

Roll No. 

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Total No. of Pages : 02

Total No. of Questions : 07

BBA (Sem.-1<sup>st</sup>)**BUSINESS MATHEMATICS**

Subject Code : BB-102 (2007 to 2011 Batch)

Paper ID : [C0202]

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SIX questions carrying TEN marks each and students has to attempt any FOUR questions.

**SECTION-A****I. Answer briefly**

- a. What do you mean by Differentiation from first principle?
- b. Define adjoint of a matrix.
- c. Write a note on unit matrix.
- d. What do you understand by difference of two sets?
- e. Define limits of a function  $f(x)$ .
- f. If the roots of the equation  $2x^2 + 8x - m^3 = 0$  are equal. What is the value of  $m$ ?
- g. The sum of two numbers is 52 and their difference is 2. Find the numbers.
- h. Which term of the progression  $-1, -3, -5$  \_\_\_\_\_ is  $-39$ ?
- i. What will be the number of subsets of a set containing  $n$  elements?
- j. If  $xy = 1$  then what will be the value of  $y^2 + dy/dx$ ?

### SECTION-B

2. a) Define linear and quadratic equations.
- b) A firm processes  $x$  tonnes of output at a total cost
- $$C = \text{Rs}\{1/10x^3 - 5x^2 + 10x + 5\}.$$
- At what level of output will the marginal cost and the average variable cost attain their respective minima? (4,6)
3. a) Differentiate:  $e^x + 1/e^x - 1$
- b) Find  $dy/dx$  of  $y = x^3(\log x)^2$  (5,5)
4. In a school 28 students were singers, 30 tabla players, 42 flute players. Out of this population of 100 students, 15 could sing and play tabla, 20 tabla and flute, 15 singing and flute and 5 could all the three. Find out how many students were not playing all the three? (10)
5. Solve the following simultaneous system using matrices:
- $$\begin{aligned} 2x_1 - 4x_2 + 3x_3 &= 3 \\ 4x_1 - 6x_2 + 5x_3 &= 2 \\ -2x_1 + x_2 - x_3 &= 1 \end{aligned} \quad (10)$$
6. a) Twenty books are placed at random in a shelf. Find the probability that a particular Pair of books shall be: (5)
- i) Always together.
- ii) Never together.
- b) Insert 4 arithmetic means between 4 and 324. (5)
- $$4, -, -, -, -, 324$$
7. If the roots of the equation  $p(q - r)x^2 + q(r - p)x + r(p - q) = 0$  are equal show that  $2/q = 1/p + 1/r$ . (10)