Satyug Darshan Institute of Engineering & Technology, Faridabad

Department of Management Studies

Academic year 2025-26

Programme: BBA DM	**Year & Semester**: 1st Year, Sem I
Course Name: Business Mathematics	**Course Code:** MTU-115-V
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Unit I

Short answer questions

Q.N.	Question	KL
1	Define sets, finite and infinite sets, singleton sets, null set, equal and equivalent sets	KL1
2	Briefly explain Universal set. Support your answer by giving a example.	KL2
3	Write down all the subsets of {2,4,5,8}.	KL3
4	Write the given set A= {x: x N and 4 < x < 10} in Roster form	KL3
5	If A= {1,2,3,4}, B= {2,4,5,8} and C= {3,4,5,6,7}, Find A (BC), A – (B - A) and (A B)'	KL3

Long answer questions

Q.N.	Question	KL
1	State and Prove De Morgan's law.	KL3
2	In a certain town the inhabitants speak Assamese and Bengali. If 64% can speak Assamese and 55%can speak Bengali. Find in percent how many can speak both?	KL3
3	In In a class of 25 students, 12 students have taken mathematics, 8 have taken Mathematics but not Biology. Find the number of students who have taken both Mathematics and Biology and the number of those who have taken Biology but not Mathematics. Each student has taken either Mathematics ot Biology or both?	KL3
4	A college awarded 38 medals in football, 15 in basketball and 20 in cricket. If these medals went to a total of 58 sportsmen and only three sportsmen got medals in all three sports, how many sportsmen received medals exactly two of the three sports.	KL3
5	In an office out of 400 employees 150 are men, 276 university graduates, 212 married persons, 94 male university graduates, 151 married university graduates. 119 married men and 72 married male university graduates. Fid the number of employees who are (i) Single women but not university graduate (ii) Unmarried university graduates (iii) Unmarried men but not university	KL3
6	Of the 100 students who appeared in BCom examination, 70 secure first-class marks in Business Mathematics and 60 got first class marks in Accountancy. If each student secured first class in atleast one subject, find the number of students who secured first class marks in –(i) Both the subjects (ii) Mathematics only (iii) Accountancy only	KL3
7	In a survey of 100 families, number of families who read three magazines A, B and C were found to be as follows: C only – 18, C but not B – 23, C and A – 8, C – 26, A – 48, and A and B – 8, none of the three – 24.Using set theory find the number of families who read magazine (i) B (ii) A and B or B and C (iii) A if they do not read magazine B (iv) B and C but not A	KL3

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Unit II

Short answer questions

Q.N.	Question	KL
1	Given log2= 0.30103, log3=0.47712, find log$\sqrt{18}$	KL3
2	Find the value of $log_{0.5}\,256$	KL3
3	Simplify $log_2\sqrt{6} + log_2\sqrt{\frac{2}{3}}$	KL3
4	The 5th term of an AP is 10 and 10th term is 0. Find the 20th term. Find the sum of first 20 terms.	KL3
5	For what values of k, the following series will be in arithmetic progression? $3k^2 + k + 1,\ 2k^2 + k,\ 4k^2 - 6k + 1$	KL2

Long answer questions

Q.N.	Question	KL
1	Simplify $\frac{(0.3)^{\frac{1}{3}}.(\frac{1}{27})^{1/4}.9^{1/6}(0.81)^{2/3}}{(0.9)^{2/3}.(\frac{1}{3})^{-2}.3^{-1/2}.(243)^{-1/4}}$	KL3
2	If pqr = 1, show that $\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}} = 1$	KL3
3	A manufacturing company installs a machine at a cost of Rs. 21000. At the end of 20 years, the value of the machine is Rs. 3000 only. Assuming constant yearly depreciation find the value of the machine after 7 years of installation?	KL3
4	A lamp lighter has to light 100 gas lamps. He takes 90 seconds to go from one lamp post to the next. Each lamp post burns 10cc of gas per hours. How much gas (in cc) has been burnt by 8:30 PM if the first lamp is lighted at 6:00PM?	KL3
5	Sum of three numbers in AP is 30. If 4, 10 and 16 are added to first, second and third terms, the new numbers form GP. Find the numbers.	KL3

Unit III

Short answer questions

Q.N.	Question	KL
1	If ${}^nP_5$: ${}^nP_3$ = 2:1, then find the value of n	KL3
2	Find n if ${}^{2n}C_3$: ${}^nC_3$ = 11:1	KL3
3	Expand $(x^2 + \frac{1}{x^2})^6$	KL3
4	Solve, $5x^2 - 5x + 30 = 0$	KL3
5	Solve, $x^4 - 10x^2 + 9 = 0$	KL3

Long answer questions

Q.N.	Question	KL
1	First three terms in a Binomial expansion are 1, 10 and 40 respectively. Find the expansion.	KL3
2	Expand $(x^2 - \frac{1}{x})^9$ and find the sixth term. Using binomial theorem find the value of $(99)^4$.	KL3

3	How many arrangements can be made of the letters of the word 'ARRANGEMENT'. In how many of these the vowels occur together	KL3
4	Out of 6 boys and 4 girls, a committee of 5 is to be formed. In how many ways can it be done if (i) Exactly two girls are included? (ii) At least two girls are included? (iii) At most two girls are included?	KL3
5	Solve the given equation, $\frac{4x+5}{x} - \frac{3x}{4x+5} = 2$	KL3

Unit IV

Short answer questions

Q.N.	Question	KL
1	Define zero matrix, square matrix, diagonal matrix, scalar matrix and identity matrix	KL1
2	Find the values of a, b, c and d if $\begin{bmatrix} 2a+b & a-2b \\ 5c-d & 4c+3d \end{bmatrix} = \begin{bmatrix} 4 & -3 \\ 11 & 24 \end{bmatrix}$	KL3
3	Differentiate the given function w.r.t x: $y = (x^2 - 4x + 5)(x^3 - 2)$	KL3
4	Find the matrices A and B if $2A + B = \begin{bmatrix} 4 & 3 & 7 \\ 7 & 5 & 6 \end{bmatrix}$ and $A - 2B = \begin{bmatrix} -3 & 2 & 1 \\ 1 & -1 & 2 \end{bmatrix}$	KL3
5	What do you mean by symmetric and skew symmetric matrix?	KL2

Long answer questions

Q.N.	Question	KL
1	Find the average cost function and the marginal cost function for each of the following total cost functions. Evaluate them at Q = 3 and Q = 5 where $TC = 3Q^2 + 7Q + 12$.	KL3
2	If the demand curve is $p = 20 - 2x$, where p and x are respectively the price and the amount demanded of a commodity, find the consumer's surplus when p = 6 and p =10.	KL3
3	Solve by Cramer's rule $x + y + z = 9$, $2x = 5y + 7z = 52$ and $2x + y - z = 0$.	KL3
4	If $A = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$, show that $A^3 - 3A - 2I = 0$ and hence find A^{-1}.	KL3
5	Solve the following set of simultaneous equations using matrices (Matrix inverse method) $2x + 4y - z = 9$, $3x + y + 2x = 7$, $x + 3y - 3z = 4$.	KL3