

CSE 1002: DISCRETE MATHEMATICS

(Classes with effect from --.---.2023)

REQUIRED COURSE TEXTBOOK:

1. DISCRETE MATHEMATICS AND ITS APPLICATIONS BY K.H.ROSEN(8e)

No Other Textbooks will be used or entertained.

Course format: 4 Classes / week/, 1 hr. / Class = 4 credits

Grading - external: 60 % Theory Exam

Grading - internal: 15 % Mid Term + 10% quizzes +10% assignments + 5% attendance = 40 %

Lesson Plan

Lecture Hour	Topics	Chapters Rosen	Problems to be discussed in class and Assignment problems
1	Syllabus Grading, Assignments, Examinations, Attendance Introduction Introduction to Discrete Mathematics, Discrete Structures, Introduction to Logic, Propositional Logic	Chapter 1(1.1)	Example-4,11,12
2	Propositional Logic	Chapter 1(1.1)	Exercise-No.5,11,13,14,29 Assignment-No.3,4,12,15,30,46
3	Propositional Equivalences	Chapter 1(1.3)	Exercise-No.18,25,30,34 Assignment-No.19, 20, 21, 22,23,26,27,28,29,31,32,33
4	Predicates and Quantifiers	Chapter 1(1.4)	Example-1,3,8,9,12,13,14,23,27
5	Predicates and Quantifiers	Chapter 1(1.4)	Exercise-No.1,5,9,25 Assignment-No.6,10,23,24
6	Nested Quantifiers	Chapter 1(1.5)	Example-1,2,3,4,6,9,12 Exercise-No.1,3 Assignment-No.2,4
7	Rules of Inference	Chapter 1(1.6)	Example-3,4,5,6,7,8,9,15,16
8	Rules of Inference	Chapter 1(1.6)	Exercise-No.3,5,7 Assignment-No.4,6,8
9	Introduction to Proofs	Chapter 1(1.7)	Example-1,3,8,9,11,12 Exercise-No.1,9,19 Assignment-No.2,20
10	Sets	Chapter 2(2.1)	Example-14,15,17,19 Exercise-No.11,21,23 Assignment-No.12,13,22,29
11	Set Operations	Chapter 2(2.2)	Example-10,11,14 Exercise-No.16,21

12	Functions	Chapter 2(2.3)	Example- 6,8,9,10,14,15,17,20,21,24,31,32
13	Functions	Chapter 2(2.3)	Exercise-No.1,4,10, 14, 22 Assignment- No.5,12,15,23
14	Sequences and Summations	Chapter 2(2.5)	Theorem1 Example-12,13,14,17, 18,19,21,23 Exercise-No.1,3,29,31,33 Assignment- No.2,4,34
15	Matrices	Chapter 2(2.7)	Example-7,8,9 Exercise-No.5,18,28 Assignment- No.26,27
16	Algorithms(Searching& Sorting Algorithms)	Chapter 3(3.1)	Example-3,4,5
17	Algorithms	Chapter 3(3.1)	Exercise-No.13,36,40 Assignment- No.14, 37, 41
18	The Growth of Functions	Chapter 3(3.2)	Example-1,2,11,13 Exercise-No.1,2,3,10,28,29
19	Complexity of Algorithms, Time Complexity	Chapter 3(3.3)	Example-2,3
20	Number Theory and Cryptography Divisibility and Modular Arithmetic	Chapter 4(4.1)	Theorem 5 Example-4, 6 Exercise-No.26 Assignment-No.27
21	Integer Representations and Algorithms	Chapter 4(4.2)	Example-1,3,4,5,6,7,12
22	Integer Representations and Algorithms	Chapter 4(4.2)	Exercise-No.1,4,5,25,27 Assignment-No.2,3,26,28
23	Primes and Greatest Common Divisors	Chapter 4(4.3)	Theorem 2 Theorem 6(Only Statement) Example-3, 13, 14, 15, 16, 17 Exercise-No.14, 16, 28, 30, 32, 39 Assignment- No.15, 17, 33, 40
24	Solving Congruences	Chapter 4(4.4)	Theorem 1 Example-1,3,11 Exercise-No.2,4,9,20,46 Assignment-No.1,3,10,47
25	Applications of Congruences	Chapter 4(4.5)	Example-3 Exercise-No.5,6,7
26	Cryptography	Chapter 4(4.6)	Example-1,2,3,4,8,9 Exercise-No.1,4,24 Assignment-No.2,5,25
27	Induction and Recursion Mathematical Induction	Chapter 5(5.1)	Example-3,6,8 Exercise-No.5,6,7,15,20,31,32 Assignment-No.8,16,21,33,34
28	Strong Induction and Well-Ordering	Chapter 5(5.2)	Example-2,4 Exercise-No.5,6
29	Recursive Definitions and Structural Induction	Chapter 5(5.3)	Example-1,3 Exercise-No.6,7,9 Assignment-No.5,8

30	Counting The Basics of Counting	Chapter 6(6.1)	Example-2,4,6,7,12,19 Exercise-No.10,24,27,28 Assignment-No.23,29
31	The Pigeonhole Principle	Chapter 6(6.2)	Example-5,10,11 Exercise-No.2,28
32	Permutations and Combinations	Chapter 6(6.3)	Example-1,5,12,13,14,15 Exercise-No.11,13,20,,23,35 Assignment-No.12,24,36
33	Binomial Coefficients and Identities	Chapter 6(6.4)	Corollary 1,2 Example-2,3,4 Exercise-No. 4,6,8 Assignment-No.3,7,9
34	Generalized Permutations and Combinations	Chapter 6(6.5)	Example-1,4,5,7,9 Exercise-No.6,7,14
35	Relations and their Properties	Chapter 8(8.1)	Theorem 1 Example- 6,7,9,10,11,12,13,15,16,17,22 Exercise-No.6,26 Assignment-No.7,27
36	Representing Relations	Chapter 8(8.3)	Example-3,5,6 Exercise-No.9,13,14 Assignment-No.10,15
37	Equivalence Relations	Chapter 8(8.5)	Theorem 1,2 Example-3,6,9,14
38	Equivalence Relations	Chapter 8(8.5)	Exercise-No.35,37 Assignment-No.36
39	Partial Orderings	Chapter 8(8.6)	Example-12,14,18,19,20
40	Partial Orderings	Chapter 8(8.6)	Exercise-No.20,22,33 Assignment-No.21,23,34