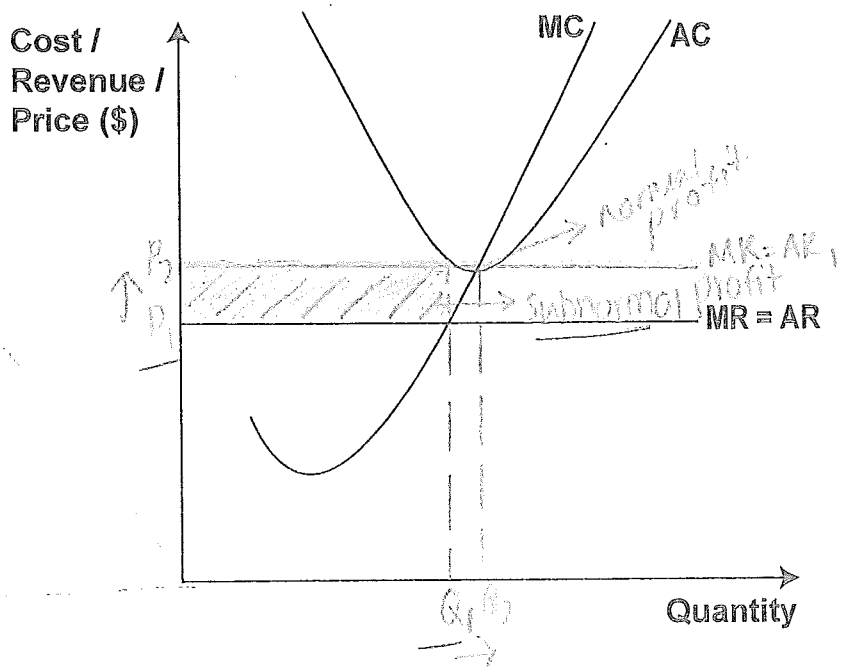
QUESTION TWO: PERFECT COMPETITION

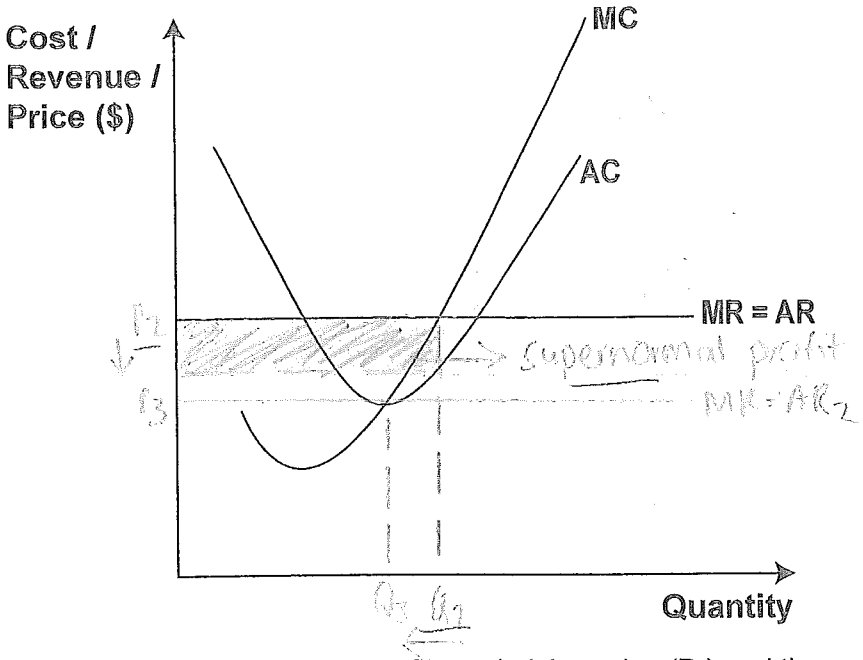
Graph Two: An individual perfectly competitive firm earning a subnormal profit in the short run



(a) (i) On Graph Two above, label the loss-minimising price (P_1) and the loss-minimising quantity (Q_1).

(ii) Clearly shade and label the subnormal profit earned by the firm in Graph Two.

Graph Three: An individual perfectly competitive firm earning a supernormal profit in the short run



(b) (i) On Graph Three above, label the profit-maximising price (P_2) and the profit-maximising quantity (Q_2).

(ii) Clearly shade and label the supernormal profit earned by the firm in Graph Three.

(c) Use marginal analysis to compare and contrast the long run situations of the firm earning subnormal profits with the firm earning supernormal profits, assuming that both firms stay in the industry.

In your answer:

- use Graphs Two and Three to show changes in the long run to profit, price, and output
- refer to the changes in your explanation.

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• An individual perfectly competitive firm earning a ~~super~~ subnormal profit in the short run will earn a normal profit in the long run. The subnormal profit means that AC>AR, and because of this some ~~firms~~ firms will choose to leave the industry, which causes market supply to decrease. This results in an increase in the market price, which causes the price of the good or service sold by the individual perfectly competitive firm to increase from P1 to P2. This also causes the demand ~~curve~~ curve for the firm to rise from MR=AR to MR=AR. The price for this firm increases due to the fact that they are price takers, which indicates that they are too small in trading volumes to influence the market price, but instead have to accept it. This causes, in the long run, the individual perfectly competitive firms, assuming it stays in the industry, to increase profit levels from subnormal to normal profits, where AC=AR. The firm will move its profit maximising position quantity to Q2, as operating at a position below this point ~~will~~ will see the firm experiencing losses in additional revenue as MR>MC. They must move to the price and quantity of P2, Q2, the new profit maximising position, in order to maximise profits.

• An individual perfectly competitive firm earning a supernormal profit in the short run will earn a normal profit in the long run. The supernormal profit means that AR>AC, and because a PC ~~firm~~ industry has no barriers to entry, other firms will be attracted to earning a supernormal profit, which ~~case~~ means more PC firms, and so market supply increases. This results in a decrease in the market price, which

More answer space is available on the next page.

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causes the price of a good or service sold by the individual perfectly competitive firm to decrease from P_2 to P_3. This also causes the demand curve to shift downwards and decrease from MR=AR to MR=AR2. The price for this firm decreases due to the fact they are also price takers, and so cannot influence the ~~world~~ market price. As a result, in the long run, the individual perfectly competitive firm, assuming it ~~stays~~ stays in the industry, will see profit levels decrease from supernormal to normal profits, due to the fact that supernormal profits are divided up among PC firms. The firm will move its profit maximising position, output to Q_2, Q_3, as operating at a position above this point, where MC > MR, will result in the firm experiencing increasing costs. They must move to this new profit maximising position of P_3, Q_3 in order to maximise profits.

M6

QUESTION THREE: MONOPOLY

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The average real income per person in New Zealand increased from $43 313 to $48 472 between 2010 and 2015. This indicates an increase in purchasing power for New Zealand consumers during this time period.

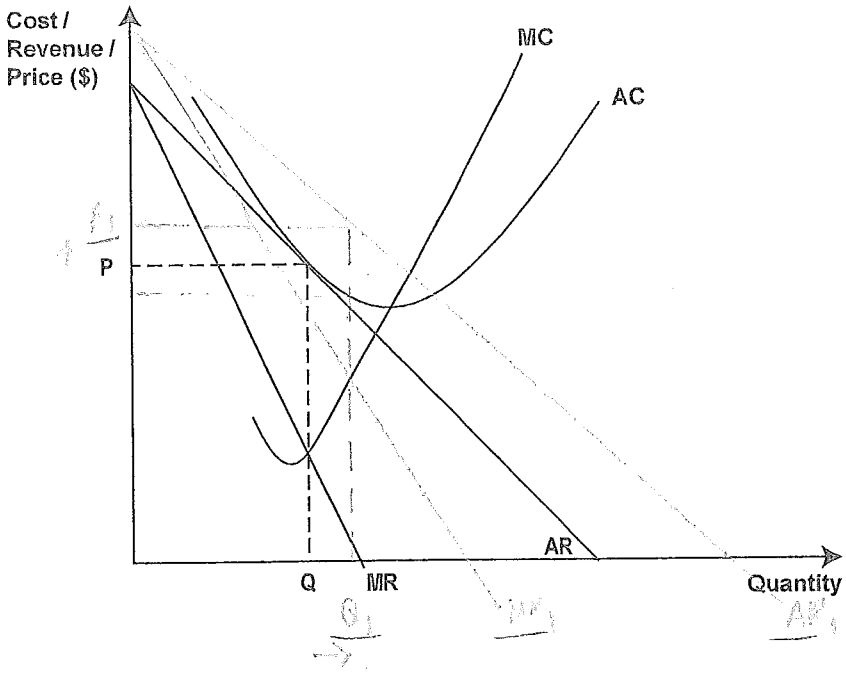
Source (adapted): http://www.stats.govt.nz/browse_for_stats/snapshots-of-nz/nz-social-indicators/Home/Standard%20of%20living/disp-income-pp.aspx

For the same time period, two-year fixed mortgage rates decreased from 7.2% to 5.3%.

Source (adapted): http://www.rbnz.govt.nz/statistics/key_graphs/mortgage_rates/

These two economic events could have resulted in an increase in market demand for some firms and a reduction in fixed costs for firms that had fixed mortgages on their premises.

Graph Four: A monopolist earning a normal profit



pencil used

(a) Complete Graph Four above to show the impact of an increase in market demand on a monopolist earning a normal profit. Clearly label the changes (if any) to the profit-maximising price and the profit-maximising quantity.

(b) Complete Graph Five on page 9 to show the impact of a reduction in fixed costs on a monopolist earning a normal profit. Clearly label the changes (if any) to the profit-maximising price and the profit-maximising quantity.

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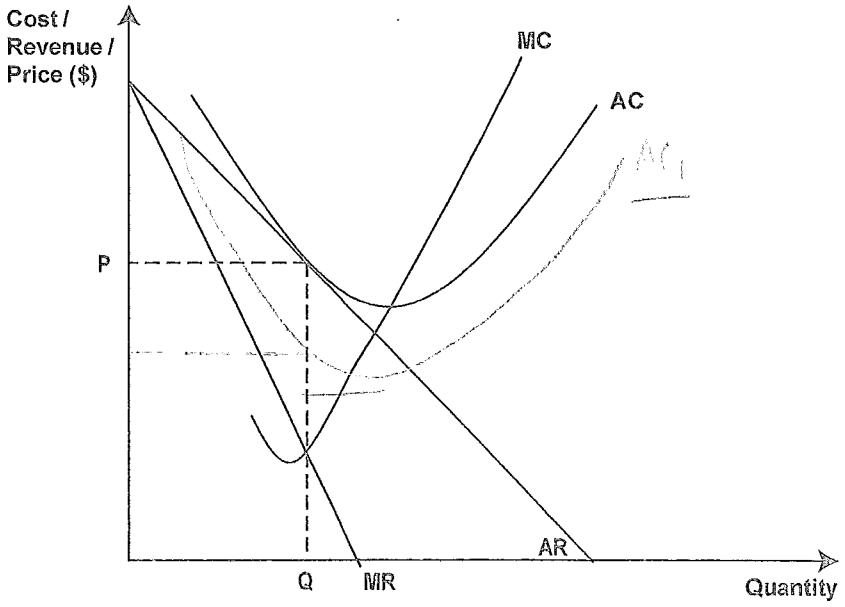
Graph Five: A monopolist earning a normal profit



(c) Use marginal analysis, and Graphs Four and Five, to compare and contrast the impact on the profit, price, and output decisions of a monopolist, of an increase in market demand with a reduction in fixed costs.

In your answer, include:

- the impact on a monopolist's profit of an increase in market demand
- the impact on a monopolist's profit of a reduction in fixed costs
- whether an increase in market demand or a reduction in fixed costs would have a greater impact on the profit-maximising price and profit-maximising quantity for a monopolist.

the increase in market demand causes the MR and AR (marginal revenue and average revenue) curves to both increase and shift to the right. The MR curve increases to become MR1, and the average revenue curve increases to become AR1. This has a positive effect on the monopoly, as the AR curve has increased which causes the level of AR to be greater than average costs, or AC. the firm was previously generating a normal profit, as AC=AR, but an increase in market demand has now ~~resul~~ resulted in the firm generating a supernormal profit where AC<AR. The increase in market demand has caused the price of the good or service sold to increase from P to P1. the quantity ~~demanded~~ supplied ~~and supplied~~ of the good or service sold has also increased

More answer space is available on the next page.

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from Q to Q_1. Firms will increase Qs in order to benefit from the price rise, because this good or service is now relatively more profitable. Firms will move their current profit maximising position output of Q to that of Q_1. This is because operating at a position below this point will see the monopoly experiencing losses in additional revenue as MC>MR the monopoly must operate at the new profit maximising position of P_1, Q_1 in order to maximise profit levels.

The ~~increase~~ reduction or decrease in fixed costs has no impact on the ~~MC~~ MC curve or ~~AR~~ AR curve. However, the decrease in fixed costs does have an impact on ~~the~~ the average cost, or AC, curve. It causes AC to decrease, with the curve shifting downward and moving from AC to become AC_1. The firm was previously generating a normal profit as AC=AR, but the reduction in fixed costs has resulted in a decrease in AC which has caused the ~~firm~~ firm to now generate a supernormal profit, due to the fact that ~~AC>~~ AC < AR. The reduction in fixed costs has had no impact on the ~~price~~ equilibrium price and quantity of P, Q, and there has been no ~~change~~ change to the profit maximising position ~~of~~ where MC=MR either. The firm should continue to operate at the current profit maximising position, of ~~MC=MR~~ P_1, Q_1 where MC=MR, in order to maximise profits. Operating at a position below Q would mean that MR>MC, and so the firm would be ~~los~~ losing additional revenue. Operating at a point above Q would mean that MC>MR, and so the firm would be facing increasing costs.

Not a positive impact

M6

Merit exemplar 2016

Subject:	Economics	Standard:	91400	Total score:	17

Q	Grade score	Annotation
1	M5	Shades and labels graph accurately. Explains the price and quantity effect on consumers of the allocatively efficient outcome but does not include explanation of consumer surplus. Explains the removal of deadweight loss, but omits an explanation of demand = supply (MC=AR), and incorrectly refers to both consumer and producer surplus being maximised, when it is the total sum of both that is maximised. Explains in detail the government intervention at the allocatively efficient outcome in the electricity market, which gains the M5 grade for this question.
2	M6	Shades and labels both graphs accurately. Explains in detail the changes to both markets in the long run, including market supply and market price, which lead to the changes in MR and AR for the firms. Explains in detail the normal profit earned in the long run on Graph Two, but neglects to include the detail of normal profit (AR=AC) on Graph Three. Uses marginal analysis correctly to explain the changes in output by the firms but omits the detail of missing out on marginal profits on Graph Two and making marginal losses on Graph Three.
3	M6	Labels changes on both graphs accurately, although the minimum of AC_1 on Graph Five is just barely within the margin of error at the intersection of MC. Explains in detail the impact on profit of a change in income, including changes to AR and MR and the resulting supernormal profit as AR_1>AC. Explains in detail the impact on profit of a change in fixed costs, reducing AC, making AR>AC_1. Explains the change to profit-maximising quantity, but incorrectly uses marginal analysis, including additional revenue instead of marginal profit. Marginal profit is additional profit made on an additional unit of output and is the important detail omitted from this response for the firm to change output – hence M6 is awarded.