SARDAR PATEL UNIVERSITY
B.B.A. (ITM) (3 Years) NC EXAMINATION
SEMESTER – I
Monday, 29ᵗʰ October 2018
2.00 p.m. to 4.00 p.m.
BUSINESS MATHEMATICS (UM01EBBI03)

Total Marks: - 60

Note:(1) Figures to the right indicate marks.   (2) Log table will be provided on request.

Q.1

(a)   **1.** Define the following terms with illustration: 08
  (a) Union of two sets
  (b) Transpose Matrix

  2. Let $A = \{a, b, c, e, g, h, j, k\}$, $B = \{b, c, d, g, f\}$ and $C = \{c, d, e\}$ then
  (a) Compute $A \cup B$ and $B - C$.
  (b) Find P (C).

(b) If $A = \begin{bmatrix} 1 & 0 & 4 \\ 2 & 3 & 2 \\ 0 & 3 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 1 & 3 \\ 2 & 0 & 5 \\ -1 & 4 & 2 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & 1 & 3 \\ 3 & 1 & 2 \\ 2 & 1 & 2 \end{bmatrix}$ then find   07

  (a) $A + B$ **(b)** $3A - 2B$ **(c)** $A + B + 2C$

Q.1   **OR**

(a) If $A = \begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix}$, then   08
  1. Find AB and BA.
  2. Show that $(A + B)^T = A^T + B^T$.

(b) If $U = \{1,2,3,4,5,6,7,8\}$, $A = \{1,2,4,5\}$, $B = \{3,4,5,7\}$ and $C = \{2,3,4,6\}$ then verify   07
following:
  (a) $(A \cup B)' = A' \cap B'$
  (b) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
  (c) Also find $(C')'$.

Q.2

(a) Do as directed: 08
  (a) Find $_5P_3 + {}_6P_2$
  (b) Find $_{10}C_3 \times {}_5C_2 + 0!$
  (c) $4 \cdot {}_nP_3 = 5 \cdot {}_{(n-1)}P_3$,then find n.

(b) How many three digit numbers can be formed using the digits 1, 2, 4, 5, 6 only one   07
time? How many of them are odd numbers? How many of them are even numbers? How
many are divisible by 5?

Q.2   **OR**

(a) How many different words can be formed using the following words without repetition?   08

  (1) BASEBALL   (2) ANAND   (3) MISSISSIPPI   (4) COMMERCE

(b) Out of 6 boys and 3 girls in how many ways committee of six members can be formed in which there are at least 3boys? — 07

Q.3

(a)
1. Write rules of differentiation. — 08
2. If the demand function is $x = 23 - 7p$,then find elasticity of demand at $p = 4$.

(b) Find $\frac{dy}{dx}$: — 07
1. $y = x^4 - 3x^3 + 2x^2 - 6x + 9$
2. $y = 4^x \cdot e^x$

Q.3   **OR**

(a)
1. Find $\frac{d^2y}{dx^2}$, if $y = \frac{x^7}{7} + 4x^2 - 9x + 4$. — 08
2. Find the demand (x) and price (p) for maximum revenue for a given demand law $p = 50 - 5x$.

(b) For a function$f(x) = 3x^3 - 9x$, find the maximum and minimum values of the function. — 07

Q.4

(a)
1. Explain the terms Annuity and Sinking fund. — 08
2. Mr. X deposited Rs. 18000 at 9% rate of compound interest for 5 years in a company. What amount will he get? How much interest will he get?

(b) Kamal purchased a machine on 1-1-2018 for Rs. 600000. The expected life the machine is 10 years. After that period he will have to buy a new machine. It is expected that he will have to pay the price 1.5times higher. In order to make this provision, what amount he should invest on 31st December every year for 10 years at 15% rate of compound interest? — 07

Q.4   **OR**

(a) TISCO Ltd. purchased a machine for Rs. 450000 on 1-1-2018. Its expected life is 5 years. After that period a new machine will cost 20% more. In order to provide for this, it was decided to create a sinking fund. On every 31st December a sum will be invested at 12% rate of compound interest. Find out this amount. — 08

(b) ABC Ltd. Fixes a target of producing 60000 tons at the end of 5 years. If the production grows at a rate of 7% per annum, find the present day production of the company. — 07

—— X ——

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