SEAT No._____

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[113]

# SARDAR PATEL UNIVERSITY

## OCTOBER - NOVEMBER: 2018 EXAMINATION, BBA (ITM) SEMESTER : I

## SATURDAY, 27/10/2018

## EVENING SESSON TIME : 2.00 PM. TO 4.00 P.M.

## SUBJECT CODE : UM01DBBI22

## BUSINESS MATHEMATICS

**TOTAL MARKS : 60**

Q-1 (A) If A = {-3, -2, 2, 0}, B = {3, 2, -2, 0} then find [05]

(1) AUB (2) A∩B (3) A-B (4) B – A (5) (A∩B) U A

Q-1 (B) Define the following terms : [05]

(1) Null Matrix (2) Square matrix

(3) Unit matrix (4) Union and intersection of two sets

Q-1 (C) If $A = \begin{bmatrix} 1 & -2 & 3 \\ 2 & 3 & -1 \\ -3 & 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 2 \\ 1 & 2 & 0 \end{bmatrix}$ then find AB and BA. [05]

OR

Q-1 (A) If [05]

A = Set of letters of the word "HUMAN"

B = Set of letters of the word "WOMAN"

C = Set of letters of the word "MAN"

then verify

(1) A∩(BUC) = (A∩B) U (A∩C)

(2) AU(B∩C) = (AUB) ∩(AUC)

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

(1) 2A + C (2) A - 2B + 3C (3) A + B + C

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

(1) $(AB)^T = B^TA^T$ (2) $(A+B)^T = A^T+B^T$

Q-2 (A) Find the value of n, if ${}_nC_4 : {}_nC_3 = 7:4$. [05]

Q-2 (B) How many new words can be formed using all the letters of the word "SEJAL" out of these how many words will [05]

(1) Start from 'S'?

(2) Start from vowel and end with 'J'?

Q-2 (C) Find the number of committees of 5 members from 7 boys and 4 girls that can be formed so that each committee contains at least one girl? [05]

OR

Q-2 (A) Find n is [05]

(1) ${}_nP_4 = 840$ and Evaluate ${}_{50}C_{48}$

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Q-2 (B) How many three digited numbers can be formed using the digits 7, 5, 1, 2, 4, 6, 8 only one time. How many of them are [05]

(1) Odd numbers?

(2) More than 500 ?

(3) Less than 700?

Q-2 (C) Find the number of committees of 6 members from 6 boys and 3 girls that can be formed so that each committee contains at least three boys. [05]

Q-3 (A) If $f(x) = x^3 - 3x + 4$ then find at which point the function is maximum and at which point it is minimum? [05]

Q-3 (B) Write the rules of differentiation. [05]

Q-3 (C) Find dy/dx [05]

(1) $y = 3^x \cdot e^x$

(2) $y = x^5 + 3x^2 + \log x - \frac{1}{x}$

OR

Q-3 (A) Find Elasticity of supply if supply function $x = 5 + 2P^2$ when $P = 2$. [05]

Q-3 (B) Find dy/dx for [05]

(1) $y = \frac{2x^2 - 4x}{x^2 - 3}$

(2) $y = e^x \cdot \log x \cdot 5^x$

Q-3 (C) If cost function $c(x) = 500 + \frac{1}{2}x^2$ and Revenue function $R(x) = 200x$ then find the units x for the maximum profit. [05]

Q-4 (A) Rs. 1500 is invested at 6% per annum by simple interest by Mr. X and the same amount for 6% compound interest is invested by Mr. Y then after 3 years who will get more interest ? How much? [05]

Q-4 (B) Cost of building a new house is Rs. 4,70,000 at present. If it increases at 8%. Find out the increased cost of a similar house if it is built after 3 years. [05]

Q-4 (C) The population of a city at present is 49949. Which was 35498 before 7 years. Find out the rate of growth of population. [05]

OR

Q-4 (A) Define the terms with appropriate formula for following. [05]

(1) Simple interest

(2) Sinking Fund

(3) Annuity

Q-4 (B) A company purchases a machine for Rs. 2,00,000 with the expected life of 12 years. When a new machine will have to be purchased, it would cost double the price as previous. In order to purchase a new machine what amount should be invested on 31st December every year for 12 years at 15% of interest? [05]

Q-4 (C) If the rate of interest is 12% what sum should Shreya deposit in her recurring account in bank in the beginning of every year, so that her 5 year old son can receive 1,50,000 when he is 25 years old? [05]

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