

|                              |                          |
|------------------------------|--------------------------|
| <b>Branch Name:</b>          | B.Sc. Mathematics        |
| <b>Program Code:</b>         | SC104                    |
| <b>Course Name:</b>          | Business Mathematics-VII |
| <b>Course Code:</b>          | 2SC1040621               |
| <b>Pre-requisite Course:</b> |                          |

### Course Objectives:

1. To understand the basic concept of Isomorphism of cyclic groups.
2. To understand the concept of Subgroup of a cycle group.
3. To know about two-person zero games.
4. To know about Dominance principles.

### Teaching and Examination Scheme:

| Teaching Scheme<br>(Hours per week) |                 |                  |        | Evaluation Scheme (Marks) |                          |                          |                          |                  |
|-------------------------------------|-----------------|------------------|--------|---------------------------|--------------------------|--------------------------|--------------------------|------------------|
| Lecture<br>(L)                      | Tutorial<br>(T) | Practical<br>(P) | Credit | Theory (Marks)            |                          | Practical (Marks)        |                          | Total<br>(Marks) |
|                                     |                 |                  |        | University<br>Assessment  | Continuous<br>Assessment | University<br>Assessment | Continuous<br>Assessment |                  |
| 2                                   | --              | --               | 2      | 35                        | 15                       | --                       | --                       | 50               |

### Subject Contents:

| Sr.<br>No | Topic                                                                                                                                                                                                                                                                                                                                                                                          | Total<br>Hours | Weightage<br>(%) |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|
| 1         | <b>Group Theory:</b> Properties of a cycle groups, Isomorphism of cyclic groups, Subgroup of a cycle group, Generator of a cycle group, Definition of a Homomorphism and its illustrations, Kernel of Homomorphism, Cayley's Theorem, Isomorphism of group, Groups of order four and six.                                                                                                      | 15             | 50               |
| 2         | <b>Game Theory (Only Example):</b> Introduction, Two-person zero games, Minimax and Maximin principles, saddle point theorems, mixed strategies, method for solution of $2 \times 2$ game, dominance principles, solution of games without saddle points by using dominance and then mixed strategies, graphical method of solving $2 \times m$ and $m \times 2$ game, L.P. solution of games. | 15             | 50               |

### Reference Books:

1. Abstract Algebra, I H Sheth, Prentice Hall of India (PHI) Publication.
2. Topics in Algebra, I N Herstein, Wiley Eastern Ltd.
3. Operations Research by Nita Shah, Ravi Gor and Hardik Soni, Prentice Hall of India.
4. Operations Research, by. J.K.Sharma. Macmillan Publishers India Ltd.

### List of Open Source Software/learning website:

1. <https://www.youtube.com/watch?v=MzS9cwY3aYc>
2. <https://www.youtube.com/watch?v=Emwet4gZnIs>
3. <https://www.youtube.com/watch?v=Hw2XkWIv7Ww>

**Course Learning Outcomes (CLO): On completion of this course, the students will be able to:**

| <b>CLO</b> | <b>Description</b>                                                                    | <b>Bloom's Taxonomy Level</b> |
|------------|---------------------------------------------------------------------------------------|-------------------------------|
| CLO1       | <b>Describe</b> Properties of a cycle groups.                                         | 1 Remembering                 |
| CLO2       | <b>Discuss</b> the knowledge on Kernel of Homomorphism.                               | 2 Understanding               |
| CLO3       | <b>Use</b> definition of a Homomorphism and using it <b>solve</b> the example of its. | 3 Applying                    |
| CLO4       | <b>Explain</b> Minimax and Maximin principles.                                        | 4 Analysing,                  |
| CLO5       | Know the Saddle point to <b>Justify</b> the application of its.                       | 5 Evaluating                  |
| CLO6       | <b>Create</b> an example of Game.                                                     | 6 creating                    |

### Mapping of CLOs with POs & PSOs

| <b>Course Learning Outcomes</b> | <b>Program Outcomes (POs)</b> |            |            |            |            |            |            |            |            |             |             |             | <b>Program Specific Outcomes (PSOs)</b> |             |             |             |
|---------------------------------|-------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-----------------------------------------|-------------|-------------|-------------|
|                                 | <b>PO1</b>                    | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> | <b>PO7</b> | <b>PO8</b> | <b>PO9</b> | <b>PO10</b> | <b>PO11</b> | <b>PO12</b> | <b>PSO1</b>                             | <b>PSO2</b> | <b>PSO3</b> | <b>PSO4</b> |
| <b>CLO1</b>                     | L                             | M          |            |            |            |            |            |            | L          | L           |             |             | L                                       | M           |             |             |
| <b>CLO2</b>                     |                               | M          |            |            |            | L          |            |            |            | L           |             |             | L                                       |             |             |             |
| <b>CLO3</b>                     | M                             | L          | L          |            |            |            |            |            | M          |             | L           |             | L                                       | L           |             |             |
| <b>CLO4</b>                     |                               | L          | L          |            | L          |            |            |            |            |             |             |             | L                                       |             |             | M           |
| <b>CLO5</b>                     | L                             | M          |            |            |            |            |            |            | L          |             |             |             |                                         |             | L           | L           |
| <b>CLO6</b>                     | L                             | M          | H          |            |            |            |            |            | M          |             |             | L           | L                                       | M           |             |             |

**H: High, M: Medium, L: Low**