

SARDAR PATEL UNIVERSITY
BBA (I Semester) Examination
Friday, 15th June 2012
11 am - 1 pm
UM01CBBA07 - Business Mathematics

Total Marks : 60

Q.1

- (a) State the associative and distributive laws for three sets A, B and C (6)
 and verify them by taking.
 $A = \{1, 2, 5, 6, 8\}$, $B = \{2, 4, 6, 10, 11\}$, $C = \{1, 2, 3, 5, 6, 11, 12\}$
- (b) Prove that $\sqrt{2}$ is an irrational number. (5)
- (c) Express $-3 < x < 8$ in modules form. (4)

OR

Q.1 Express

- (a) 1. $0.0272727 \dots$ into a quotient form. (3)
 2. $0 \leq |x + 5| < 1$ in the form of interval. (3)
- (b) Define the terms with example : (4)
 1. Difference of two sets
 2. Subset
 3. Intersection and union of two sets.

- (c) State De-Morgan's laws and verify it for : (5)
 $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
 $A = \{1, 2, 5, 6, 8\}$, $B = \{2, 4, 6, 10\}$

Q.2

- (a) Solve the system of equations using inverse matrix. (6)
 $x - 2y + 3z = 4$
 $2x + y - 3z = 5$
 $-x + y - 2z = 3$

- (b) Solve the following equations using Cramer's rule. (4)
 $2(x-1) + 3(y+1) = 15$
 $2(y+3) - 2(x-2) = 6$

- (c) It $A = \begin{bmatrix} 1 & 2 & 2 \\ 1 & 2 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ then find $A^2 - A + I$. (5)

OR

Q.2

- (a) It $A = \begin{bmatrix} 3 & 7 \\ 2 & 5 \end{bmatrix}$ then find $A + A^T + A^{-1}$ (5)

- (b) Solve the equations by Cramer's rule. (5)
 $\begin{vmatrix} x+2 & 3 \\ y+1 & 5 \end{vmatrix} = 8$, $\begin{vmatrix} x-1 & y-1 \\ 1 & 6 \end{vmatrix} = 4$

- (c) Let $A = B+C$, where B is a symmetric matrix and C is a skew symmetric matrix. If

$$A = \begin{bmatrix} 2 & 4 & 6 \\ 8 & 10 & 12 \\ 14 & 16 & 18 \end{bmatrix} \text{ then find } B \text{ and } C. \quad (5)$$

Q.3

- (a) Prove that the two lines $3x+4y+2=0$ and $12x+16y-7=0$ are parallel to each other. Also find the equation of a line passing through the point $(3,2)$ and parallel to these two lines. (5)
- (b) Find 'a' if the distance between $A (-3, -2)$ and $B (a, 1)$ is $3\sqrt{10}$. (3)
- (c) Find the equation of a line passing through the point $(2,3)$ and making equal intercepts on the axes. Also find its slope. (5)
- (d) What is the slope and intercepts of the line $5y = -3$? (2)

OR

Q.3

- (a) Find the equation of a line passing through the point of intersection of the lines $x+2y-1=0$ and $2x+3y-4=0$ and it makes equal intercepts on both the axes. (5)
- (b) Find the equation of a line perpendicular to the line joining $(3,2)$ and $(4,0)$ and passing through $(5,7)$. (5)
- (c) Find the equation of a line whose intercepts on X-axis and Y-axis are -3 and -4 respectively. Also find its slope. (5)

Q.4 Evaluate :

$$1. \quad \lim_{x \rightarrow 3} \frac{\sqrt{x+5} - 2\sqrt{2}}{\sqrt{x-1} - \sqrt{2}} \quad (5)$$

$$2. \quad \lim_{n \rightarrow \infty} 4 \left[\frac{1^3 + 2^3 + \dots + n^3}{n^4} \right] \quad (5)$$

$$3. \quad \lim_{x \rightarrow -1} \frac{x^{24} - 1}{x^{21} + 1} \quad (5)$$

OR

Q.4

- (a) If $f(x) = x^2$ then evaluate (5)

$$\lim_{x \rightarrow 0} \frac{f(x+2) - f(x-2)}{x}$$

- (b) Evaluate :

$$1. \quad \lim_{x \rightarrow -2} \frac{x^3 + 6x^2 + 11x + 6}{5x^2 + 10x} \quad (5)$$

$$2. \quad \lim_{x \rightarrow 0} \frac{2^x - 3^x}{3^x - 5^x} \quad (5)$$

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