800 -/6/15/20

SF-247

February – March 2022
M. B. A. (Financial Administration) Examination

I Semester

BUSINESS MATHEMATICS

Time 3 Hours] [Max. Marks 90

Note : Attempt any two questions from Section A and attempt any three questions from Section B. Each question of Section A is of 15 marks and each question of Section B is of 20 marks.

Section A

1. Explain the concepts of Compounding, Discounting and Annuity. Also write its applications in management.

2. Explain the terms :
   (a) Demand Function.
   (b) Marginal Cost.
   (c) Universal Set.
   (d) Difference of Sets.
   (e) Transdental Function.

3. Write short notes on the following :
   (a) Applications of Matrix Algebra.
   (b) Marginal Analysis and Applications.
   (c) Economic Applications of Integration.

Section B

4. (a) A manufacturer has installed a new manufacturing plant to produce bearings. The total cost incurred for initial set up is Rs. 10 lakhs and additional cost for producing each bearing is Rs. 500. If the bearings are sold at Rs. 1,000 and during the first month operation 1500 units can be manufactured and sold then find : (i) Cost Function (ii) Revenue Function (iii) Profit Function (iv) Break Even Sales (v) Profit or Loss in 1st month.

   (b) Examine the continuity of the function $f(x)$ at $x = 1$ and $x = 2$ where :

$$f(x) = \begin{cases} 4 - 2x & \text{if } x \leq 1 \\ 2 & \text{if } 1 < x \leq 2 \\ 4x - 6 & \text{if } x > 2 \end{cases}$$

5. (a) If $y = 4x^3 - 18x^2 - 48x + 24$ find for what value is the function maximum or minimum ?

   (b) Given the demand function and cost function of a suitcase manufacturer are $p = 30 - 5x$ and $C = 10x$. Then :
   (i) Find the optimizing quantity and price.
   (ii) Calculate the profit.
   (iii) Also find the rate of tax which will maximize tax revenues.

6. (a) $\int \frac{\sin\sqrt{x}}{\sqrt{x}}\, dx.$

   (b) $\int \frac{\log \log e^x}{e^x}\, dx$

   (c) If the marginal cost of a firm MC = $60\sqrt{x}$ then calculate the total cost, average cost and the marginal cost of the firm at an output level of 9 units.

P. T. O.

7 Solve the following set of linear equation using matrix inversion method :

$$4x + 5y + z = 4$$
$$6x + 9y + 3z = 18$$
$$x + y + z = 10$$

8 (a) The sum of an infinite G. P. is p and the sum of the squares is q then find the first term and the common ratio of the series.

(b) Find the three numbers in A. P. such that the sum of the numbers is 30 and there product is 960