

**GENERIC ELECTIVE COURSE 2:**  
**QUANTITATIVE ARITHMETIC AND REASONING**

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
V	5D02 MAT	2	2	2	20	5	25

**COURSE OUTCOMES**

CO1	Understand average, Problems on ages, Profit and loss and solves problems
CO2	Understand Profit and loss, Ratio and proportion, Chain rule
CO3	Comprehend Time and work, Time and distance and solves problems
CO4	Comprehend Problems on trains, Boats and streams, Calendar, Clocks

**5D02 MAT: Quantitative Arithmetic and Reasoning**

**Unit I** **(18 hours)**

Average, Problems on ages, Profit and loss, Ratio and proportion, Chain rule (Chapters 6, 8, 11, 12, 14 of the Text).

**Unit II** **(18 hours)**

Time and work, Time and distance, Problems on trains, Boats and streams, Calendar, Clocks (Chapters 15, 17, 18, 19, 27, 28 of the Text).

**Text**

R.S. Aggarwal, Quantitative Aptitude for Competitive Examinations, S. Chand.

### Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	Maximum Marks
I	17	20
II	16	
Total	33	

### Pattern of Question Paper

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 6 questions* (6 questions x Marks 2 each=12)
- Part C - Essay** (2 questions x Marks 4 each = 8)
- *Answer any 1 question* ( 1question x Marks 4 each=4)

- **Use of Calculators shall not be permitted for this course.**

## GENERIC ELECTIVE COURSE 3: LINEAR PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
V	5D03 MAT	2	2	2	20	5	25

### COURSE OUTCOMES

CO1	Understand General linear programming problem – canonical and standard forms of L.P.P, Solutions and fundamental properties of solutions of LPP.
CO2	Understand Graphical solution method, Simplex method, Duality in linear programming, Formulating a dual problem.
CO3	Understand General transportation problem, the transportation tables, Loops in transportation table and solves transportation problem
CO4	Understand Degeneracy in transportation problem, Transportation algorithm (MODI method) and solves problems

### 5D03 MAT: Linear Programming

#### **Unit I - Linear programming (20 hours)**

Formulation of LPP from daily life situations (simple cases only and there should not be any question from this topic in the End Semester Examination). General linear programming problem – canonical and standard forms of L.P.P, Graphical solution method, Simplex method. (Sections 2.1, 2.2, relevant topics from 2.3 and 2.4, 3.2, 3.4, 3.5, 4.1, 4.3 of the Text. Proofs of all theorems are omitted).

#### **Unit II - Transportation problems (16 hours)**

General transportation problem, the transportation tables, Loops in transportation table, Solution of a transportation problem, Finding an initial basic feasible solution, Degeneracy in transportation problem, Transportation algorithm (MODI method). (Sections 10.1, 10.2, 10.5, 10.6, 10.9, 10.12, 10.13 of the Text. Proofs of all theorems are omitted)

**Text**

K. Swarup, P.K. Gupta and M. Mohan, Operations Research (18<sup>th</sup> edition), Sulthan Chand and Sons.

**References**

1. J. K. Sharma, Operations Research Theory and Applications. McMillan
2. G. Hadley, Linear Programming, Oxford & IBH Publishing Company
3. H. A. Thaha, Operations Research, An Introduction (8<sup>th</sup> edition), Prentice Hall

**Marks including choice**

Unit	Marks in End Semester Examination	
	Aggregate Marks	Maximum Marks
I	17	<b>20</b>
II	16	
Total	<b>33</b>	

**Pattern of Question Paper**

- Part A - Short answer** (5 questions x Mark 1 each = 5)
- *Answer any 4 questions* (4 questions x Mark 1 each = 4)
- Part B - Short Essay** (10 questions x Marks 2 each = 20)
- *Answer any 6 questions* (6 questions x Marks 2 each=12)
- Part C - Essay** (2 questions x Marks 4 each = 8)
- *Answer any 1 question* ( 1question x Marks 4 each=4).
- **Use of Scientific Calculators below 100 functions ( that is, upto fx 99) shall be permitted for this courses.**