SARDAR PATEL UNIVERSITY
B.B.A (GEN.) (I SEM.) EXAMINATION
2013
Saturday, 5th January
10.30 am to 12.30 pm
UM01CBBA05/10 : BUSINESS MATHEMATICS - I

Total Marks: 60

Note: Figures to the right indicate marks.

Q.1
(a) Using Venn diagram show that   [04]
     $(A \cup B)' = A' \cap B'$
(b) Express -7 < x < 8 in modulus form.   [03]
(c) Express $|2x - 5| \leq 7$ in the form of an interval.   [03]
(d) If $A = \{1, 2\}, B = \{2, 3\}, C = \{3, 5\}$ then show that   [05]
     A x (B $\cup$ C) = (A x B) $\cup$ (A x C).

OR

Q.1
(a) State associative laws for three sets and verify them for the following   [06]
     sets. $A = \{1, 2, 3\}, B = \{2, 3, 7\}, C = \{1, 3, 7, 8\}$.
(b) Explain the following terms.   [04]
     (i)   Universal set   (ii)   Finite set.
(c) Express 0.0272727..... into a quotient form.   [03]
(d) Find the power set $A = \{0, u\}$,   [02]

Q.2
(a)   [04]
     If $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \\ -1 & -2 & -3 \end{bmatrix}$ then find A^2.
(b) Using inverse matrix solve the following equations.   [06]
     $2x + 5y = 16$
     $3x + y = 11$
(c) Show that   [05]
     $\begin{vmatrix} a+x & a-x & a-x \\ a-x & a+x & a-x \\ a-x & a-x & a+x \end{vmatrix} = 4x^2(3a - x)$

OR

Q.2
(a) Explain the following terms.   [04]
     (i)   Square matrix   (ii)   Skew-symmetric matrix
(b) Solve the following equations by Cramer's rule   [06]
     $3x - 2y = 5$
     $5x + 4y = 1$
(c) Find the inverse of the following matrix.   [05]
     $A = \begin{bmatrix} 2 & 1 & -1 \\ 1 & 0 & -1 \\ 1 & 1 & 2 \end{bmatrix}$

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Q.3
(a) Show that the equation of line passing through (x_1, y_1) with slope m [05] is $y - y_1 = m (x - x_1)$

(b) Find the equation of a line which passes through the point of [05] intersection of $5x + y + 4 = 0$ and $2x + 3y - 1 = 0$ and is perpendicular to $2x - y - 9 = 0$

(c) Find the equation of a line having slope $\frac{2}{3}$ and the intercept on Y-axis [05] as 6.

OR

Q.3
(a) Find the equation of a line perpendicular to the line joining the points [05] (3, 2) and (4, 0) and passing through (5, 7).

(b) Find the equation of a line passing through the point (2, 3) and [05] making equal intercepts on the axes. Also find its slope.

(c) The equation of a line is $4x + 7y + 9 = 0$ find its slope and intercept [05] on Y-axis.

Q.4
(a) Evaluate the following. [12]

(i) $\lim\limits_{x \to 1} \left[\frac{1}{x-1} - \frac{2}{x^2-1}\right]$

(ii) $\lim\limits_{x \to a} \frac{x^{16}-a^{16}}{x^8-a^8}$

(iii) $\lim\limits_{x \to 0} \frac{a^x-b^x}{x}$

(b) State the working rules of limit. [03]

OR

Q.4
Evaluate the following. [15]

(i) $\lim\limits_{x \to 1} \frac{\sqrt{x+2}-\sqrt{3}}{(x-1)}$

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

(iii) $\lim\limits_{x \to 0} \frac{2(5^x)+3(2^x)-5}{x}$

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