

(Please write your Exam Roll No.)

Exam Roll No. 070903888/8

END TERM EXAMINATION

SECOND SEMESTER [B.COM] APRIL- MAY 2019

Paper Code: B.COM-102

Subject: Business Mathematics

(Batch 2017 Onwards)

Time: 3 Hours

Maximum Marks: 75

Note: Attempt any five questions.

- Q1 (a) The first and the last terms of an A.P. are 107 and 253. If there are 5 terms in this sequence, find the sum of sequence. (7)
(b) A boy agrees to work at the rate of one rupee on the first day, two rupees on the second day, four rupees on the third day and does on. How much will the boy get if he start working on the 1st of February and finishes on 20th of February? (8)
- Q2 An intelligence agency forms a code of two distinct digits selected from 0, 1, 2, ..., 9 such that the first digit of the code is nonzero. The code, handwritten on a slip, can however potentially create confusion, when read upside down-for example, the code 91 may appear as 16. How many codes are there for which no such confusion can arise? (15)
- Q3 Using Cramer's rule, solve the following system of equations for x, y and z. (15)
 $x + y + z = 5; \quad 2x + y - z = 2; \quad 2x - y + z = 2;$
- Q4 An amount of Rs. 5,000 is put into three investments at the rates of interest of 6%, 7% and 8% per annum respectively. The total annual income is Rs. 358. If the combined income from the first two investments is Rs. 70 more than the income from the third, find the amount of each investment by using matrix algebra. (15)
- Q5 In the planning of a restaurant, it is estimated that if there are places for 20 to 80 people, the daily gross profit will be Rs. 20 per place. However, if the seating capacity is above 80 places, the daily gross profit on each place will be decreased by 50 paisa times the number of places above 80. If x is the number of places in the seating capacity, express the daily gross profit as a function of x. Determine the continuity of the profit function at x=80. (15)
- Q6 (a) If $x = at^2$, $y = 2at$, Find d^2y/dx^2 . (5)
(b) Find all the points of local maxim and minima of the function: (10)
 $F(x) = x^5 - 5x^4 + 5x^3 - 1$
- Q7 (a) The marginal cost function of a firm is $MC = (\log x)^2$. Find the total cost of 100 units if the cost of Producing one unit is Rs. 22. (7)
(b) The elasticity of a function $y = f(x)$ is $\frac{3x}{(x-1)(x+2)}$. Determine the function if $y=6$ when $x=4$. (8)
- Q8 (a) A monopolist's demand function is $x=210-3p$, where x is the quantity demanded when price is Rs. p Per unit, with the average cost function: (7)
 $AC = x + 6 + \frac{10}{x}$
Find the consumer surplus at the price which monopolist will like to fix.
(b) A firm's marginal revenue function is $MR = 20e^{-x/10}(1 - x/10)$. Find the corresponding demand function. (8)

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