

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-ul-Ulama Degree (CCSS-Reg./Supple./Imp.)
 Examination, November 2014
 Open Course
 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.

I. 1) The domain of the absolute value function $y = |u|$ is _____

2) $\lim_{x \rightarrow 0} \frac{\log(1+x)}{x} = \underline{\hspace{2cm}}$

3) If u and v are any functions of x then $\frac{d}{dx}(uv) = \underline{\hspace{2cm}}$ 4) For points of local maximum $\frac{dy}{dx} = 0$ and $\frac{d^2y}{dx^2}$ is _____ (W. = 1)

II. 5) $\int 1 dx = \underline{\hspace{2cm}}$

6) $\int e^{mx} dx = \underline{\hspace{2cm}}$

7) If the rate of interest r_1 % for first n_1 years and r_2 % for the next n_2 years and r_3 % for next n_3 years, then amount due is _____.

8) $\int [(\text{Marginal Revenue}) - (\text{Marginal Cost})] dx + k. = \underline{\hspace{2cm}}$ (W. = 1)



PART - B

Answer **any six** questions in **one** or **two** sentences **each**. Each questions carries a weightage of **one**.

- 9) Evaluate $\lim_{x \rightarrow 0} \frac{\sqrt{1+x} - \sqrt{1-x}}{x}$.
- 10) Discuss the continuity of $f(x) = \frac{|x|}{x}$ at $x = 0$.
- 11) Differentiate $2x^4 + 3x^3 - 6x^{2/3} + \frac{1}{\sqrt{x}}$ with respect to x .
- 12) Find $\frac{dy}{dx}$ if $y = \frac{\sqrt{x} - 1}{\sqrt{x} + 1}$.
- 13) Evaluate $\int (x^2 + 1)(2x^3 - 3) dx$.
- 14) Evaluate $\int x e^{ax} dx$.
- 15) What is the effective rate of interest if the nominal rate is 5% p.a and is convertible quarterly ?
- 16) If the demand function is $p = 16 - x^2$, find consumer surplus.
- 17) The supply function of a product is $y = 3x^2 + 6$. Find the producer's surplus when 10 units are supplied.
- 18) How can $\frac{a}{r}$ be taken as the present value of an income stream of Rs. a per annum for ever when interest at 100r per cent is compounded yearly ? **(W. = 6×1=6)**



PART - C

Answer any 4 questions. Each carries wt. - 2

19) Evaluate $\lim_{x \rightarrow \infty} \frac{(x+1)(2x+3)}{(x+2)(3x+4)}$.

20) Show that the function $f(x) = 3x^2 + 2x - 1$ is continuous at $x = 2$.

21) If $f(x+y) = f(x)f(y)$ for all x and y and $f(5) = 2$ and $f'(0) = 3$ and find $f'(5)$.

22) If $y = ae^{mx} + be^{-mx}$ prove that $\frac{d^2y}{dx^2} - m^2y = 0$.

23) A company has a demand curve given by the function $2Q + 3P = 160$. The average cost curve of the firm is given by $AC = 3Q^2 + 18Q + 63 + \frac{5}{Q}$. Find the level of output which maximise the total revenue.

24) Evaluate the integral $\int x^3 e^{x^2} dx$.

25) The marginal cost function of a firm is given by $MC = 3000 e^{0.3x} + 50$ when x is quantity produced. If fixed cost is Rs. 80,000 find the total cost function of the firm.

26) Ram deposited a sum of Rs. 10,000/- in a bank. After 2 years, he withdrew Rs. 4,000/- and at the end of 5 years he received an amount of Rs. 7,520/-. Find the rate of simple interest.

(W. = 4x2=8)



PART - D

Answer any one. Wt - 4.

27) A machine costing Rs. 20,000/- is sold for Rs. 5,000/- down and the balance payable is semi annual installments in the next five years. What is this instalment if interest is :

- 1) 4% compounded semi-annually.
- 2) 4% compound annually ?

28) For a certain establishment the total cost function C and the total revenue function R are given by $C = x^3 - 12x^2 + 48x + 11$ and $R = 83x - 4x^2 - 21$ where $x =$ output. Obtain the output for which profit is maximum and the maximum profit.

29) If $x^y + y^x = a^b$ find $\frac{dy}{dx}$.

(W. = 1×4=4)
