

BCA23-M101 Discrete Structures in Computer Science

Max. Marks: 50
Min. Pass Marks: 20

Internal Assessment Marks :15[Theory (10) + Practical (05)]
External End Term Exam Marks :35[Theory (20) + Practical (15)]

Time : Theory (3 Hours), Practical (3 Hours)

Credit: 2

Course Objectives:

1. To study various fundamental concepts of Matrices.
2. To study and understand the Permutation and Combination.
3. To study the concept of trees.
4. To study the Graphs

Examiner Note: Examiner will set a total of NINE questions. Out of which FIRST question will be compulsory and the remaining EIGHT questions will be set from four units selecting two questions from each unit. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus. Candidate will have to attempt FIVE questions in all, selecting one question from each unit. Examination will be of three-hour duration.

Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration.

UNIT-I

An introduction to matrices and their types, Operations on matrices, Symmetric and skew-symmetric matrices, Minors, Co-factors. Determinant of a square matrix, Adjoint and inverse of a square matrix,

UNIT-II

Introduction to counting: Basic counting techniques – inclusion and exclusion, pigeon-hole principle, permutation, combination.

UNIT-III

Trees – General trees, directed trees, ordered trees, rooted trees, Binary tree, Infix, prefix & postfix representation of trees

UNIT-IV

Graphs: Basic terminology, Subgraph, Directed & undirected graph, Labeled graphs, Weighted graphs, Representation of graphs

UNIT-V (PRACTICUM)

In practical component the teacher concerned / instructor will ensure minimum 15 programs / case studies execution in during the laboratory work.



Suggested Evaluation Methods:

| Internal Assessment: | Theory | Practicum | End Term Examination: |
|---|--------|-----------|---|
| Class Participation | 4 | - | A three hour exam for both Theory and Practicum |
| Seminar/presentation/assignment/quiz/class test etc | - | - | |
| Seminar/Demonstration/Viva-voce/Lab records etc.: | - | 5 | |
| Mid-Term Exam | 6 | - | |
| Total | 10 | 5 | |

Suggested Readings:

1. C. Y. Young (2021). Algebra and Trigonometry. Wiley.
2. S.L. Loney (2016). The Elements of Coordinate Geometry (Cartesian Coordinates)(2nd Edition). G.K. Publication Private Limited.
3. Seymour Lipschutz and Marc Lars Lipson (2013). Linear Algebra. (4th Edition) Schaum's Outline Series, McGraw-Hill.
4. C.C. Pinter (2014). A Book of Set Theory. Dover Publications.
5. J. V. Dyke, J. Rogers and H. Adams (2011). Fundamentals of Mathematics (10th Edition), Brooks/Cole.
6. A.Tussy, R. Gustafson and D. Koenig (2010). Basic Mathematics for College Students (4th Edition). Brooks Cole
7. J. V. Dyke, J. Rogers and H. Adams (2011). Fundamentals of Mathematics, Cengage Learning.
8. A.S. Tussy, R. D. Gustafson and D. Koenig (2010). Basic Mathematics for College Students. Brooks Cole.