(5) Seat No.:_____ No. of Printed Pages : 3

SARDAR PATEL UNIVERSITY

MARCH : 2017 EXAMINATION, BBA (ITM) SEMESTER : I (NC)

SATURDAY, 18/03/2017

MORNING SESSON TIME : 2.00 TO 4.00 PM

SUBJECT CODE : UM01EBBI03

BUSINESS MATHEMATICS

TOTAL MARKS : 60

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

(1) Subset (2) Complement of a set (3) Square matrix

(4) Transpose of a matrix (5) Identity matrix

Q-1 (B) Verify De'Morgan laws for U = {a, b, c, d, e, f, g, h, i}, A = { a, b, c, e, f}, B = {e, d, f, g} [05]

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

OR

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

Q-1 (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 $C = \begin{bmatrix} 2 & 4 \\ -1 & -5 \\ 3 & -2 \end{bmatrix}$ then find [05]

(1) A+B (2) A+B+C (3) 3A-4B+2C

Q-1 (C) Draw the Venn diagram for (1) Subset (2) Union (3) Intersection (4) Complement of a Set [05]

Q-2 (A) Evaluate : [05]

(1) ${}_{10}P_3 \times {}_6P_2$

(2) ${}_{50}C_{48}$

(3) ${}_{20}C_4 \div {}_{10}C_4$

Q-2 (B) Find n, if [05]

$16 \times {}_nP_3 = 13 \times {}_{(n+1)}P_3$

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

OR

(P.T.O.)

Q-2 (A) Find n and r if [15]

${}_nP_r = 360$ and ${}_nC_r = 15$

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

(1) Odd numbers

(2) Divisible by 5

(3) Less than 700

(4) More than 500?

Q-2 (C) A question paper contains 10 questions divided into two sections of 5 questions each. In how many ways a student can answer 6 questions taking at least 2 questions from each section? [05]

Q-3 (A) Find dy/dx for following. [09]

(1) $y = x + \frac{1}{x} + \log x + a^x$

(2) $y = x^7 \cdot e^x \cdot \log x$

(3) $y = \frac{\log x}{x}$

Q-3 (B) Find the maximum and minimum value of [06]

$$f(x) = \frac{2}{3}x^3 + \frac{1}{2}x^2 - 6x + 8$$

OR

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

Q-3 (B) A company has examined its cost and revenue structure. Total cost function C and total revenue function R for x units of production are as under. [05]

$$C(x) = 500 + \frac{1}{x}x^2, \qquad R(x) = 200x$$

Find the production units x that will maximize the profit of the company.

Q-3 (C) If the supply function $x=5+2P^2$ then find elasticity of supply when P = 2. [05]

Q-4 (A) Define the terms with appropriate formula for following. Sinking Fund, Simple interest, Compound interest, Annuity. [05]

Q-4 (B) The population of a city at present is 76,162, which was 65,673 before 5 years. Find out the rate of growth of population. [05]

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

OR

Q-4 (A) Priya has opened a recurring account for a period of 10 years. She deposits Rs. 2500 in this account in the beginning of every year if the rate of interest is 11%, find out the total amount in her account at the end of 10 years. [05]

Q-4 (B) Pinal borrows Rs. 32,000 at the rate 16% of simple interest and invests it on the same day at the rate 14% of compound interest. At the end of 4 years how much profit or loss will she have? [05]

Q-4 (C) A company purchases a machine on 1-1-2016 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]

All the Best