



M 2065

Reg. No. :

Name :



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. $\lim_{x \rightarrow 0} \frac{a^x - 1}{x} =$ _____

3. $\frac{d}{dx} (\sqrt{x}) =$ _____

4. $\lim_{x \rightarrow 0} \left(\frac{x+2}{x-2} \right) =$ _____

(W 1)

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

P.T.O.



6. $\int \frac{1}{1+x^2} dx =$ _____

a) $\sin^{-1}(x) + c$

b) $\cos^{-1}x + c$

c) $\tan^{-1}(x) + c$

d) none of these

7. $\int \frac{1}{2} dx =$ _____

a) $\frac{1}{2}$

b) x

c) $\frac{1}{2}x + c$

d) none of these

8. $\lim_{x \rightarrow \infty} \frac{x^2 + 1}{2x^2 + 4} =$ _____

a) 1

b) 4

c) $\frac{1}{4}$

d) $\frac{1}{2}$

(W 1)

PART - B

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 $y = x^x$.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 ; $\sqrt{3x^2 - 4} \cdot 6x$.



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

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

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)

PART - C

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.



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

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

(4×2=8)

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)