

Programme	B. Sc. Mathematics Honours			
Course Code	MAT1FM105(2)			
Course Title	<b>MATHEMATICS FOR COMPETITIVE EXAMINATIONS - PART I</b>			
Type of Course	<b>MDC</b>			
Semester	I			
Academic Level	100 - 199			
Course Details	Credit	Lecture/Tutorial per week	Practical per week	Total Hours
	3	3	-	45
Pre-requisites	Basic Arithmetic and Computational Skill			
Course Summary	The course is designed to equip students with essential arithmetic and problem-solving skills required for competitive exams. It covers topics ranging from fundamental arithmetic operations such as number systems, fractions, and roots to more advanced concepts like financial mathematics, time-speed-distance calculations, and problem-solving techniques..			

#### Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Apply mathematical methods to solve problems	Ap	P	Internal Exam/Assignment/Seminar/ Viva / End Sem Exam
CO2	Apply numerical skills in competitive examinations	Ap	P	Internal Exam/Assignment/Seminar/ Viva / End Sem Exam
CO3	Manage time in competitive examinations.	C	M	Internal Exam/Assignment/Seminar/ Viva / End Sem Exam
* - Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - Factual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)				

**Detailed Syllabus:**

<b>Module</b>	<b>Unit</b>	<b>Content</b>	<b>Hrs</b> (36+ 9)	<b>Ext. Marks</b> (50)
<b>I</b>	<b>Fundamentals of Arithmetic</b>		<b>9</b>	<b>Min 10</b>
	1	Number System		
	2	Number Series		
	3	Simple and Decimal Fractions		
	4	HCF and LCM		
5	Square root and Cube root			
<b>II</b>	<b>Basic Arithmetic Operations</b>		<b>9</b>	<b>Min 10</b>
	6	Simplification		
	7	Average		
	8	Ratio and Proportion		
	9	Problems based on ages		
10	Percentage			
<b>III</b>	<b>Financial Mathematics</b>		<b>9</b>	<b>Min 10</b>
	11	Profit and Loss		
	12	Discount		
	13	Simple Interest		
	14	Compound Interest		
15	Work and Time			
<b>IV</b>	<b>Time, Speed, and Distance</b>		<b>9</b>	<b>Min 10</b>
	16	Speed, Time and Distance		
	17	Problems based on trains		
	18	Boats and Streams		
19	Clock and Calendar			

<b>V</b>	<b>Open Ended</b>	<b>9</b>	
	Mixture or Allegation, Partnership, Pipes and Cisterns		

**References:** 1. Fast Track Objective Arithmetic, Rajesh Verma, Arihant Publications India limited, 2018 (Primary Reference).  
2. Objective Arithmetic for Competitive Examinations, Dinesh Khattar, Pearson Education, 2020.  
3. Quicker Objective Arithmetic, Dr Lal, Jain, Upkar's publication, 2010.

**Mapping of COs with PSOs and POs :**

	PSO5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO 1	2	0	3	2	3	2	3	1	2
CO 2	2	0	3	1	3	2	3	1	2
CO 3	2	0	2	2	2	2	2	1	2

**Correlation Levels:**

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

**Assessment Rubrics:**

- Assignment/ Seminar
- Internal Exam
- Viva
- Final Exam (70%)

**Mapping of COs to Assessment Rubrics:**

	Internal Exam	Assignment	Seminar	Viva	End Semester Examinations
CO 1	✓	✓	✓	✓	✓
CO 2	✓	✓	✓	✓	✓
CO 3	✓	✓	✓	✓	✓

Programme	B. Sc. Mathematics Honours			
Course Code	MAT2FM106(2)			
Course Title	<b>MATHEMATICS FOR COMPETITIVE EXAMINATIONS - PART II</b>			
Type of Course	<b>MDC</b>			
Semester	II			
Academic Level	100 - 199			
Course Details	Credit	Lecture/Tutorial per week	Practical per week	Total Hours
	3	3	-	45
Pre-requisites	Basic Arithmetic and Computational Skill			
Course Summary	The course "Mathematics for Competitive Examinations - Part II" is designed to prepare students for competitive exams by focusing on various reasoning and problem-solving skills. It covers a range of topics including non-verbal reasoning, verbal reasoning, spatial reasoning, and abstract reasoning, each module addressing different aspects of these skill sets.			

#### Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Apply mathematical methods to solve problems	Ap	P	Internal Exam/Assignment/ Seminar/ Viva / End Sem Exam
CO2	Understand the basic concepts of logical reasoning Skills	U	P	Internal Exam/Assignment/ Seminar/ Viva / End Sem Exam
CO3	Manage time in competitive examinations	C	M	Internal Exam/Assignment/ Seminar/ Viva / End Sem Exam
* - Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C)				
# - Factual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)				

**Detailed Syllabus:**

<b>Module</b>	<b>Unit</b>	<b>Content</b>	<b>Hrs (36+ 9)</b>	<b>Ex Marks (50)</b>
		<b>Non-Verbal Reasoning</b>		
<b>I</b>	1	Similarity of Pairs	<b>9</b>	<b>Min 10</b>
	2	What come Next		
	3	Odd One out		
	4	Coding and Decoding		
	5	Ranking Test		
<b>II</b>	<b>Reasoning Contd.</b>		<b>9</b>	<b>Min 10</b>
	6	Blood relations		
	7	Blood relations Contd.		
	8	Direction Sense Test		
	9	Direction Sense Test contd.		
	10	Logical Venn Diagram		
<b>III</b>	<b>Spatial Reasoning</b>		<b>9</b>	<b>Min 10</b>
	11	Figure analogy		
	12	Figure series		
	13	Figure Classification		
	14	Mirror and Water Images		
	15	Counting of figures		
<b>IV</b>	<b>Abstract Reasoning</b>		<b>9</b>	<b>Min 10</b>
	16	Cube and Dice		
	17	Logical and Analytical Reasoning		
	18	Geometry mensuration		
	19	Data Interpretation		
<b>V</b>	<b>Open Ended</b>			

	Alphabet and Number Sequence Test, Paper folding and paper cutting	9	
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**References:**

1. A Fast Track Course in MENTAL ABILITY, Amogh Goel, Arihant Publications India limited, 2016. (Primary Reference).
2. The Mental Ability, Logical Reasoning & Problem-Solving Compendium for IAS Prelims General Studies Paper 2 & State PSC Exams, Disha Experts, Disha Publications, 2018.
3. The Pearson Guide to Verbal Ability and Logical Reasoning for the CAT, Nishit K. Sinha, Pearson Education, 2014.

**Mapping of COs with PSOs and POs :**

	PSO5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO 1	3	1	2	1	2	0	1	1	0
CO 2	2	0	2	1	2	0	1	1	0
CO 3	0	1	2	1	2	0	1	1	0

**Correlation Levels:**

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

**Assessment Rubrics:**

- Assignment/ Seminar
- Internal Exam
- Viva
- Final Exam (70%)

**Mapping of COs to Assessment Rubrics:**

	Internal Exam	Assignment	Seminar	Viva	End Semester Examinations
CO 1	✓	✓	✓	✓	✓
CO 2	✓	✓	✓	✓	✓
CO 3	✓	✓	✓	✓	✓