SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

NOVEMBER-DECEMBER : 2017 EXAMINATION, BBA (ITM) SEMESTER : I

[71]

WEDNESDAY, 15/11/2017

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

SUBJECT CODE : UM01EBBI03

BUSINESS MATHEMATICS

TOTAL MARKS : 60

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

(1) Union and intersection of two sets (2) Square matrix (3) Unit matrix (4) Null Set

Q-1 (B) State De'Morgan laws and verify it for U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10} A = {1, 2, 5, 6, 8}, B={2, 4, 6, 10}. [05]

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

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

OR

Q-1 (A) If A = {1, 2, 3, 4}, B = {2, 4, 6, 8} and C = {3, 4, 5, 6} then verify that [05]

(1) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

(2) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

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

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

Q-1 (C) State and prove De'Morgan laws by diagram. [05]

Q-2 (A) Evaluate : [05]

(1) ${}_{10}C_3 \times {}_5C_2$

(2) ${}_7P_3 \times {}_5P_2$

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

${}_{2n}P_3 = 14 . {}_nP_4$

Q-2 (C) How many different numbers of six digits can be formed using the digits 2, 1, 4, 5, 7, 8 ? How many of them will be divisible by 5. [05]

OR

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

${}_{n+1}C_6 : {}_nC_5 = 11:6$

Q-2 (B) A Committee of six is to be formed from 6 boys and 3 girls, in how many ways this can be done so that the committee contains at least 3 boys. [05]

Q-2 (C) Evaluate : [05]

(1) ${}_{10}C_3$

(2) ${}_4C_1 + {}_4P_2$

(3) ${}_5C_2 \times {}_5P_2$

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

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

(1) $y = x^4 \times e^x$

(2) $y = \dfrac{3^x}{\log x}$

Q-3 (C) The demand function of a commodity is $P = 50 - \dfrac{5}{2}x$, determine demand and price for maximum revenue. [05]

OR

Q-3 (A) Find dy/dx for

(1) $y = 4x^3 + 4e^x + \log x + \dfrac{1}{x} + 7^x$ [05]

(2) $y = \dfrac{2x+3}{3x+1}$ [05]

Q-3 (B) Find the maximum and minimum values of the function. [05]

$y = x^3 - 3x^2 - 9x + 5$

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

Q-4 (B) What is an aggregate amount for Rs. 4,000 at 12% rate of compound interest for 3 years if the interest is compounded (1) Annually (2) Semi Annually. [05]

Q-4 (C) The population of a city at preset is 76162 which was 65673 before 5 years. Find out the rate of growth of population. [05]

OR

Q-4 (A) Bhautik chemicals fixes a target of producing 50,000 tonnes at the end of 7 years. If the production grows at a rate of 5% per annum. Find the present day production of the company. [05]

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

Q-4 (C) Rutu has obtained a loan to start unit. This loan is to be repaid in 10 installments of Rs. 1,75,000 each at the end of every year. If the rate of compound interest is 12%, find out the amount of the loan. [05]