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SARDAR PATEL UNIVERSITY
B.B.A. (ITM) (3 Years) EXAMINATION (SEMESTER – I) / N C
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 : ${}_n P_3 = 6 \cdot {}_n C_5$ 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) $y = t^3 + 3t^2, x = 2t + 12$ 2) $y = e^x \cdot \log x$ 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
1. Annually? 2. Semi-annually? 3. Quarterly? 06
- (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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(2)