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TM247394J

Reg. No: .....

Name: .....

INTEGRATED M A PROGRAMME IN SOCIAL SCIENCES – ECONOMICS(C.S.S) EXAMINATION, AUGUST 2024

(2020 Admission Regular Accelerated Semester)
SEMESTER VII - CORE COURSE (ECONOMICS)
EC07C32IM20 – MATHEMATICAL ECONOMICS FOR ADVANCED STUDIES

Time : 3 Hours **Maximum Weight : 30**

Part A

Answer any Eight questions. Each question carries 1 weight **(8x1=8)**

1. What is homogeneous function?
2. Calculate price elasticity of supply when q= 20+2p and price is 10. Also interpret the result achieved.
3. Find the MC and AC from TC = $q^3 - 4q^2 + 15q + 110$
4. Prove that Cobb Douglas production is constant returns to scale
5. Find the equilibrium price when Qd = 60-3p and Qs = -40 + 5p
6. When P= 100 – 2q and TC = 50+ 40q. Find the profit maximizing output in a monopoly
7. Write down the basic mathematical form of Philips curve.
8. What do you mean by inverse matrix?
9. Define linear programming.
10. State the difference between slack and surplus variables.

Part B

Answer any Six questions. Each question carries 2 weight **(6x2=12)**

11. Explain whether $f(x,y) = e^{x+y}$ is homogeneous and homothetic.
12. Derive the indirect utility function U=XY subject to PxX + PyY = M
13. When $q = 3k^{0.2} L^{0.8}$ whose budgetary constraints are Pk = 9 ,PL =4 and total budget is 450. Find the maximum output
14. Mathematically explain the Eulers theorem in the context of CES production function
15. Find the profit maximizing output under Cournot model when price is 180-2q and MC is 20
16. Find out the equilibrium of monopolistic competition using MR-MC and TR-TC approach when the inverse demand function is P = 85-4q with total cost of 24+13q
17. Find the inverse of $A = \begin{vmatrix} 4 & 5 \\ 7 & 6 \end{vmatrix}$
18. Write the dual for

    Minimise $z = x_1 + 6x_2$

    Subject to $x_1 + x_2 \leq 4$

    $2x_1 + 3x_2 \leq 8$

Part C

Answer any Two questions. Each question carries 5 weight **(2x5=10)**

19. When the indirect utility is given by $V = (0.2M/P_1)^{0.2} \times (0.8M/P_2)^{0.8}$ calculate the Marshallian demand using the roys identity.
20. Mathematically express all the properties of cobb douglas function

21. In a market Qd = 14-3p and Qs= -10+2p. If the change in price over time is equal to 4 times of excess demand. Test the stability of market price. Also demonstrate the cob web model mathematically and graphically to portray the time path.
22. Maximise $z= 8x_1 + 10x_2 -x_1^2 - x_2^2$ subject to $3x_1 +2x_2 \leq 6$ using Kuhn tucker condition