



PART – D

Answer **any two** questions. **Each** question carries **10** marks. **No** answer should exceed **6** pages.

26. Explain the properties CES production function. Point out its merits and demerits.
27. Prove that Cournot solution is stable using a mathematical example.
28. Find solution to the linear programming problem :
 Maximize $Z = X_1 + 1.5X_2$
 Subject to the Constraint $2X_1 + 2X_2 \leq 16$
 $X_1 + 2X_2 \leq 12$
 $4X_1 + 2X_2 \leq 28$
 $X_1, X_2 \geq 0$.
29. Discuss the static and dynamic input output model. (2×10=20)



Reg. No. :

Name :

IV Semester M.A. Degree (CBSS – Reg./Suppl./Imp.) Examination, April 2020
(2014 Admission Onwards)
ECONOMICS/DEVELOPMENT ECONOMICS
ECO 4E 15 : Mathematical Economics

Time : 3 Hours

Max. Marks : 60

PART – A

Answer **all** questions. **All** questions carry **equal** marks.

- A profit maximizing, oligopolistic firms produces at an output level where

A) $P = ATC$	B) $MR = MC$
C) $MR = ATC$	D) $AVC > MR$
- At the point of consumer equilibrium

A) The indifference curve is tangent to the budget line	B) The MRS_{xy} equals P_x/P_y
C) $MU_x/P_x = MU_y/P_y$	D) All the above
- The output elasticity of labour measures

A) $(\Delta Q)/(\Delta L)$	B) $(\% \Delta Q)/(\% \Delta L)$
C) $(\Delta L)/(\Delta Q)$	D) $(\% \Delta L)/(\Delta L)$
- If total revenue, $TR = 100 - 100 Q^2$, then what is the marginal revenue ?

A) $100 Q^2$	B) $100 Q$
C) $200 Q$	D) $200 Q^2$



5. Games in which gains of one player equal the losses of the other are called
- A) Zero-sum games B) Non-zero-sum games
C) Prisoner's dilemma D) Pure strategy
6. Given the Cobb-Douglas Production function $Q = A K^\alpha L^\beta$, A refers to
- A) Managerial efficiency
B) Marginal productivity
C) Marginal profit
D) Marginal revenue
7. In linear programming, most popular non-graphical procedure is classified as
- A) Linear procedure B) Non-graphical procedure
C) Graphical procedure D) Simplex method
8. Given a supply function, $q = -0.06 p^2 + 2p - 5$, find arc elasticity of supply when price 'p' decreases from 11 to 10.
- A) 0.64 B) 0.74 C) 0.84 D) 0.94 (8×½=4)

PART – B

Answer **any eight** questions. **Each** question carries **2** marks. **No** answer should exceed **one** page.

9. What is meant by linear homogeneous production function ?
10. Define elasticity of substitution.
11. Maximize utility function $U = f(XY)$ subject to the constraint $5X + 2Y$. Obtain the equilibrium quantity of X and Y.
12. Prepare a note on Hawkins – Simon condition.
13. What is an indirect utility function ?



14. Convert the following primal problem into dual problem :

$$\text{Max } 4X + 6Y$$

$$\text{S.A. } 2X + 4Y \leq 12$$

$$4X + 3Y \leq 16$$

$$X \geq 0, Y \geq 0.$$

15. What is input-output analysis ?
16. Explain fixed coefficient production function.
17. Illustrate additivity assumption using an example.
18. Define Euler's Theorem.
19. Find elasticity of supply for supply function $X = 2P^5 + 5$ when $P = 3$. (8×2=16)

PART – C

Answer **any four** questions. **Each** question carries **5** marks. **No** answer should exceed **2½** pages.

20. Determine the profit maximizing condition of a multi plant monopolist.
21. Solve the following problem by simplex method
- $$\begin{aligned} \text{Maximize } Z &= 5X_1 + 4X_2 \\ \text{Subject to } X_1 + 2X_2 &\leq 8000 \\ 3X_1 + 2X_2 &\leq 9000 \\ X_1, X_2 &\geq 0. \end{aligned}$$
22. What are the major limitation of Cobb-Douglas production function ?
23. Discuss the significance of Roy's identity.
24. Optimize the given utility function $U = X^2 + Y^2$ subject to the constraint $Y = 10 - X$.
25. Explain the meaning and properties of variable Elasticity Substitution production function. (4×5=20)