



M 7422

Reg. No. :

Name :

III Semester B.A. Degree (CCSS-Reg./Supple./Imp.)
Examination, November 2014
COMPLEMENTARY COURSE IN ECONOMICS
3C03 ECO : Mathematical Economics - I
(2011 and Earlier Admissions)

Time: 3 Hours

Max. Weightage : 30

Instruction : Answer may be written either in **English** or in **Malayalam**.

PART - A

Objective type questions (in bunches of **two**). Choose the correct answer.

1. An increase in the price of a commodity when demand is inelastic causes the total expenditures of the consumers of the commodity to
 - a) increase
 - b) decrease
 - c) remain unchanged
 - d) any of the above
2. When the law of diminishing returns begins to operate, the TVC curve begins to
 - a) fall at an increasing rate
 - b) rise at an increasing rate
 - c) fall at a decreasing rate
 - d) rise at a decreasing rate
3. When the perfectly competitive firm and industry are both in LR equilibrium ?
 - a) $P = MR = SMC$
 - b) $P = MR = SAC = LAC$
 - c) $P = MR =$ lowest point on the LAC curve
 - d) all the above
4. At the shutdown point
 - a) $P = AVC$
 - b) $TR = TVC$
 - c) The total losses of the firm = TFC
 - d) All the above

(Weightage : 1)

P.T.O.



II

5. If $P = ₹ 2$ at the point on the demand curve where $e = 1$, MR is
- ₹ 5
 - ₹ 0
 - ₹ 1
 - ₹ 10
6. The statement $C = D = 10$ utilities implies
- an ordinal and a cardinal measure of utility only
 - a cardinal measure of utility only
 - an ordinal and a cardinal measure of utility
 - none of the above
7. The Engel curve for a Giffen good is
- negatively sloped
 - positively sloped
 - vertical
 - horizontal
8. Short run TC can never be less than long run TC
- always true
 - often true
 - sometimes true
 - never true

(Weightage : 1)

PART - B

(Short answer questions)

Answer **any ten** questions of the following not exceeding **50 words each**.
Each question carries **1** weightage.

9. Define own price elasticity of demand. Obtain the own price elasticity from the demand curve $q = \frac{27}{p^3}$.
10. Define static stability.
11. Explain the relationship among price elasticity of demand with MR and AR.
12. What is translog function ?
13. Explain cost minimising method.

14. Cobb Douglas production function.
15. Define equilibrium price.
16. Constant returns to scale.
17. Indirect utility function.
18. Elasticity of substitution.
19. For the production function, $q = x_1 x_2 - 0.2x_1^2 - 0.88x_2^2$, find MP of x_1 .
20. Define perfect competition market. **(Weightage : 10×1=10)**

PART – C

(Short Essay)

Answer **any five** questions not exceeding **150 words each**. Each question carries **2** weightage.

21. The long run cost function for each firm that supplies Q is $C = q^3 - 4q^2 + 8q$. Firms will enter the industry if profits are positive and leave the industry if profits are negative. Describe the industry's long run supply function. Assume that the corresponding demand function is $D = 2000 - 100P$. Determine equilibrium price, aggregate quantity and number of firms.
22. Examine the nature of utility function.
23. Prove that elasticity of demand at different points on same demand curve is different.
24. Derive the expression for produces demand.
25. Let duopolist I, producing a differentiated product, face an inverse demand function given by $P_1 = 100 - 2q_1 - q_2$ and have the cost function $C_1 = 2.5q_1^2$. Assume that duopolist-II wishes to maintain a market share of $\frac{1}{3}$. Find the optimal price, output and profit for duopolist I. Find the output of duopolist II.



26. Solve the homogeneous second order differential equation $\frac{d^2y}{dt^2} + 8\frac{dy}{dt} + 7y = 0$.

27. Explain constant returns to scale using Cobb-Douglas production function.

(Weightage : $5 \times 2 = 10$)

PART - D

(Long Essay)

Answer **any two** questions not exceeding **450** words. **Each** question carries **4** weightage.

28. Derive demand curve from the analysis of utility maximisation and prove the important properties.

29. Derive the Slutsky equation and show that price effect is the combination of income effect and substitution effect. With regard to the Slutsky and Hicksian substitution effects, which is the best measure?

30. For the production function, $q = f(x_1, x_2)$ and cost function, $C = r_1x_1 + r_2x_2 + b$, $r_1 =$ price of x_1 , $r_2 =$ price of x_2 , $b =$ price of fixed inputs, derive the first order and second order condition for output maximisation.

31. What is monopoly? Explain the total and marginal approach of short-run equilibrium under monopoly.

(Weightage : $2 \times 4 = 8$)