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N0. Of printed pages: 02

SARDAR PATEL UNIVERSITY
B.B.A. (ITM) (3 Years) EXAMINATION (SEMESTER – I) NC
Friday, 22nd April 2016
2.30 PM to 4.30 PM
UM01EBBI03: BUSINESS MATHEMATICS

Total Marks: 60

NOTE: Log table will be provided on request.

Q.1

(a) Explain the terms: **1)** Union of two sets **2)** Difference of two sets 04

(b) If $A = \begin{bmatrix} 3 & 4 \\ 5 & 2 \end{bmatrix}$ Then find $A^2 - 4A - 13I$. 05

(c) Let $A = \{1,3\}, B = \{5,6\}$ *and* $C = \{6,9\}$ then 06
1) Prove that $A \times (B \cap C) = (A \times B) \cap (A \times C)$
2) Find $A \cap B, A - B, A \cup B$.

OR

Q.1

(a) Explain the terms with example: **1)** Square Matrix **2)** Identity Matrix 04

(b) State and verify De Morgan laws by Venn Diagram. 05

(c) If $A = \begin{pmatrix} 4 & -5 & 3 \\ 3 & 3 & -2 \end{pmatrix}$, $B = \begin{pmatrix} 1 & -3 & -2 \\ 1 & -3 & -6 \end{pmatrix}$ then find **1)** $3A - 4B$ **2)** $2A + B$ 06

Q.2

(a) In how many ways four cards of (i) different suits (ii) same suit can be selected from 52 playing cards? 05

(b) How many arrangements can be made with the letter of the word ANANDPURA? In how many of them vowels occupy even places? 05

(c) Find n: ${}_nP_3 = 6 \cdot {}_nC_5$ 05

OR

Q.2

(a) Find the number n of distinct permutations that can be formed from all the letters of the words : 1) MISSISSIPPI 2) ALLAHABAD 3) COMPUTER 05

(b) Out of 6 boys and 4 girls in how many ways committee of five members can be formed in which there are at most 2 girls? 05

(c) Find n: **1)** $P(n,2) = 72$ **2)** $P(n,4) = 42P(n,2)$ 05

Q.3

(a) Write rules of differentiation. 04

(b) Find $\frac{dy}{dx}$: **1)** $y = x^3 - 3x^2 + 4x + 9$ **2)** $y = (2x^2 + 4x + 5)^8$ 06

(c) At which point the function $f(x) = x^2 - 2x + 5$ is minimum? Find the minimum value of $f(x)$. 05

Q.3 **OR**

(a) The demand function of a commodity is $p = 50 - \frac{5}{2}x$. Determine demand and price for maximum revenue. 04

(b) Find $\frac{dy}{dx}$: **1)** $y = t^3 + 3t^2, x = 2t + 12$ **)** $y = e^x . logx$ 06

(c) If the supply function is $x = 5 + 2p^2$, find elasticity of supply. Also find the elasticity of supply when $p = 3$. 05

Q.4

(a) Explain: Compound Interest and Annuity. 04

(b) What is an aggregate amount for Rs. 20,000 at 9% rate of compound interest for 5 years if the interest is compounded 06

1. Annually? 2. Semi-annually? 3. Quarterly?

(c) XYZ Ltd. Company Purchased a machine for Rs. 4, 50,000. 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 and to invest it at 12% rate of compound interest. Find out the sum to be transferred to the sinking fund on 31st December of every year. 05

Q.4 **OR**

(a) The population of a city at present is 76162 which was 65673 before 5 years. Find out rate of growth of population. 05

(b) Hindustan chemicals Ltd. issued 50,000 debentures each of Rs. 100 to be redeemed after 8 years. It was decided to create a sinking fund and invest it at 12% rate of compound interest. Find out the sum to be invested at the end of every year. 05

(c) Mr. A borrows Rs. 40,000 at the rate 15% of simple interest and invests it on the same day at 13% of compound interest. At the end of 5 years how much profit or loss will he have? 05

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