



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** weightage 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)