

School of Finance and Commerce

**Bachelor of Business Administration in Financial Investment Analysis
Semester End Examination - Jun 2024**

**Duration : 180 Minutes
Max Marks : 100**

Sem II - H1UB203T- F010203TA - H1UA202T - Business Mathematics

General Instructions

Answer to the specific question asked

Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

- 1) Explain matrix with the help of an example. K1(2)
- 2) Explain the different types of rate of interest, with the help of numerical example. K2(4)
- 3) Find the following integrals: K2(6)
 - i) $\int x^4 (x^3 + 3x^2 - 7) dx$
 - ii) $\int \frac{(x^3 + 2x + 5)}{\sqrt{x}} dx$
- 4)
$$A = \begin{vmatrix} 4 & -2 & 1 \\ 7 & 3 & 3 \\ 2 & 0 & 1 \end{vmatrix}$$
 Given, Find the Determinant of matrix A, Find the cofactors of all the elements. K3(9)
- 5) The total cost C (x) of a firm is : $C(x) = .005x^3 - .02x^2 - 30x + 5000$ Where x is the output. Determine: (i) The averages cost (ii)The marginal average cost (iii) The marginal cost (iv)The rate of change of MC with respect to x K3(9)
- 6) A radio manufacturer produces x sets per week at a total cost of Rs $\left(\frac{x^2}{25} + 5x^2 + 30x + 100\right)$. He is a monopolist and the demand for his product is $x=75-3p$, where p is the price in Rs per set. Show that the maximum net profit is obtained when about 30 sets are produced per week. What is the monopoly price. K5(10)
- 7) An oil company requires 12,000, 20,000 and 15,000 barrels of high-grade, medium-grade and low-grade oil, respectively, Refinery A produces 100, 300 and 200 barrels per day of high-grade, medium-grade and low-grade oil, respectively, while refinery B produces 200, 400 and 100 barrels per day of high-grade, medium-grade and low-grade oil, respectively. If refinery A costs Rs.400 per day and refinery B costs Rs. 300 per day to operate, analyze how K4(12)

many days should each be run to minimize costs while satisfying requirements?

- 8) If the demand for a certain commodity is $q = 500 - 2p$ ($0 \leq p \leq 250$), then i) determine where the demand is elastic, inelastic and of unit elasticity with respect to price. li) use the part i) to determine the intervals of increase and decrease of the revenue function and the price at which revenue is maximized. K5(15)
- 9) Solve the following system of equations by Gauss elimination method. $X - 4y - z = 11$ $2x - 5y + 2z = 39$ $-3x + 2y + z = 1$ K5(15)
- 10) Maximize $Z = x_1 + 3x_2 + 6x_3$ K6(18)

Subject to the constraints:

$$3x_1 + x_2 + 3x_3 \leq 30$$
$$2x_1 + 2x_2 + 3x_3 \leq 40$$
$$x_1, x_2, x_3 \geq 0$$