

QP CODE: 24001158

Reg No : Name :

B.A DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, MARCH 2024 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

5554C077

Time: 3 Hours

Max. Marks : 80

Part A

Answer any **ten** questions. Each question carries **2** marks.

- 1. What is the difference between a function and a relation?
- 2. Find $\lim_{x o 2} 4x^2$
- 3. Find the derivative of $y = -9x^{-4}$
- 4. Find the equilibrium level of income Y = C + I when C = 68 + 0.8Y and $I_0 = 55$.
- 5. Find the partial derivative of the function S= $(x^2 + 6y^2)^4$
- 6. Find the second order partial derivatives of the function $Z = x^2 + x^3 y^3 2x^2 y + 7y^4$
- 7. Explain the significance of Lagrange multiplier
- 8. Find the derivative for the inverse function dx/dz 1) Z = 112 - 4x 2) $Z = 21 + 4x^2$
- 9. $\int_{\text{Find}} \int_{x(x+1)^2 dx}$
- 10. Find $\int (5x^3 + 7x^2 + 3) dx$
- 11. $\int_{-2}^{2} 2x^3 + 3x + 1 dx$
- 12. Write theintegral formula for producers' surplus.





 $(10 \times 2 = 20)$

Part B

Answer any six questions.

Each question carries 5 marks.

- 13. Graph the rational function $y = \frac{4}{x}$.
- 14. Find the slope of the curvilinear function $y = 2x^2 + 6x + 4$ at x = 5.
- 15. For the following function investigate the successive derivatives y = (7x - 4)(2x + 9)
- 16. What is meant by partial differentials?Given Z= $2x^4 + 13xy + 7y^2$ findout the total differential of the function?
- 17. Find the total derivative for the following functions 1) $Z=rac{(2x-2y)}{(3x+4y)}$ where y=x+3 2) $Z=11x^2-6xy-13y^2$ where y=2w and x=3w
- 18. Define total and marginal utility. Given the total utility function U= $6x^2 + 3xy + 7y^2$. Find MUx and MUy?
- 19.

Use integral by parts to evaluate the integral $\int e^{3x} x^2 dx$

20.

- $\int_{1}^{2} x^{5} + 4x^{2} + 5 dx$
- 21. Calculated the area bounded by the x-axis and the parabola $y = 4-x^2$

(6×5=30)

Part C

Answer any two questions.

Each question carries 15 marks.

- 22. The equation for the production isoquant is $36K^{3/5}L^{2/5}=6328.$ a) Find the MRTS and (b) Evaluate it at K = 257, L = 168
- 23. Use the rules of Partial differentiation to find the first order partial derivatives of the following functions

a)
$$Z=rac{(6x^2-5y)(4x^2+9y)}{(3x+2y)}$$
 b) $Z=(6x^3-5y^2)^2(3x+7y^3)$





- 24. For the following quadratic functions 1)find the critical points at which the function may be optimised and 2) determine whether at these points the function is maximised ,is minimised ,is at an inflection point or at a saddle point? $Z = 3x^2 - xy + 2y^2 - 4x - 7y + 12$
- $25. \quad (a) \ Explain \ how \ integration \ can \ be \ used \ to \ find \ the \ area \ between \ two \ curves$
 - (b) Find the areas of the regions enclosed by the curves $y=2x x^2$ and y=-3

(2×15=30)