

C 30311

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Name.....

Reg. No.....

FIFTH SEMESTER B.A./B.Sc./B.Com./B.B.A. DEGREE EXAMINATION
NOVEMBER 2017

(CUCBCSS—UG)

Open Course

MAT 5D 19—MATHEMATICS FOR SOCIAL SCIENCES

Time : Two Hours

Maximum : 40 Marks

Section A

Answer all the **six** questions.

Each question carries 1 mark.

1. Find the x -intercept of the equation $y = 9x - 72$.
2. Evaluate $\lim_{x \rightarrow 7} \frac{x-7}{x^2-49}$.
3. When a function $f(x)$ is said to be increasing.
4. Find the partial derivative $\frac{\partial z}{\partial y}$ if $z = 4x^3 + 2x^2y - 7y^5$.
5. Find the marginal cost function if the average cost function $AC = \frac{160}{Q} + 5 - 3Q + 2Q^2$.
6. Convert the exponential form $64 = 16^{3/2}$ into equivalent logarithmic form.

(6 × 1 = 6 marks)

Section B

Answer any **five** out of seven questions.

Each question carries 2 marks.

7. Verify whether the function $f(x) = 5x^2 - 8x + 9$ is continuous at $x = 3$.
8. Find the equation for the line passing through $(-3, 6)$ and parallel to the line having the equation $y = 5x + 8$.
9. Find the derivative of $y = x \log_e x$.
10. Find the differential of the function $z = 5x^3 - 12xy - 6y^5$.

Turn over

11. Integrate $\sqrt{3x^2 - 4}$ (6x) with respect to x .

12. Evaluate $\int_0^3 (4e^{2x}) dx$.

13. If $\log_2 x + \log_4 x + \log_{16} x = \frac{21}{4}$, find x

(5 × 2 = 10 marks)

Section C

Answer any **three** out of five questions.
Each question carries 4 marks.

14. Differentiate $y = (\sqrt{x})^{\sqrt{x}}$.

15. Evaluate $\lim_{x \rightarrow 0} \frac{(\sqrt{2+x^2}) - (\sqrt{2-x^2})}{x^2}$.

16. Find the cross partial derivatives z_{xy} and z_{yx} for the Cobb-Douglas function $z = 1.4x^{0.2}y^{0.7}$.

17. Find the relative extrema for the function $f(x) = -9x^2 + 126x - 45$.

18. Find the total revenue between 0 to 10 units of output (x) from the marginal revenue given by $MR = 3(x^2/20) - 10x + 100$.

(3 × 4 = 12 marks)

Section D

Answer any **two** out of three questions.
Each question carries 6 marks.

19. Use integration by parts to find the indefinite integral $\int \frac{9x}{\sqrt{x+23}} dx$.

20. A monopolist has a demand curve $Q = 106 - 2P$ and average cost curve $AC = 5 + \frac{Q}{50}$ where P is the price per unit output and Q is the number of units of output. If the total revenue is $R = PQ$, determine the cost profitable output and maximum profit.

21. (a) Evaluate $\int \frac{x^3}{x^2 + 8x + 12} dx$.

(b) Differentiate x with respect to x^3 .

(2 × 6 = 12 marks)