Part A: Multiple Choice Questions (3 points each, total 30 points)

1. At that amount of output where diminishing marginal returns first sets in,
   A. total product will begin to decline.
   B. average product will begin to decline.
   C. marginal product will begin to decline.
   D. all of the above

2. Economists define the short run as a period of time so short that
   A. the amount of output cannot be changed except under diminishing marginal returns.
   B. the amount of output cannot be changed at all.
   C. only one factor of production can be varied.
   D. at least one factor of production cannot be varied.

3. In the figure above, the marginal product of the second worker is
   A. 10 units.
   B. 5 units.
   C. 2 units.
   D. 1 units.
4. Marginal cost is the increase in total _______ that results from a one-unit increase in ________.
   A. fixed cost; the fixed input
   B. cost; output
   C. variable cost; the variable input
   D. fixed cost; output

5. The marginal cost (MC) curve intersects the
   A. ATC, AVC, and AFC curves at their minimum points.
   B. ATC and AFC curves at their minimum points.
   C. AVC and AFC curves at their minimum points.
   D. ATC and AVC curves at their minimum points.

6. In the above figure, the long-run average cost curve exhibits economies of scale
   A. between 5 and 10 units per hour.
   B. between 10 and 20 units per hour.
   C. between 20 and 25 units per hour.
   D. along the entire curve.

7. A market is perfectly competitive if
   A. each firm in it can influence the price of its product.
   B. there are many firms in it, each selling a slightly different product.
   C. there are many firms in it, each selling an identical product.
   D. there are few firms in the market.

8. Which of the following is true regarding perfect competition?
   I. The firms are price takers.
   II. Marginal revenue equals the price of the product.
   III. Established firms have no advantage over new firms.
   A. I and II
   B. II and III
   C. I, II and III
   D. I only
9. The market for lawn services is perfectly competitive. Larry’s Lawn Service cannot increase its total revenue by raising its price because ________.
   A. Larry’s supply of lawn services is perfectly inelastic
   B. the demand for Larry’s services is perfectly inelastic
   C. Larry’s supply of lawn services is inelastic
   D. the demand for Larry’s services is perfectly elastic

10. In the above figure, if the milk industry is perfectly competitive, then the firm’s marginal revenue curve is represented by
   A. curve F.
   B. curve G.
   C. curve H.
   D. curve I.

Part B: Essay Questions (70 points)

1. Firat’s shoe company hires workers at $500/week and its total fixed cost is $1,000 a week. The table below sets out the company’s short run activities. (40 points)

<table>
<thead>
<tr>
<th>Labour (worker /week)</th>
<th>Output (Q)</th>
<th>Fixed Cost (FC)</th>
<th>Variable Cost (VC)</th>
<th>Total Cost (TC)</th>
<th>Marginal Cost (MC)</th>
<th>TR</th>
<th>Marginal Revenue (MR)</th>
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</table>
A. Calculate the FC, VC, TC, MC, and MR. Fill your results in the table appropriately. (34 points)

**Answer:** See the calculations in bold fonts in the table.

B. What is the profit maximizing level of output? Why? (6 points)

**Answer:** Profit maximizing level of output is between 120 and 160 because the MC and MR curves intersect in this range of output, i.e. 12.5 = 12.5. In particular, the mid-point output level, i.e. 140, is the level of output which maximizes the profit.

2. The figure below shows the market price and costs of a perfectly competitive firm.

![Graph of market price and costs](image)

A. What is the profit maximizing output if the market price is $16? Why?

**Answer:** When the market price is $16, the profit maximizing output (Q*) is 35. That is the output produced at the point where P=MC for the perfectly competitive firm.

B. Calculate the profit for the firm, and show the area of the profit on the graph above.

**Answer:**

\[
\text{Profit} = \text{TR} - \text{TC} = Q \times (P - \text{ATC}) = 35 \times (16 - 12.5) = $122.5
\]

OR

\[
\begin{align*}
\text{TR} &= P \times Q = 16 \times 35 = $560 \\
\text{TC} &= \text{ATC} \times Q = 12.5 \times 35 = $437.5 \\
\text{Profit} &= \text{TR} - \text{TC} = 560 - 437.5 = $122.5
\end{align*}
\]

**Note:** For Q=35, ATC is assumed to be equal to 12.5 (see the graph). The profit is the area labeled on the graph as ABCD.