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SARDAR PATEL UNIVERSITY
B B A (I Semester) Examination
28 April 2015 (Tuesday)
2.30 - 4.30 pm
UM01CBBA07 – Business Mathematics I

Total Marks : 60

Notes: Figures to the right indicate full marks.

Q. 1
(A) Explain the following terms with examples. (06)
(i) Null set (ii) Subset (iii) Union of two sets
(B) If A = {1, 4}, B = {4, 5} and C = {5, 7} then verify that (06)
(i) $A \times (B \cap C) = (A \times B) \cap (A \times C)$
(ii) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
(C) Solve the following equation (03)
$|x - 1| = 0.4$

OR

Q. 1
(A) By Venn diagram show that $(A \cup B)' = A' \cap B'$. (06)
(B) Express 0.0282828... into quotient form. (03)
(C) Express $|2x - 5| \leq 7$ in the form of an interval. (03)
(D) If A = {2, 3}, B = {6, 7} then find (03)
(i) $A \cup B$ (ii) $A \cap B$ (iii) $A \times B$

Q. 2
(A) State the properties of 3×3 determinant. (05)
(B) Solve the following equations by Cramer's rule. (05)
$2x + 3y = 14$
$x - y = 2$
(C) Find the inverse of the following matrix. (05)

$$A = \begin{bmatrix} 2 & 1 & -1 \\ 1 & 0 & -1 \\ 1 & 1 & 2 \end{bmatrix}$$

OR

Q. 2
(A) Explain the following terms with examples. (04)
(i) Identity matrix (ii) Symmetric matrix
(B) If $A = \begin{bmatrix} 0 & 4 & 3 \\ 1 & -3 & -3 \\ -1 & 4 & 4 \end{bmatrix}$ Find A^2. (05)
(C) Using inverse matrix solve the following equations. (06)
$2x + 5y = 16$
$3x + y = 11$

Q. 3

(A) Obtain the equation of a line passing through (x_1, y_1) and having slope m. (05)

(B) Find the equation of a line passing through the points (3, –7) and (–4, 9). (05)

(C) A straight line makes intercepts 3 and –5 on X and Y axis respectively. Find its equation. (05)

OR

Q. 3

(A) Find the equation of a straight line parallel to the line $4x + 3y - 10 = 0$ and passing through the origin. (05)

(B) Find the equation of the straight line passing through the point (4, 5) and the sum of its intercepts on the axis is 18. (05)

(C) Find the equation of a line passing through (5, 7) and perpendicular to the line $2x + 3y + 5 = 0$. (05)

Q. 4

(A) State the rules of limit. (03)

(B) Evaluate (12)

(i) $\lim_{x \to 3} \frac{x+7}{x-2}$

(ii) $\lim_{x \to 4} \frac{x^2-16}{x-4}$

(iii) $\lim_{x \to 3} \frac{\sqrt{x+2}-\sqrt{5}}{(x-3)}$

(iv) $\lim_{x \to 0} \frac{a^x-b^x}{x}$

OR

Q. 4

(A) Evaluate (15)

(i) $\lim_{x \to a} \frac{x^{15}-a^{15}}{x^7-a^7}$

(ii) If $f(x) = x^2$, find $\lim_{x \to 0} \frac{f(x+2)-f(x-2)}{x}$

(iii) $\lim_{x \to 1} \left[\frac{1}{(x-1)} - \frac{2}{\left(x^2-1\right)}\right]$