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Total No. of Questions : 07] [Total No. of Pages : 02

Paper ID [BB102]

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BBA (Sem. - 1st)

BUSINESS MATHEMATICS (BB - 102)

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

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

Section - A

Q1) *(10 × 2 = 20)*

a) For any two sets A and B show that, $A \cap B \subseteq A \subseteq A \cup B$

b) Construct the truth table for $\sim p \vee \sim q$

c) If ${}^{8}C_{r} - {}^{7}C_{3} = {}^{7}C_{2}$, find r.

d) Using Binomial theorem, evaluate $(99)^5$.

e) If a,b,c are in AP show that $b+c$, $c+a$, $a+b$ are also in A.P.

f) A function is defined as, $f(x) = \dfrac{x^2 - 4x + 3}{x^2 - 1}$ for $x \neq 1$

$= 2$ for $x = 1$

Test its continuity at $x=1$.

g) Find the maximum value of $1-x^2$.

h) State Cramer's rule to solve simultaneous equations.

i) If the sum of the series 2,5,8,11,.....is 60100, then find n.

j) Which is greater ; $\log_2 3$ or $\log_{\frac{1}{2}} 5$.

Section - B

(4 × 10 = 40)

Q2) (a) For any two sets A and B, show that, $(A \cap B)^C = A^C \cup B^C$.

(b) For any logical statements p,q and r, show that, $p \vee (q \wedge r) = (p \vee q) \wedge (p \vee r)$.

Q3) (a) Solve $x^2 - \sqrt{2x^2 - 8x + 12} = 4x + 6$.

(b) How many different words can be formed out of the letters of the word ALLAHABAD? In how many of them the vowels occupy the even positions?

Q4) (a) Prove that the coefficient of x^n in the expansion of $(1+x)^{2n}$ is double the coefficient of x^n in the expansion of $(1+x)^{2n-1}$.

(b) Sum to n terms the series, .7 + .77 + .777 + ...

Q5) (a) If in an A.P. , the sum of p terms in equal to the sum of q terms, then prove that the sum of $p + q$ terms is zero.

(b) If $a \neq 0$ then evaluate $\underset{x \to a}{Lt} \dfrac{\sqrt{a+2x} - \sqrt{3x}}{\sqrt{3a+x} - 2\sqrt{x}}$.

Q6) (a) If $x^y = y^x$, prove that $\dfrac{dy}{dx} = \dfrac{y(x \log y - y)}{x(y \log x - x)}$.

(b) Divide 64 into two parts such that the sum of the cubes of two parts is minimum.

Q7) (a) Apply Gauss elimination method to solve the equations, $x+4y-z = -5$; $x+y-6z = -12$; $3x-y-z=4$.

(b) Find the value of, $(.235)^{\frac{1}{5}}\ (.005)^{\frac{1}{2}}\ (208.610)^{-\frac{1}{2}}$.