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Name.....94.....

Reg. No.....

**FIFTH SEMESTER B.A./B.Sc./B.Com. DEGREE EXAMINATION
NOVEMBER 2015**

(U.G.—CCSS)

Open Course—MM 5D 03—MATHEMATICS FOR SOCIAL SCIENCES

Time : Three Hours

Maximum : 30 Weightage

Part A

Answer all the twelve questions.

1. Find the y-intercept of the line $5y = 35 - 3x$.
2. Solve $\frac{x}{2} - \frac{x}{3} = 2$.
3. General form of a linear function is $f(x) = \text{-----}$.
4. If $f(x) = x^2 + 3x + 5$, then $f(a - 2)$ is ----- .
5. Identify the domain of $f(x) = \frac{5}{\sqrt{x}}$.
6. If $f(x) = 6x - 5$; $g(x) = 8x - 3$ then $(f + g)(x)$ is ----- .
7. Evaluate $\lim_{x \rightarrow 4} \frac{x - 4}{x^2 - 16}$.
8. State True or False "a polynomial function is continuous".
9. Evaluate $\lim_{x \rightarrow \infty} \frac{x + 2}{x - 5}$.
10. If $f = 8x^2y^4$ find f_x and f_y .
11. Evaluate $\int x^3 dx$.
12. Evaluate $\int e^{3x} dx$.

(12 × ¼ = 3 weightage)

Turn over

Part B

Answer all the **nine** questions.

13. Find the slope of the line joining (1, 7) and (5, 15).
14. Solve $11x^2 + x - 12 = 0$.
15. Find the domain and Range of the function $y = x^2$.
16. Is the relation $x^2 + y^2 = 1$ function? Justify your answer.
17. Examine the continuity of $f(x) = 14x + 6$ at $x = 3$.

18. Find the slope of $y = \frac{1}{x}$ at (1, 1).

19. If $x^2 + y^2 = 1$ find $\frac{dy}{dx}$.

20. Evaluate $\int \frac{1}{4x+3} dx$.

21. If $f = 4x^2y^3$ find f_{xx} at (1, 1).

(9 × 1 = 9 weigh

Part C

Answer any **five** questions.

22. Solve $-5x + y = -8$; $6x - y = 11$.
23. Find the equation of a line passing through (-2, 5) and parallel to $y = 3x + 7$.
24. If $f(x) = x^3$ and $g(x) = x^2 - 2x + 5$, find $f(g(x))$ and $g(f(x))$.
25. Use the delta process to find the derivative of $f(x) = \sqrt{x}$ at $x = 16$.
26. Determine whether $y = \frac{7x-9}{2x}$ ($x \neq 0$) is increasing or decreasing at $x = 3$.
27. Find the 1st order partial derivatives $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$ if $f(x, y) = 7x^3(4x + 9y^2)$.

28. Evaluate $\int 3x^2(x^3 + 7)^5 dx$.

(5 × 2 = 10 weigh

Part D

Answer any two questions.

29. (a) Revenue function is $R = 25x$ and cost function is $C = 15x + 120$, find the break-even point.

(b) If $f(x) = \frac{x-5}{x+3}$; $g(x) = \frac{2x}{x-1}$ ($x \neq -3, 1$) find $(f-g)(x)$.

30. (a) Given the average cost function $A = 6Q + 9 + \frac{120}{Q}$, find the marginal cost function.

(b) Evaluate $\int (6x^2 + 8x + 3) dx$.

31. (a) Find the cross partial derivatives f_{xy} and f_{yx} if $f = 5x^3y^2 - 10x^2y^4$.

(b) Evaluate $\int xe^x dx$.

(2 × 4 = 8 weightage)