Econ 100B
First Quiz
April 27, 2006

True-False *Questions* − −*Answer* A for True, *B* for false.

Fill in the bubbles on your scantron with your perm number, your name, and the form type. You must use a pencil, not a pen. Students who do this successfully will be awarded 5 free points. Students who fail to do so will not get these 5 points.
For the true false and multiple choice questions, each correct answer is worth 5 points. Each answer left blank is worth 2 points. Wrong answers are worth zero points.

1. A production isoquant is a locus of combinations of inputs that are equally profitable.

2. If there are constant returns to scale, then doubling the amount of any single input will exactly double the amount of output.

3. The marginal product of a factor is equal to the derivative of the production function with respect to the amount of this factor, holding the amounts of other factor inputs constant.

4. If the cost function is $C(y) = 10 + 3y$, then marginal cost is less than average cost for all levels of output.

5. Mr. O. Carr has the cost function $c(y) = y^2 + 64$ if his output, y, is positive and $c(0) = 0$. If the price of output is 12, Mr. Carr's profit-maximizing output is zero.

Multiple-Choice Questions

6. An oilfield is divided into two sections. Oil company A drills
an experimental well in Section A and oil company B drills an experimental well in Section
B. If either company strikes oil in its well, it knows that the value of the oil in its section is
$5 million dollars and if it doesn't strike oil in its section, the value of the oil in that section
is zero. Each of them has a probability of 1/2 of striking oil and the probabilities for the two
companies are independent. Neither company knows what the other company found. Oil
rights to the entire field (both sections) are sold in a first price sealed bid auction. Suppose
that Company A discovers that Company B will bid $7 million if it finds oil in its part and
$1 million otherwise. What would be the expected profit or loss of Company A if it finds oil
on its section and bids $6 million?

(a) Expected profit of $1.50 million.

(b) Expected loss of $2.50 million.

(c) Expected loss of $1/2 million.

(d) Expected profit of $4 million.

(e) Expected profit of $2.50 million.

7. A dealer decides to sell an antique automobile by means of an English auction with a reser-
vation price of $900. There are two bidders. The dealer believes that there are only three
possible values, $5,400, $4,500, and $900 that each bidder's willingness to pay might take.
Each bidder has a probability of 1/3 of having each of these willingnesses to pay and the
probabilities for each of the two bidders are independent of the other's valuation. Assuming
that the two bidders bid rationally and do not collude, the dealer's expected revenue from
selling the car is approximately

(a) $4,950

(b) $3,600

(c) $4,500

(d) $2,600

(e) $5,400

8. In any production process, the marginal product of labor equals:

(a) the value of total output minus the cost of the fixed capital stock.

(b) the change in output per unit change in labor input for "small" changes in the amount of input.

(c) total output divided by total labor inputs.

(d) total output produced with the given labor inputs.

(e) the average output of the least skilled workers employed by the firm.

9. A firm has fixed costs of 9,000. Its short run production function is $y = 4x^{1/2}$, where x is the amount of variable factor it uses. The price of the variable factor is $ 4,000 per unit. Where y is the amount of output, the short run total cost function is:

(a) $9,000/y + 4,000.$

(b) $13,000y.$

(c) $9,000 + 4,000y.$

(d) $9,000 + 250y^2.$

(e) $9,000y + 0.25y^2.$

10. A firm has the long run cost function $C(Q) = 4Q^2 + 4$. In the long run, it will supply a positive amount of output, so long as the price is greater than:

(a) 16

(b) 24

(c) 4

(d) 8

(e) 13

11. A competitive firm has a long run total cost function $c(y) = 5y^2 + 605$ for $y > 0$ and $c(0) = 0$. Its long run supply function is described as follows:

(a) $y = p/10$ if $p > 110$, $y = 0$ if $p < 110$.

(b) $y = p/5$ if $p > 108$, $y = 0$ if $p < 108$.

(c) $y = p/5$ if $p > 113$, $y = 0$ if $p < 125$.

(d) $y = p/10$ if $p > 113$, $y = 0$ if $p < 113$.

(e) $y = p/5$ if $p > 115$, $y = 0$ if $p < 105$.

12. When Farmer Hoglund applies N pounds of fertilizer per acre, the marginal product of fertilizer is $1 - (N/200)$ bushels of corn. If the price of corn is $3 per bushel and the price of fertilizer is $0.90 per pound, then how many pounds of fertilizer per acre should Farmer Hoglund use in order to maximize his profits?

(a) 140

(b) 280

(c) 74

(d) 288

(e) 200