GANPAT UNIVERSITY

FACULTY OF COMPUTER APPLICATIONS

Programme	Master of Computer Applications	**Branch/Spec.**	Master of Computer Applications
Semester	I	**Version**	1.0.0.0
Effective from Academic Year	2024-25	**Effective for the batch Admitted in**	June 2024
Subject Code	P11A4FM	**Subject Name**	Foundations of Mathematics

Teaching scheme						**Examination scheme (Marks)**			
(Per week)	**Lecture (DT)**		**Practical (Lab.)**		**Total**		**CE**	**SEE**	**Total**
	L	TU	P	TW					
Credit	3	0	0	-	3	Theory	40	60	100
Hours	3	0	0	-	3	Practical	-	-	-

Objective:

- To prepare students for quantitative aptitudes which is essential for computer applications industry
- To get started with mathematical & analytical basics using discrete mathematics for applications in computer science.

Pre-requisites:

Basic Knowledge of Mathematics

Course Outcomes :

CO	Description
CO1	Apply set operations and differentiation techniques to solve mathematical problems.
CO2	Compute permutations, combinations, and probabilities for real-world scenarios.
CO3	Analyze and solve numerical problems using averages, percentages, profit–loss, and ratios.
CO4	Solve quantitative problems on partnership, chain rule, time–work, time–distance, and simple interest.

Mapping of CO and PO

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	–	2	–	–	–	2
CO2	3	3	2	2	–	–	-	2
CO3	3	2	2	–	–	3	2	2
CO4	3	2	2	–	2	3	-	2

Content:

Unit	SECTION – I	Hrs
1	**Set Theory :** Introduction, Concepts and Notations, Representation of Sets, Universal Set, Null Set, Singleton Set, Subset of set, Equality of two sets, Equivalent Sets, Power set, Disjoint	12

	Set, Set Operations : Venn Diagram, Union, Intersection; Compliment of Sets, Differences of two sets, Symmetric Differences, Cartesian Products, The Algebraic Laws of set theory. Set Identities: Distributive Law, DE Morgan's Law; Application of the set theory: cardinality or size of set; **Differentiation**: Introduction, Second order derivative, Stationary Values: Maximum and Minimum values; Uses of Derivative.	
2	**Permutation & Combinations** Factorial notation, Number of permutations, Number of combinations, Facts and formulae of permutation and combinations. **Probability:** Experiment and Random experiment, Sample space, Probability of Occurrence of an event, Results on probability	10
	SECTION – II	
3	**Average, Problems on Numbers, Problems on Ages** Facts and Formulae of Average, Analyze given conditions, Assume unknown numbers, Form equations, Find out ages from given conditions, **Percentage :** Concept of Percentage, Express x% as fraction, Express a/b as percent, Results on Population, Result on Depreciations. **Profit & Loss, Ration & Proportion :** Cost price, Selling price, profit and loss formulae, What is ration, what is proportion, Fourth proportion, Third proportion, Mean proportion, Comparison of ratio, Compounded ration, Componendo and dividendo, variation	12
4	**Partnership, Chain Rule** Concept of partnership, Ration of Division of gains, Working and sleeping partners, Direct proportion, Indirect proportion **Time & Work, Time & Distance** Facts and formulae for time and work, Facts and formulae for time and distance. **Simple Interest :** Concept of principal, concept of interest, Facts and formulae for simple interest	11

Practical Content: NA	
Text Books:	
1	Advanced Mathematics by Heena Timali, Books India Publication
2	QUANTITATIVE APTITUDE for competitive examinations by Dr.R.S.Aggarwal, S. CHAND publication
Reference Books:	
1	QUANTITATIVE APTITUDE for competitive examinations by ABHIJIT GUHA, Mc Graw Hill Education
2	GENERAL INTELLIGENCE AND TEST OF REASONING, Vikas Publishing House
Web References / MOOC / Certification Course	
1	https://www.math-only-math.com/types-of-sets.html
2	https://www.indiabix.com/online-test/aptitude-test/
3	https://www.tutorialspoint.com/discrete_mathematics/discrete_mathematics_sets.htm
4	https://www.geeksforgeeks.org/application-of-derivative-maxima-and-minima-mathematics/
Question Paper Scheme:	
	University Examination Duration: 3 Hours Note for Examiner: - (I) Questions 1 and 4 are compulsory with no options. (II) Internal options should be given in questions 2, 3, 5 and 6. **SECTION - I** Q.1 – 8 Marks Q.2 – 11 Marks Q.3 – 11 Marks **SECTION - II** Q.4 – 8 Marks Q.5 – 11 Marks

	Q.6 – 11 Marks