

- b) Solve the following equations for x , y and z , using Crammar's Rule.

$$\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4$$

$$\frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1$$

$$\frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2$$

- Q3) a) Discuss the continuity of the function

$$f(x) = \begin{cases} \frac{3}{2} - 2x, & 0 < x < \frac{1}{2} \\ \frac{1}{2}, & x = \frac{1}{2} \\ x, & \frac{1}{2} < x < 1 \end{cases} \quad \text{at } x = \frac{1}{2}$$

- b) Sum the series $5 + 55 + 555 + 5555 + \dots$ to ' n ' terms.

- Q4) a) In how many ways can 5 girls and 5 boys can be seated at a round table, so that no two girls sit together?

- b) Find the absolute term in the expansion of $\left[\frac{3}{2}x^2 - \frac{1}{3x} \right]^6$.

- Q5) a) Prove the logical expression
($p \leftrightarrow q$) $\leftrightarrow$ ($r = p \leftrightarrow q$)

- b) If $y = \log_{10}(x + \sqrt{x^2 + 4})$, Prove that $\frac{dy}{dx} = \frac{\log_{10} e}{\sqrt{x^2 + 4}}$

- Q6) a) If $x = \log t$, $y = \frac{1}{t}$, $t > 0$ show that $\frac{d^2y}{dx^2} + \frac{dy}{dx} = 0$.

- b) Define a set. State and Prove De Morgan's Laws

- Q7) a) If $y = f(x) = \frac{7x-5}{4x-7}$, then prove that $f(y) = x$.

- b) If $x^y = e^{x-y}$, Prove that $\frac{dy}{dx} = \frac{\log x}{(1 + \log x)^2}$.



R-492

2

Roll No.

Total No. of Questions : 07]

[Total No. of Pages : 02

BBA (Sem. - 1st)
BUSINESS MATHEMATICS
SUBJECT CODE : BB - 102 (2008 - 2011 Batch)
Paper ID : [C0202]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.

Section - A

(10 × 2 = 20)

Q1)

- a) If Seven times the 7th term of an A.P. is equal to eleven times the 11th term, show that 18th term is zero.

- b) Which term of the series $1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \dots$ is $-\frac{1}{128}$?

- c) What sum of money amounts to ₹. 9261 at the rate of 5% per annum (compound interest) for 3 years hence?

- d) Prove that $\log a + \log a^2 + \log a^3 + \dots + \log a^n = \frac{n(n+1)}{2} \log a$.

- e) Find 'n' if the coefficients of the 4th and 13th terms in the expansion of $(a + b)^n$ are equal.

- f) Find the domain of the function $f(x) = \sqrt{-(x-1)(x-2)}$.

- g) Evaluate the limit $\lim_{x \rightarrow 0} \frac{2}{(1-5x)^x}$.

- h) Prove that $\frac{d}{dx}(e^{2 \log x}) = 2x$, $x > 0$.

- i) Find the value/s of 'x' for which the function $|2x-3|$ is maximum / minimum.

- j) Find the values of 'm' for which the equation $x^2 - 2mx + (8m - 15) = 0$ has equal roots.

Section - B

(4 × 10 = 40)

- Q2) a) Using Gauss elimination method, solve the following system of equations.

$$6x + y - 3z = 5$$

$$x + 3y - 2z = 5$$

$$2x + y + 4z = 8$$

R-492

P.T.O.