70946 (Pages : 3) Name.....

Reg. No.....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2014

(U.G.–CCSS)

Open Course—Mathematics

MM 5D 03—MATHEMATICS FOR SOCIAL SCIENCES

Time : Three Hours Maximum : 30 Weightage

Part A

Answer all the **twelve** *questions.*

1. Find the x-intercept of $3x + 2y = 1$.

2. Solve : $\frac{x}{2} - \frac{x}{3} = 4$.

3. State True *or* False. "For real numbers a, b, c with $a = b$, then $ac = bc$".

4. If $f(x) = x^3 + 5x - 6$, then $f(3) + f(-3)$ is _____.

5. Evaluate : $\lim_{x \to 3} \frac{x-3}{x^2-9}$.

6. If $y = \left(x^2 + 1\right)^7$, then $\frac{dy}{dx}$ is _____.

7. Evaluate : $\int \frac{1}{x+3}\, dx$.

8. If $f(x, y) = 11x^4y^7$, then $\frac{\partial f}{\partial x}$ is _____.

9. If $f = e^{x^2y^2}$ find $\frac{\partial f}{\partial y}$.

10. A point where the derivative of $f(x)$ equals zero or is undefined is called _____.

Turn over

11. If $f = x^2 + xy + y^2$, find f_{xx}.

12. Evaluate : $\int 2e^{x^2} x\, dx$.

(12 × ¼ = 3 weightag

Part B

Answer all the **nine** *questions.*

13. Find the equation of the line passing through (6, – 4) and having slope $\frac{1}{2}$.

14. Solve $x^2 + 12x + 32 = 0$.

15. Write the range of $f(x) = 3x - 2; -2 \le x \le 2$.

16. If $f(x) = x^3$ and $g(x) = x + 3$ find $f(g(x))$.

17. Examine the continuity of $f(x) = \sqrt{x+5}$ at $x = 11$.

18. Evaluate : $\underset{x \to 3}{\text{Lt}} \frac{\sqrt{x} - \sqrt{3}}{x - 3}$.

19. Write the equation of the tangent line to $y = x^2 - 2$ at (3, 7).

20. Find $\frac{dy}{dx}$ if $y = \frac{1}{x^2 + 1}$.

21. Evaluate : $\int \sqrt{x+1}\, dx$.

(9 × 1 = 9 weight

Part C

Answer any **five** *questions.*

22. Solve $\frac{1}{2}x + y = 7 ; x + 3y = 15$.

23. Find the equation of a line passing through (8, 3) and perpendicular to the line $y = 4x + 13$.

24. If $f(x) = x + 3 ; g(x) = 4x^2 - 5x + 1$ find $f(g(x))$ and $g(f(x))$.

25. Write the equation if the tangent line to $y = 2x^2 - 3$ at (2, 5).

26. Use implicit differentiation to find $\frac{dy}{dx}$ for the function $2y^3 - 5y^2 + 7x^5 = 102$.

27. Evaluate : $\int_1^2 (6x^2 + 8x)dx$.

28. If $f(x,y) = 4x^6 - 3x^2y^2 + 5y^4$; find $\frac{\partial^2 f}{\partial x^2}$ and $\frac{\partial^2 f}{\partial y^2}$.

(5 × 2 = 10 weightage)

Part D

Answer any **two** *questions.*

29. (a) Does the equation $y^2 = x$ represents a function. Justify your answer.

(b) If $y = \frac{7x^3}{4x+9}$, find $\frac{dy}{dx}$.

30. (a) Find the marginal revenue function for the supply function $P = Q^2 + 4Q + 9$.

(b) Find $\frac{dy}{dx}$ if $x^2 + xy + y^2 = 1$.

31. (a) Find the cross partial derivatives f_{xy} and f_{yx} if $f = 4x^4 - 12x^2y^2 - 5y^3$.

(b) Evaluate : $\int (x+1)e^x dx$.

(2 × 4 = 8 weightage)