

SARDAR PATEL UNIVERSITY
BBA (ISM) (I Semester) Examination
Friday, 15 June 2012
11am - 1 pm

UB01CBBI07 - Business Mathematics

Total Marks : 60

Q.1

- (a) Define the following terms :
 (1) Subset (2) Null set (3) Complement of a set [05]
 (4) Universal set (5) Singleton set.
- (b) If $A=\{5,6,7\}$, $B=\{7,8\}$ and $C=\{5,8\}$ then verify the following. [05]
 (1) $A \times (B - C) = (A \times B) - (A \times C)$
 (2) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
- (c) Prove that $\sqrt{2}$ is an irrational number. [05]

OR

Q.1

- (a) Express (1) 0.1666 into a quotient form. [03]
 (2) $0 \leq |x-3| < 2$ in the form of an interval. [02]
- (b) State and prove De 'Morgan's laws by taking proper example. [05]
- (c) Define the terms with example. [05]
 (1) Difference of two sets.
 (2) Intersection of two sets.
 (3) Union of two sets.

Q.2

- (a) If $A = \begin{bmatrix} 4 & -1 \\ -1 & 3 \\ 2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 5 \\ 3 & -1 \\ 5 & 2 \end{bmatrix}$ [05]

and $C = \begin{bmatrix} 2 & 4 \\ -1 & -5 \\ 3 & -2 \end{bmatrix}$ then find (1) $A+B$ (2) $A+B+C$ (3) $3A-2B+2C$

- (b) If $A = \begin{bmatrix} 3 & 2 \\ 5 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 2 \\ 2 & 1 \end{bmatrix}$ then find (1) $AB+B^{-1}A^{-1}$ [06]

- (c) Solve the following equations using Cramer's rule [04]
 $2(x-1) + 3(y+1) = 15$
 $2(y+3) - 2(x-2) = 6$

OR

Q.2

(a) Write the properties of determinant. [05]

(b) [05]

If $A = \frac{1}{3} \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ -2 & 2 & -1 \end{bmatrix}$ then check whether A is orthogonal or not. Also

define symmetric matrix with example.

(c) Solve the following equations using inverse of a matrix. [05]

$$2x + y = 4, \quad 5x + 3y = 9$$

Q.3

(a) Find the equation of a line passing through the points (-1,2) and (5,-3). Also find its slope and intercepts on the axes. [05]

(b) Find the equation of the line passing through a point A (x_1, y_1) and having slope m. [05]

(c) Find x if $d\{(x_1, 4), (-8, 2)\} = 10$ [05]

OR

Q.3

(a) Find the equation of a line passing through the points of intersection of the lines $x+2y-1=0$ and $2x+3y-4=0$ and making equal intercepts on both the axes. [05]

(b) Find the equation of a line making intercepts a and b on X-axis and Y-axis respectively. [05]

(c) Find the equation of a line passing through the point of intersection of the lines $x-4y+18=0$ and $x+y-12=0$ whose slope is 2.. [05]

Q.4

(a) Write the rules for limit. [05]

(b) Evaluate

1. $\lim_{x \rightarrow 0} \frac{2^{5x} - 5^{2x}}{3^{2x} - 2^{3x}}$ [05]

2. $\lim_{n \rightarrow \infty} \frac{1^2 + 2^2 + \dots + n^2}{2n^3}$ [05]

OR

Q.4

(a) If $f(x) = \frac{1}{x}$ then find $\lim_{x \rightarrow 3} [f(\frac{1}{x}) + f(-x)]$ [05]

(b) Evaluate [05]

$$\lim_{x \rightarrow 2} \frac{\sqrt{x^2 + x - 3} - \sqrt{x + 1}}{x - 2}$$

(c) 1. $\lim_{x \rightarrow 3} \frac{x^3 - 27}{x^2 - 9}$ [02]

2. $\lim_{n \rightarrow \infty} \left(\frac{n+3}{n}\right)^n$ [03]

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