BRAINWARE UNIVERSITY

Course – BBA

Business Mathematics (BBA103/ BBAC103)

(Semester – 1)

Time allotted: 3 Hours **Full Marks: 70**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group –A

(Multiple Choice Type Question)

1. Choose the correct alternatives for the following: **10 x 1 = 10**

i) 2,4,6,8,10,12,… is

a) Geometric Progression b) Arithmetic Progression c) Geometric Series d) Arithmetic Series

ii)If α and β are the roots of the equation x^2 -px + q = 0 then find the value of αβ .

a) q b) 1 c) 0 d) p

iii) Sum and product of roots of equation x^2 - kx + k^2 = 0 are

a) K, k^2 b) K^2 , k c) -k, k^2 d) k, $-k^2$

iv) Unit matrix written in format of square matrix is also called as

a) identity matrix b) unidentified matrix c) direction matrix d) dimension matrix

v) If ${}^nP_2 = 30$ then n=?

a) 6 b) 4 c) 5 d) 720

vi) The Cartesian Product B x A is equal to the Cartesian product A x B. Is it True or False?

a) True b) False

vii) What is the value of AB if A = {1, 2} and B = {a, b}?

a) {(1, a), (1, b), (2, a), (b, b)} b) {(1, 1), (2, 2), (a, a), (b, b)}

c) {(1, a), (2, a), (1, b), (2, b)} d) {(1, 1), (a, a), (2, a), (1, b)}

viii) 5 persons can be seated at a round table in

a) 25 ways b) 24 ways c) 20 ways d) None of the above

ix) Common difference of sequence 5,8,11,14,… is

a) 3 b) -3 c) 0 d) 1

x) Which of the following is the derivative of $y = x^2 + 7$

a) $dy/dx = 2x + 7$ b) $dy/dx = 2x$ c) $dy/dx = 2x^2$ d) $dy/dx = x^3 + c$

Group - B

(Short Answer Type Questions)

Answer any three of the following **3 x 5 = 15**

2. Define union and intersection of a set using Venn diagram.

3. If α and β are the roots of the equation $px^2 + qx + r = 0$ then find the value of $(\alpha^3\beta + \alpha\beta^3)$

4. Find out the value of lim $(5x^2 + 4x + 3)$ (where x tends to 2).

5. If $A = \begin{pmatrix} 2 & -1 & 0 \\ 3 & -2 & 1 \\ -3 & 0 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} -1 & 0 & 3 \\ 2 & -3 & 0 \\ 3 & 2 & 2 \end{pmatrix}$

Then prove that $(A + B)^T = A^T + B^T$

Group - C

(Long Answer Type Questions)

Answer any three of the following **3 x 15 = 45**

6. a) ${}^{n+r}P_2 = 110$ & ${}^{n-r}P_2 = 20$ Then Find the value of n and r.

b) How many different teams containing 3 boys and 4 girls can be made from a BBA class of 20 boys and 10 girls.

c) In a cricket team of 14 players, there are 6 bowlers. How many different teams of 11 players can be formed taking at least 4 bowlers in the team? [5+3+7]

7. a) Sum the series 2+4+6+…… up to 40 terms.

b) The sum of three numbers in AP is 18 and their product is 192. Find the numbers.

c) The sum of the first 6 terms of a GP is nine times the sum of the first 3 terms. Find the common ratio. [5 + 5 + 5]

8. a) If $A = \begin{pmatrix} 2 & 3 & 4 \\ 1 & -1 & 3 \end{pmatrix}$ $B = \begin{pmatrix} 2 & 1 \\ 4 & 3 \end{pmatrix}$ find BA.

b) Solve the following set of equations by using Cramer's rule:

$4x - 3y - 5 = 0$

$-2x + y + 3 = 0$

c) If ${}^{n}p_5 = 20\ {}^{n}p_3$ then find the value of n. [5 + 5 + 5]

9. a) If α and β are thr two roots of $x^2 - 2x + 3 = 0$, then find the equation with roots α+2, β+2.

b) Find out the middle term of the series $(2x+3y)^4$.

c) If the roots of the equation $x^2 - px + q = 0$ differ by unity then prove that $p^2 = 4q + 1$.

[5+5+5]

10) a) If $f(x) = x^2 - x$, then prove that $f(h+1) = f(-h)$.

b) Evaluate $\lim \{(x^2 + 3x + 4)/(x + 1)\}$ (where x tends to 2).

c) Evaluate dy/dx if $y = 2x^2 + 3x + 5$. [5+5+5]