

(1) Seat No: _____

NO. Of printed pages: 02

SARDAR PATEL UNIVERSITY
B.B.A. (General) EXAMINATION
SEMESTER - I (NC)

Saturday, 18th March, 2017

BUSINESS MATHEMATICS-I (UM01CBBA07)

Time: - 2.00 p.m. to 4.00 p.m.

Total Marks: - 60

Note: Figures to the right indicate marks.

Q.1

- (a) If A = set of the letters of the word 'WHAT', B = set of the letters of the word 'HEAT' and C = set of the letters of the word 'EATA' 04
 Then find $B \times (A - B)$ and $C \times C$.
- (b) State and Prove De Morgan laws by taking 05
 $U = \{i, j, k, l, m, n, o, p\}$, $A = \{j, k, m, o\}$ and $B = \{k, n, p, i\}$
- (c) i) Express the following inequalities in a Modulus form: $-4 < x < 3$ 06
 ii) Find power set of set $A = \{1, 2, 3\}$.

Q.1**OR**

- (a) Define following terms: 04
 1. Empty set
 2. Power set
 3. Intersection of two sets
 4. Difference of two sets
- (b) State and verify Distributive Laws by Venn Diagram. 05
- (c) i) Express in the form of an interval: $|x - 5| < 3$ 06
 ii) Express 0.21212121....into quotient form.

Q.2

- (a) Explain following terms with example: 04
 1. Diagonal Matrix
 2. Transpose matrix
- (b) If $A = \begin{bmatrix} 1 & 1 & 3 \\ 2 & 3 & 1 \\ 3 & 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 1 & 2 \\ 2 & 4 & 1 \\ 1 & 2 & 2 \end{bmatrix}$, then find AB and BA . 05
 Also check whether $AB = BA$ or not.
- (c) Solve using inverse of a matrix: 06

$$\begin{aligned} x - 2y + 3z &= 4 \\ 2x + y - 3z &= 5 \\ -x + y + 2z &= 3 \end{aligned}$$

Q.2**OR**

- (a) Solve the following equations by Cramer's rule: 05
 $2x + 3y = 11$,
 $x - 5y = -14$
- (b) If $A = \begin{bmatrix} 4 & -1 \\ -1 & 3 \\ 2 & 0 \end{bmatrix}$, $B = \begin{bmatrix} -2 & 5 \\ 3 & -1 \\ 5 & 2 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & 4 \\ -1 & -5 \\ 3 & -2 \end{bmatrix}$, 05
 Then find 1. $A + C$ 2. $A + B + C$ 3. $2A - 3B + C$
- (c) If $A = \begin{bmatrix} 5 & 4 \\ 3 & 2 \end{bmatrix}$ Then find $A^2 - 3A + 14I$. 05

Q.3

- (a) Show that the equation of a line having slope m and Y -intercept c is $y = mx + c$. 05
- (b) Given $A(2,4)$, $B(6,8)$ and $C(a+4, 2a+6)$ and $\overline{AC} \perp \overline{AB}$, Find a . 05
- (c) Find the equation of a line whose slope is 3 and which passes through the intersection of the lines $x-4y+18=0$ and $x+y-12=0$. 05

Q.3

OR

- (a) Find the equation of line passing through the points $(1, 2)$ and $(2, 1)$. Also find its slope and intercepts on the axes. 05
- (b) Find a if the distance between $A(a, -4)$ and $B(-8, 2)$ is 10. 05
- (c) Find the value of k if the following points are collinear: 05
 $A(4,5)$, $B(8,8)$ and $C(12,k)$.

Q.4

- (a) Write working rules for limit. 03
- (b) Evaluate following: 12

$$1. \lim_{x \rightarrow 5} \frac{x^3 - 125}{x^2 - 25}$$

$$2. \lim_{n \rightarrow \infty} \left(1 + \frac{3}{n}\right)^n$$

$$3. \lim_{x \rightarrow 3} \frac{\sqrt{x+2} - \sqrt{5}}{x-3}$$

$$4. \lim_{x \rightarrow 3} \frac{x^3 - 27}{x^2 - 5x + 6}$$

OR

Q.4 Evaluate following:

$$1. \lim_{x \rightarrow -1} \frac{x^2 + 4x + 4}{x + 2} \quad 03$$

$$2. \lim_{x \rightarrow 0} \frac{5^x - 3^x}{x} \quad 04$$

$$3. \lim_{x \rightarrow 2} \frac{x^3 - 3x^2 + 3x - 2}{x - 2} \quad 04$$

$$4. \lim_{x \rightarrow 0} \frac{1}{x} \left(\frac{3x+10}{5x+2} - 5 \right) \quad 04$$

— X —