[02] No. of printed pages: 02

SARDAR PATEL UNIVERSITY
FY BBA (ITM) (I Sem.) Examination
Thursday, 6th December 2012
10.30 am - 12.30 pm
UM01CBBI07 - Business Mathematics

Total Marks: 60

Note: Figures to the right indicate marks.

Q.1
(a) State and prove De'morgan laws by taking proper Example. [05]
(b) Express, [06]
(1) $o \leq |x + 3| < 2$ in the form of an interval.
(2) $-7 < x < 8$ in a modulus form.
(c) If A= {5, 6, 7, 8} and B= {7, 8, 9, 10} & C = {10, 11, 18} [04]
then find (A-B) U (B-C)

OR

Q.1
(a) If A= {1, 3} and B= {5, 6} and C = {6, 9} [06]
then prove that
(1) A x (B$\cap$C) = (A x B) $\cap$ (A x C)
(2) A x (B$\cup$C) = (A x B) $\cup$ (A x C)
(b) Define the terms. [03]
Subset, Difference of two sets and Complement of a set
(c) Solve for x [06]
(1) $|x-1| = 0.1$ (2) $|x-1| = 1$

Q.2
(a) Solve the following by Cramer's rule [05]
2(x-1) + 3(y+1) = 15
2(y-3) - 2(x-2) = 6
(b) If $A=\begin{bmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \\ -1 & -2 & -3 \end{bmatrix}$ then prove that $A^2 = O$. [04]
(c) If $A=\begin{bmatrix} 3 & 2 \\ 5 & 3 \end{bmatrix}$ and $B=\begin{bmatrix} 3 & 2 \\ 2 & 1 \end{bmatrix}$ then find $AB + B^{-1}A^{-1}$. [06]

OR

Q.2
(a) Write the rules for Determinant. [05]
(b) Solve the following system of equations using inverse of a matrix. [06]
x + y + z = 3
x + 2y + 3z = 6
3x + y + 2z = 6
(c) Prove that $A = \begin{bmatrix} \frac{1}{2} & \frac{-\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}$ is an orthogonal natrix. [04]

Q.3

(a) If A(-3, 2), B(1, -2) and C(5, 6) are vertices of Δ ABC, then find the area of Δ ABC. [04]

(b) Find the equation of a line passing through the point of intersection of the lines x-2y+3=0 and 2x-3y+4=0 and parallel to the line joining the points (2, 3) and (-4, 0). [06]

(c) Find k if the points (2, $^{3}/_{2}$), (-3, $^{-7}/_{2}$) and (K, $^{9}/_{2}$) are collinear. [05]

OR

Q.3

(a) Obtain the equation of a line joining two points A(x_1, y_1) and B(x_2, y_2) [05]

(b) Find the equation of the line passing through the intersection of x-2y + 5 = 0 and 3x+y-4 = 0 and parallel to y=2x+3. [05]

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

Q.4

(a) Evaluate [04]

$$\lim_{n \to \infty} \left(\frac{n+3}{n} \right)^{n}$$ [04]

(b) Evaluate [06]

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

(c) Evaluate : [05]

$$\lim_{x \to 0} \frac{13^{x}-7^{x}}{3x}$$

OR

Q.4

(a) Evaluate : [05]

$$\lim_{x \to -1} \left\{ 1+\frac{1}{1+\frac{1}{1+\frac{1}{x}}} \right\}$$

(b) Evaluate : [05]

$$\lim_{x \to 2} \frac{x^3-3x^2+3x-2}{2x^3-5x^2-x+6}$$

(c) if $f(x)=x^2$ then find [05]

$$\lim_{x \to 0} \frac{f(x+2)-f(x-2)}{x}$$

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