

JK Lakshmipat University Jaipur
INSTITUTE OF MANAGEMENT
 End Term Examination (Regular & Backlog), May 2022
 BBA, Semester II, 21-22

Roll No.

Course Name: Business Mathematics

Time: 2.5 hours

Max. Marks: 30

Course Code : AS1103

Instructions to students:

1. Use Graph paper for solving LPP.

2. Do not write anything other than your roll number on the question paper. All the best!!!!

Q.1	Short answer type questions (6 questions @ 1.5 marks)	09
Q.1A	Find $\frac{dy}{dx}$, if $y = \log(x^2 + 2x + 5)$	LO4
Q.1B	Evaluate $\lim_{y \rightarrow 7} \frac{y^2 - 4y - 21}{3y^2 - 17y - 28}$	LO3
Q.1C	In how many ways can the letters of the word 'ALLAHABAD' be arranged?	LO5
Q.1D	Which of the following relations are functions? Give reasons and justify your answer. (a) $R_1 = \{(1, 7) (2, 7) (4, 7) (6, 7)\}$ (b) $R_2 = \{(1, 2) (1, 3) (1, 4) (1, 5)\}$ (c) $R_3 = \{(x, y) (y, z) (z, t) (t, v)\}$	LO3
Q.1E	The total cost function of a firm is $C(x) = x^4/2 - 15x^3 + 8x + 100$ where x is the output. If the market demand function is given by $p = 1790 - 15x$, where p is the price per unit of output, find average cost and total revenue.	LO4
Q.1F	There are 7 books of business mathematics, 6 of economics and 2 of finance. In how many ways can these be placed on a shelf if the books on the same subject are to be Together?	LO5
Q.2A	JK Group advertised to hire a financial analyst. The company has received applications from 10 candidates who seem to be equally qualified. The company manager has decided to call only 3 of these candidates for an interview. If she randomly selects 3 candidates from the 10, how many total selections are possible?	02 LO5
Q.2B	Find $f'(x)$ at $x=5$, if $f(x) = \log 5x (9x^2 - 5x - 99)$	02 LO3

Q.3A	Out of 6 managers and 4 doctors, how many groups of 4 professionals can be formed such that at least 1 manger is always there?	02 LO5
Q.4A	Maximize $Z = 3x + 6y$ subject to $2x + 5y \leq 20$ $x + y \leq 5$ and $x \geq 0, y \geq 0$	04 LO6
Q.4B	The market department of ABC company recommends manufacture and market a new school bag. The financial department provides the following cost function (in Rs) $C(x) = 600 + 120x.$ The revenue function (in Rs.) is $R(x) = 15x + 0.005x^2$ - Find the marginal cost (MC) function - Find the marginal revenue (MR) function at $x=100$. - Find fixed and variable cost for both cases.	1.5+1.5+1 LO4
Q.5A	A publisher decides to use one section of its plant to produce two textbooks called Microeconomics and Macroeconomics. The profit made on each copy is \$12 for Microeconomics and \$18 for Macroeconomics. Each copy of Microeconomics requires 12 minutes for printing and 18 minutes for binding. The corresponding figures for Macroeconomics are 15 and 9 minutes, respectively. There are 10 hours available for printing and 10.5 hours available for binding. How many of each should be produced to maximize profit? Formulate the problem and solve graphically.	3+4 LO6