

**SARDAR PATEL UNIVERSITY**  
**F Y BBA (ISM) (I Sem.) Examination**  
**Thursday, 6<sup>th</sup> December 2012**  
**10.30 am - 12.30 pm**  
**UM01CBBS07 - Business Mathematics**

**Total Marks: 60**

**Note:** Figures to the right indicate marks.

Q.1

- (a) Express  $|x - 4| < 7$  in the form of an interval. [04]
- (b) State De Morgan's laws for two sets A and B and verify it for the following sets. [06]  
 $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ ,  $A = \{1, 3, 5, 7\}$  and  $B = \{2, 4, 6, 8\}$
- (c) If  $A = \{1, 3, 4, 6\}$  and  $B = \{2, 3, 6, 7\}$  then find [05]  
 (i)  $A \times B$       (ii)  $A \cup B$       (iii)  $A \cap B$       (iv)  $A - B$       (v)  $B \times A$

**OR**

Q.1

- (a) Write the properties of absolute value. [04]
- (b) If  $A = \{0, 1, 2, 3, 4\}$ ,  $B = \{2\}$  and  $C = \{3\}$  then show that [06]  
 $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ .
- (c) Express  $-7 < x < 8$  in a modulus form. [03]
- (d) Solve the following equation. [02]  
 $|x - 1| = 0.1$

Q.2

- (a) State the properties of 3 x 3 determinants. [05]
- (b) Solve the following equations using Cramer's rule. [05]  
 $\frac{4}{x} + \frac{3}{y} = 6$        $\frac{5}{x} + \frac{2}{y} = 5$
- (c) If  $A = \begin{bmatrix} 0 & 4 & 3 \\ 1 & -3 & -3 \\ -1 & 4 & 4 \end{bmatrix}$  then find  $A^2$ . [05]

**OR**

Q.2

- (a) Explain the following terms with examples. [04]  
 (i) Skew-symmetric matrix  
 (ii) Identity matrix
- (b) Show that [05]  

$$\begin{vmatrix} ax + a & bx & a - bx \\ bx + b & cy & b - cy \\ cx + c & az & c - az \end{vmatrix} = 0$$

- (c) Obtain the inverse of following matrix. [06]

$$A = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 3 \\ 3 & 2 & 1 \end{bmatrix}$$

Q.3

- (a) Obtain the equation of a line having slope  $m$  and passing through  $(x_1, y_1)$ . [05]  
(b) Find the slope of line joining the points  $(1, 0)$  and  $(2, -1)$ . Does the point  $(2, 2)$  lie on this line? [05]  
(c) A line passes through the point of intersection of the lines  $5x + 2y - 11 = 0$  and  $3x - y + 11 = 0$  and it is perpendicular to  $4x - 3y + 2 = 0$ . Find its equation. [05]

**OR**

Q.3

- (a) Find the equation of a line perpendicular to the line joining  $(3, 2)$  and  $(4, 0)$  and passing through  $(5, 7)$ . [05]  
(b) Obtain the equation of the straight line passing through the point of intersection of the lines  $y = 2x + 1$  and  $y = x + 2$  and parallel to the line  $y = 4x + 7$ . [05]  
(c) If the lines  $ax + by + 1 = 0$  and  $x + y + 1 = 0$  are perpendicular and their point of intersection is  $(1, -2)$  then find the values of "a" and "b". [05]

Q.4

- (a) State the rules of limits. [04]  
(b) Evaluate  $\lim_{x \rightarrow 1} \frac{\sqrt{x+2} - \sqrt{3}}{(x-1)}$  [06]  
(c) If  $f(x) = x^2 + 5$  then find  $\lim_{h \rightarrow 0} \frac{f(3+h) - f(3)}{h}$  [05]

**OR**

Q.4

- (a) Evaluate  $\lim_{x \rightarrow 2} \left[ \frac{1}{(x-2)} - \frac{2}{(x^2 - 2x)} \right]$  [05]  
(b) Evaluate  $\lim_{x \rightarrow 0} \frac{a^x - b^x}{x}$  [05]  
(c) Evaluate  $\lim_{x \rightarrow 2} \frac{x^4 - 16}{(x-2)}$  [05]

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