QP CODE: 25020916

25020916

Reg No : .....

Name : .....

B.A DEGREE (CBCS) REGULAR / REAPPEARANCE / MERCY CHANCE EXAMINATIONS, FEBRUARY 2025

Sixth Semester

CHOICE BASED CORE COURSE - EC6CBT01 - MATHEMATICAL ECONOMICS

Common for B.A Economics Model I, B.A Economics Model II Foreign Trade & B.A Economics Model II Insurance

2017 Admission Onwards

3489343D

Time: 3 Hours Max. Marks : 80

Part A

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. Give examples of a) Rational function b) Exponential function
2. Find $\lim_{x \to 4} 6$
3. Find the second-order derivative of the function $y = -x^6 + 2x^4 + x$
4. Given $TC = Q^2 + 3Q + 14$. Find MC.
5. Find the second order partial derivatives of $Z = x^2 - 3xy + 9y^2$
6. Explain the significance of Lagrange multiplier
7. What is meant by partial differentials?
8. Find the derivative for the inverse function dp/dQ
   1)$Q = 12p^2 + 5p + 12$ 2) $Q = p^4 + 2p^2 + 7p$
9. Find $\int$ (x+2)(x-2) *dx*
10. Find $\int$(3 x ^{4} + 2x +1) *dx*
11. Evaluate $\int_{-2}^{2}$ 2x^3 + 3x + 1 *dx*
12. Write theintegral formula for producers' surplus.

(10×2=20)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. Find the slope of the curvilinear function $f(x) = x^2 - 2x + 5$ at x=2.

14. Differentiate the following function using the product rule.
$y = (2x^4 + 5)(3x^5 - 8)$

15. Use implicit differentiation to find the derivative dy/dx of the equation
$2y^5 - 5y^4 + 4x^6 = 212$

16. Find partial derivatives for the following functions a) Z=
$8w^4 + 5wx + 3x^2 - 6xy + 7y^2$ b) P=$P = 2q^2 + 8qrs - 4r^3 + s^4$

17. Given Z=$x^3 + 4y$ and Y=$x^3 + 5x + 12$.Find the total derivative with respect to x

18. Find elasticity of supply from the following supply function
(a) X=$40 + 4p$ (b) $S = 5p^2 + 3p + 10$

19. Evaluate $\int_2^3$ $2x^2 + 9x + 6\ dx$

20. Find the total area between the region bounded by the x-axis and y = x1/3 -x , -1≤x≤8

21. Find the total area between the region bounded by the x-axis and y=3x2 -3 ,between 2≤x ≤2

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Graph the demand function $Q_d = -4P + 0.01Y - 5P_r + 10T$ when $Y = 8000, P_r = 8$ and $T = 4$. (b) What type of good is the related good? (c) What happens if T increases to 8, indicating a greater preference for the good? (d) Graph the new demand curve.

23. Use the rules of Partial differentiation to find the first order partial derivatives of the following functions
a) $Z = \frac{(6x^2 - 5y)(4x^2 + 9y)}{(3x + 2y)}$ b)$Z = (6x^3 - 5y^2)^2(3x + 7y^3)$

24. Find the critical points and test whether the following function is at a relative maximum or minimum?
Z=$5y^3 + 2x^2 + 11xy - 7y + 12$

25. (a)What do you mean by integration by substitution?

(b) Find $\int (2x^3 +1)(x^2)\, dx$

(b) Find $\int ex^3(x^2)dx$

(2×15=30)