

M 2065

V Semester B.A./B.Sc./B.Com./B.B.A./B.B.A.T.T.M./B.B.M./B.C.A./B.S.W./ B.A. Afsal UI Ulama Degree (CCSS – Reg./Supple./Improv.) Examination, November 2012 OPEN COURSE IN MATHEMATICS 5D01 MAT : Business Mathematics

Time: 2 Hours

Max. Weightage: 20

Instruction : Answer to all questions.

PART-A

This Part consists of **two** bunches of questions carrying **equal** weighage of **one**. **Each** bunch consists of **four** objective type questions. Answer **all** questions.

Fill in the blanks :

1. A fun f(x) is said to be even if f(-x) = -

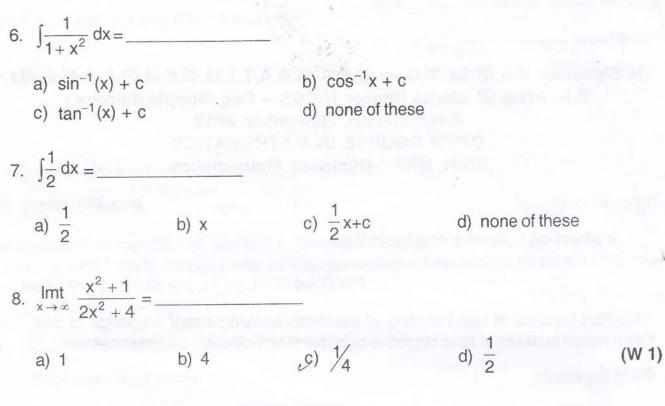
- 2. $\lim_{x \to 0} \frac{a^x 1}{x} =$
- \bigcirc 3. $\frac{d}{dx}(\sqrt{x}) =$
 - 4. $\lim_{x \to 0} \left(\frac{x+2}{x-2} \right) =$ _____

Choose the correct answer for the following :

5.
$$\frac{d}{dx} (e^{mx}) =$$

a) e^{mx} b) me^{mx} c) m d) none of these

(W 1)



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Answer any six from the following (Weightage one each).

9. Draw the graph of the function y = |x|.

10. Integrate log x with respect to x.

11. Find
$$\frac{dy}{dx}$$
 if $y = x^x$.

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12. Find
$$\frac{dy}{dx}$$
 if $y = x^3 e^x$.

13. Differentiate with respect to x f(x) = $\frac{x^3 + 3x^2 - 4}{x}$.

14. Integrate with respect to x ; $\sqrt{3x^2 - 4}$.6x.

15. Evaluate
$$\int \frac{x^5 + 8x^2 + 1}{x^2} dx$$

16. Find
$$\lim_{x \to \infty} \frac{1^2 + 2^2 + 3^2 + ... + x}{x^3}$$

- 17. The demand for a certain product is represented by the equation $p = 20 + 5q q^2$. Where q is the number of units demanded and p is the price per unit. Find marginal revenue function.
- 18. Write the condition for a function y = f(x) to have a local minimum at x. (6×1=6)

Answer any four questions. Each carries a weightage of two.

- 19. Find the points of discontinuity of the function $f(x) = \frac{x^2 + 2x + 5}{x^2 3x + 2}$
- 20. Find the gradient of the curve $y = 3x^2 5x + 4$ at the point (1, 2).
- 21. Evaluate $\int \frac{x^2}{x+1} dx$
- 22. Evaluate $\int x e^x dx$.
- 23. The total cost C(x) associated with producing and marketing x units of an item is given by $C(x) = 0.005x^3 0.02x^2 30x + 3000$. Find :
 - i) Total cost when output is 4 units.
 - ii) Average cost of output of 10 units.
- 24. Kapil deposited some amount in a bank for $7\frac{1}{2}$ years at the rate of 6% per annum (simple interest). Kapil received Rs. 101500 at the end of the term. Compute the initial deposit of Kapil.

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25. If f'(x) = 8x + 1 and f(0) = 0 find f(z).

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

PART-D

Answer any one from the following (Weightage four) :

- 27. Is the function f(x) = |x| continuous at x = 0.
- 28. Suppose a manufacture can sell x items per week at a price P = 20 0.001x rupees each when it costs, y = 5x + 2000 rupees to produce x items. Determine the number of items he should produce per week for maximum profit.
- 29. Compute the compound interest on Rs. 4,000 for $1\frac{1}{2}$ years at 10% per annum compounded half yearly. (1×4=4)

(4×2=8)

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