DISCRETE MATHEMATICAL STRUCTURES (Common to CSE & ISE)

Written by Administrator

Sunday, 08 November 2009 06:13 -

Sub Code

:

06CS34

IA Marks

:

25

Hrs / Week

:

04

DISCRETE MATHEMATICAL STRUCTURES (Common to CSE & ISE)

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| |

Exam Hours

:

| 03 |

Total Hrs

:

| 52 |

| |

Exam Marks

:

| 100 |

PART – A

UNIT 1:

1. Set   Theory: Sets and Subsets, Set Operations and the Laws of Set Theory, Counting and Venn Diagrams, A First Word on Probability, Countable and   Uncountable Sets

6 Hours

UNIT 2:

1. Fundamentals   of Logic: Basic Connectives and Truth Tables, Logic Equivalence – The Laws   of Logic, Logical Implication – Rules of Inference

7 Hours

UNIT 3:

1. Fundamentals   of Logic *contd*.: The Use of Quantifiers, Quantifiers, Definitions   and the Proofs of Theorems

6 Hours

UNIT 4:

1. Properties   of the Integers: Mathematical Induction, The Well Ordering Principle –
Mathematical Induction, Recursive Definitions

7 Hours

PART – B

UNIT 5:

1. Relations   and Functions: Cartesian Products and Relations, Functions – Plain and
One-to-One, Onto Functions – Stirling Numbers of the Second Kind, Special   Functions, The
Pigeon-hole Principle, Function Composition and Inverse   Functions

7 Hours

UNIT 6:

1. Relations   *contd.*: Properties of Relations, Computer Recognition – Zero-One Matrices and Directed Graphs, Partial Orders – Hasse Diagrams, Equivalence   Relations and Partitions

7 Hours

UNIT 7:

1. Groups: Definitions, Examples, and Elementary Properties, Homomorphisms, Isomorphisms, and Cyclic Groups, Cosets, and Lagrange's Theorem
2. Coding   Theory and Rings: Elements of Coding Theory, The Hamming Metric, The Parity Check, and Generator Matrices

6 Hours

UNIT 8:

1. Group   Codes: Decoding with Coset Leaders,   Hamming Matrices
2. Rings   and Modular Arithmetic: The Ring Structure – Definition and Examples, Ring Properties and Substructures, The Integers Modulo n

6 Hours

Text Book

   1. **Discrete   and Combinatorial Mathematics**, Ralph P. Grimaldi, 5th Edition, PHI/Pearson Education, 2004.

(Chapter 3.1, 3.2, 3.3, 3.4, Appendix 3, Chapter 2, Chapter 4.1, 4.2, Chapter 5.1 to 5.6, Chapter 7.1 to 7.4, Chapter 16.1, 16.2, 16.3, 16.5 to 16.9, and Chapter 14.1, 14.2, 14.3).

Reference Books

   1. **Discrete   Mathematics and its Applications**, Kenneth H. Rosen, 6th Edition, McGraw Hill, 2007.

   2. **Discrete   Mathematical Structures: Theory and Applications**, D.S. Malik   and M.K. Sen, Thomson, 2004.

   3. **Discrete Mathematics with Applications**, Thomas Koshy, Elsevier, 2005.
   4. **A   Treatise on Discrete Mathematical Structures**,   Jayant Ganguly, Sanguine Technical Publishers, 2006.

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