Class Test I: Applied Economics [Odd Semester: August-December 2019]

Department of Humanities and Social Sciences
The LNM Institute of Information Technology

Marks: 10 **Weightage: 10%**
Date: 11th September, 2019 **Time: 30 Minutes**

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General Instructions: Please read them carefully

1. There is *only one* correct answer to the multiple-choice questions;
2. There is *no* negative marking;
3. All question carries 1 mark each.

Q. 1. Which of the following *best* describes an isoquant?

a. Isoquant are always downward sloping
b. Isoquant are always convex to the origin
c. Along an isoquant change of output is zero •
d. Law of diminishing marginal rate of technical substitution does not hold for an isoquant

Q.2 When will a firm operating in short run in a perfectly competitive market *shut down* its operations?

a. Price is equal to the Marginal Cost of Production
b. Total revenue is greater than Total Variable Costs
c. Price is greater than equal to the Average Cost of Production
d. Price is less than the Average Variable Cost of Production

Q. 3 Input demand functions derived from profit functions are better than those derived from the usual constrained optimization problem of minimize cost subject to output constraint or maximize output subject to cost constraint. The reason being: input demand functions derived from profit functions provide the information that how prices of products affect input demand.

a. True •
b. False

Q. 4 For a typical production function of the form $Q = f(k, l)$, which is of the following formula defines elasticity of substitution?

a. $\sigma = \dfrac{d\ln(MRTS)}{d\ln(k/l)}$

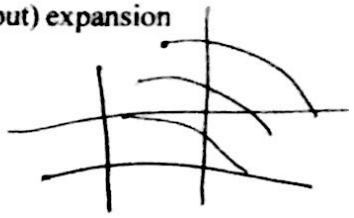
b. $\sigma = \dfrac{d(MRTS)}{d(k/l)}\dfrac{(MRTS)}{(k/l)}$

c. $\sigma = \dfrac{d(k/l)}{d(MRTS)}\dfrac{(MRTS)}{(k/l)}$ •

d. $\sigma = \dfrac{d(k/l)}{d(MRTS)}\dfrac{(k/l)}{(MRTS)}$ •

Q. 5 A firm using capital (k) and labour (l) for production. Every point on its (output) expansion path will depict that

a. Marginal product of labour is highest
b. Marginal product of capital is lowest
c. The slope of isoquant and isocost line are same
d. The slope of isoquant and isocost line are not the same



Q. 6 A firm's production function is given as $Q = \min\left\{\frac{k}{5}, \frac{l}{10}\right\}$ and the wage rate is Rs. 2 while the rent of capital is Rs. 4. The firm has also a (total) cost constraint of Rs. 1000. What is the optimal amount of capital and labour will the firm hire?

a. $k = 100$ and $l = 300$
b. $k = 125$ and $l = 250$
c. $k = 250$ and $l = 0$
d. $k = 0$ and $l = 500$

Q. 7 Suppose that the production function is of the form $Q = \left(L^{\alpha} + K^{\alpha}\right)^{\beta}$; where α and β are positive constants. For what values of α and β are there decreasing returns to scale?

a. $\alpha\beta < 1$
b. $\alpha\beta = 1$
c. $\alpha\beta > 1$
d. None of the above

$\beta\left(\alpha l^{\alpha-1} + k^{\alpha}\right)^{\beta-1}$

Q.8 The production function for widgets is given by $Q = kl - 0.8k^2 - 0.2l^2$ where Q represents annual quantity of widgets produced, k represent the annual capital input, and l represents annual labour input. Suppose $k = 10$, at what labour input will the marginal productivity of labour be equal to zero?

Ans: 25

Q. 9 If labour is the only variable factor used in the production of a good, and if the marginal product of labour is 4 and the price of labour is 5, then the marginal cost of producing the good is

a. 4/5
b. 5/4
c. 1
d. None of the above

Q. 10 A competitive firm has the following short run total cost function $TC(Q) = Q^3 - 80Q^2 + 30Q + 5$. At what level of output would the average variable cost curve intersect the marginal cost curve (or both be equal)?

Ans: 40

$Q = \frac{1}{3}, 40.$

$3Q^2 - 160Q + 30$

$3Q^2 - 120Q - 40Q + 30$

$3Q^2 - 180Q + 20Q - 1$

$3Q(Q - 40) - 1($

$k - 0.4l = 0$

$\frac{100}{4} = l$