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No. of printed pages: 02

SEAT No._____

[58/A-21]

SARDAR PATEL UNIVERSITY
B.B.A. (General) EXAMINATION
SEMESTER – I
Wednesday, 15th November 2017
2.00 p.m. to 4.00 p.m.
BUSINESS MATHEMATICS-I (UM01CBBA07)

Total Marks: - 60

Note: Figures to the right indicate marks.

Q.1

(a) Define following terms: 04
    1. Intersection of two sets   2. Power set

(b) If $A = \{1,2,5,6,8\}$, B $= \{x: x \text{ is even}, x \le 10, x \in N\}$ and $C = \{1,2,3,5,6,11,12\}$. 05
Then verify
    1. $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
    2. $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

(c) i) Find power set of set $A = \{p, q, r\}$. 06
ii) Express 0.32323232….into quotient form.

Q.1   **OR**

(a) If $U = \{x: x \le 10, x\epsilon N\}$, $A = \{2,4,3,1\}$, $B = \{5,4,6,7\}$ & $C = \{9,4,5,8\}$ then 04
verify that
    1. $A \cap (B - C) = (A \cap B) - (A \cap C)$
    2. Find $A \Delta B$.

(b) Verify following by Venn Diagram: 05
    1. $(A \cup B)' = A' \cap B'$
    2. $(A \cap B)' = A' \cup B'$

(c) i) Solve: $|x - 5| = 3$ 06
ii) Express the following inequalities in a Modulus form: $5 < x < 9$

Q.2

(a) Show that $A = \frac{1}{9}\begin{bmatrix} 1 & 8 & -4 \\ 4 & -4 & -7 \\ 8 & 1 & 4 \end{bmatrix}$ is orthogonal matrix 04

(b) If $A = \begin{bmatrix} 1 & 0 & 2 \\ 2 & 4 & 1 \\ 3 & 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 & 0 \\ 2 & 0 & 1 \\ 1 & 3 & 2 \end{bmatrix}$, then find AB and BA. 05

(c) Solve the following equations by Inverse of matrix: 06
    $2x + 3y = 10$,
    $x + 6y = 4$

Q.2   **OR**

(a) Explain following terms with example: 04
    1. Null Matrix
    2. Transpose matrix

(b) Solve the following equations by Cramer's rule: 05
$5x + 3y = 5$,
$7x + 2y = -4$

(c)
If $A = \begin{bmatrix} 1 & 3 & 4 \\ 3 & -1 & 2 \\ 2 & 3 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 & 0 \\ 2 & 3 & 1 \\ 4 & 2 & 3 \end{bmatrix}$ and $C = \begin{bmatrix} 0 & 1 & 4 \\ 2 & 0 & 3 \\ 1 & 3 & 2 \end{bmatrix}$ 06

Then find   **1.** $A + C$ **2.** $A + B + C$ **3.** $A - B + 2C$

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

(b) Find the equation of a line having X – intercept is -3 and Y – intercept is 6.   05

(c) (i) Show that the points $(-2, 3)$, $(5, 8)$ and $(-9, -2)$ are collinear.   05
(ii) Find the slope of the line $4x - 3y = 12$. Also find the intercepts on the axes.

Q.3   **OR**

(a) Show that the equation of a line having slope m and Y- intercept c is $y = mx + c$.   05

(b) Find k if the distance between $P(k, -4)$ and $R(-8, 2)$ is 10.   05

(c) Find the equation of a line passing through the point $(-3, 7)$ and making equal   05
intercepts on the co-ordinate axes.

Q.4
(a) Write working rules for limit.   05

(b) Evaluate following: 10
   1. $\lim\limits_{x \to 3} \dfrac{x^3 - 27}{x^2 - 9}$

   2. $\lim\limits_{x \to 0} \dfrac{a^x - b^x}{x}$

Q.4   **OR**

(a) If $f(x) = x^2$, then evaluate $\lim\limits_{x \to 0} \dfrac{f(x+1) - f(x-1)}{x}$ 05

(b) Evaluate following:
   1. $\lim\limits_{x \to 3} \dfrac{x^2 + 5x + 6}{x - 2}$ 05

   2. $\lim\limits_{x \to 0} \dfrac{\sqrt{x+1} - 1}{x}$ 05

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