132 Math Exercises

Text Book: Discrete Mathematics and Its Applications

Chapter	Section	Material	Exercises
Chapter 1	**1.1**	**Not included:** - Precedence of Logical Operators p11 - Logic and Bit Operations Upto end of section	2, 3, 8(a,d,g), 11(a,c,e), 17, 28, 29(a,c), 31(c,e), 35(e), 40.
	1.3	**Not included:** - Propositional Satisfiability p. 30 Upto end of section	1(a), 3(a), 7, 9(c), 10(c), 11, 12, 14, 16, 19, 22.
	1.4	**Not included:** - Example 6 - Example 7 - Example 12 - Binding Variables P44 and P 45 - Translating from English into - Logical Expressions p. 48 upto end of section.	1, 5, 7, 11, 14, 15, 19.
	1.7	**Not included:** -Example 9 **Read: Mistakes in Proofs**	1, 3, 6, 9, 11, 15, 16, 17, 26, 31.
	1.8	**Not included:** Example 2 Example 5	1,6, 9, 14, 19, 29, 34.

		Example 8 Example 12 Example 15 Exampe 16 Proof Strategy in Action Up to end of section	
Chapter 2	**2-1**	Def.1, Ex.1, Ex.2, Ex.3, Ex.4, definitions for N, Z, etc., definitions for intervals, Def.2, Ex.6, Ex.7, Def.3, Ex.8, Ex.9, Th.1(no proof), Def.4, Ex.10, Def.5, Ex.13, Def.6, Ex.14, Ex.15, Def.8, Ex.17, Ex.18, Ex.20.Đ_ **Not included:** Example 5 Example 19 Example 22 Example 23	1(c, d) – 2 – 4 – 5- 6– 7 – 9 – 11 – 14 – 17– 19- 33 – 39 – 41 - 43

	2-2	Def.1, Ex.1, Def.2, Ex.3, Def.3, Ex.5, Def.4, Ex.6, Def.5, Ex.9, Table 1, Def.6, Def.7, Ex.15. **Not included:** Example 13 Example 14 P. 134 Computer Representation of Sets Up to end of section	1-3-5-7-16-19- 20 -25-
	2-3	All (except examples 3 and 5) until Def. 12 **not included**. Def 12, Up to end of section	**1,2,6(a),10,12 (a,c,d), 13(a,c,d), 14,15,20,22,24,25,28 29**
	2.5	**Not included:** Example 5 Theorem 2 Example 6 Def. 4	**1, 2, 3, 10, 11, 12, 15,16**
Chapter 5	**5.1**	Ex.1, Ex.2, Ex.3, Ex.4, Ex.5, Ex.6, Ex.8, **Not included:**	**4-5-6-8-9-12-18-20-28-31-32-38-39-43**

		Example 7 Example 10 until end of section	
	5.2		**Q1**: Let $\{a_n\}$ be a sequence of integers defined inductively as: $a_1 = 1,\ a_2 = 5, a_{n+1} = 2\, a_n + 3\, a_{n-1}\ , for\ all\ n \ge 2$. Prove that: $3^n \le a_{n+1} \le 2\,(3^n)\,, for\ all\ n \ge 1$ **Q2**: Let $\{a_n\}$ be a sequence of integers defined inductively as: $a_1 = a_2 = a_3 = 1, a_{n+2} = a_{n+1} + a_n + a_{n-1}$, for all $n \ge 2$. Prove that: a_n is an odd number for all n ≥ 1. **Q3**: Let $\{a_n\}$ be a sequence of integers defined inductively as: $a_0 = 1, a_{n+1} = a_n + 3^n\,, for\ all\ n \ge 0$, Prove that: $a_n = \frac{1}{2}(3^n + 1), for\ all\ n \ge 0.$ **Q4**: Let $\{x_n\}$ be a sequence defined as: $x_1 = 1\,,$ $x_2 = 2,\ x_{n+2} = \frac{1}{2}(x_{n+1} + x_n), \forall\, n \ge 1$ Prove that: $1 \le x_n \le 2.$ **Q5**: Let $\{y_n\}$ be a sequence defined as: $y_1 = 1, y_{n+1} = \frac{1}{4}(2\,y_n + 3), \forall\, n \ge 1.$ Prove that: $(a) y_n < 2\,, for\ all\ n \ge 1.$ $(b)\ y_n < y_{n+1}\,, for\ all\ n \ge 1.$ **Q6**: Let $\{a_n\}$ be a sequence defined as: $a_0 = 2\,, a_1 = 4,\ a_2 = 6, a_n = 5\, a_{n-3}, \forall\, n \ge 3.$ Prove that: $a_n\ is\ even, for\ all\ n \ge 0.$ **Q7**: Let $\{b_n\}$ be a sequence defined as: $b_0 = 1, b_1 = 2, b_2 = 3, b_n = b_{n-1} + b_{n-2} + b_{n-3},$ $\forall\, n \ge 3$ Prove that: $b_n < 3^n\,, for\ all\ n \ge 1.$
Chapter 9	**9.1**		1, 3, 6, 10, 11, 18, 26, 30, 32, 34(a,d,e), 36(d,e,h), 41, 50, 51, 52, 53, 56.
	9.3		2(c,d), 3(a,b), 4(a,c), 7(a,b), 8(a,c), 13(c), 14(a,b,c), 18, 22, 24, 26, 27, 31, 32.
	9.5		1, 3, 9, 16, 21, 22, 23, 26, 28, 36, 40(a), 42, 46, 47(b), 48(a), 55, 56(a,b)
	9.6		1, 6, 9, 10, 11, 14, 20, 22.