24027838

QP CODE: 24027838

Reg No : .....

Name : .....

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

Third Semester

B.A Economics Model I

COMPLEMENTARY COURSE - MM3CMT04 - MATHEMATICS - GRAPHING FUNCTIONS, EQUATIONS, DIFFERENTIAL CALCULUS AND LOGARITHMIC AND EXPONENTIAL FUNCTIONS

2017 Admission Onwards

34032B33

Time: 3 Hours Max. Marks : 80

Part A

*Answer any **ten** questions.*

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

1. Add $\frac{2}{5x} + \frac{3}{2x}$.
2. Write the equation of a straight line passing through the points (1,2) and (5,3).
3. Define profit function.
4. Define break-even point .
5. Solve $x^2 - 5x + 6 = 0$ by factorisation.
6. Give an example of an implicite function.
7. Find the derivative of $y = 4e^x - x + 2$.
8. Find $\frac{dy}{dx}$ if $x^2 + y^2 = 4$.
9. Give an example of an increasing function.
10. Define exponential function.
11. Convert $y = \ln\left(\frac{x^4y^2}{z^5}\right)$ into sums, differences or products.

12. Find the derivative of $\ln 2x$.

(10×2=20)

Part B

*Answer any **six** questions.*

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

13. Solve the linear equation $4(2x+9) = 6(5x-21) - 1$.
14. Find the equation of the straight line passing through the point (1,2) and parallel to the line having equation $y + 3x = 4$.
15. Draw the graph of the quadratic function $y = -2x^2 + 16x + 8$.
16. Write a short note on IS-LM analysis.
17. Find $\lim_{x \to 2} \dfrac{x^2 - 5x + 6}{x^2 - 4}$.
18. Find the derivative of $y = \dfrac{3x^2 - 5}{2x^3 - 3}$.
19. Find the total cost of producing 20 units of output for a firm that has fixed cost of $ 3500 and marginal cost $ 400 per unit.
20. Solve the equation $\log_x(3x-2) = 2$ for x.
21. Find the compound interest for Rs.10,000 at the rate of 10% for 2 years compounded half yearly.

(6×5=30)

Part C

*Answer any **two** questions.*

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

22. (a) Find the equation of the straight line passing through (-1, 2) and perpendicular to the line $6x - 2y + 8 = 0$

    (b) Draw the graph of the linear function $y = 3x - 4$.

    (c) Find the equation of the straight line passing through (2,3) having slope $\dfrac{1}{2}$.

23. (a). The demand function of a monopolist firm is $P = 15 - 2x$ and the cost function is $C(x) = x^2 + 2x$ Find (i) Total Revenue(ii) Marginal revenue(iii) Marginal Cost (iv) Average Cost

    Also evaluate them when the output x=4 units

    (b). If $f(x) = 3x^2 - 7x + 8$ and $g(x) = 9x - 4$. Find

    $(i)(f+g)(x)$ (ii) $(f.g)(x)$ (iii) $(f \circ g)(x)$ and (iv) $(g \circ f)(x)$.

24. (a) Find the relative extrema and optimise the function
$f(x) = 3x^3 - 45x^2 - 675x + 13.$
(b) Find the successive derivatives of the function
$f(x) = 3x^4 - 5x^3 + 8x^2 - 7x - 13 \text{ at } x = 0.$

25. (a) Find the compound interest for Rs.16,000 at the rate of 12% for 2 years compounded half yearly and quarterly.
(b) The price of a car depreciates at the rate of 5% per year. If the present value of the car is Rs.5,00,000. then what will be its value after 5 years.

(2×15=30)