

# CSc 245 Final Review Questions Summer 2021

Each section will give "Review Questions", which will help you review important concepts but have no solutions in the back of the book, and "Review Exercises" which will be more applications of concepts and will have solutions in the back of the book.

## 1. Math Review - Review Homework 1.

## 2. Logic

- **Review Questions:**

- Pg 116: 1,2,3,4

- **Review Exercises:**

- 1.1: 1, 5, 11cfh, 17bdf

- 1.3: 5, 7ab, 11a, 21\*, 27\*, 33\*,

- \* Use equivalence tables and/or truth tables. Note some of the equivalence tables from the slides have additional rules that may make some of these trivial, don't use these when practicing!

## 3. Quantification

- **Review Questions :**

- Pg 117: 6,7

- **Review Exercises:**

- 1.4: 5bc, 7cd, 9bc, 11ef, 33ae

- 1.5: 5ab, 11abd,

## 4. Arguments

- **Review Questions:**

- Pg 117: 8, 9

- **Review Exercises:**

- 1.6: 3,9ad, 13bc,23

## 5. Proofs

- **Review Questions :**

- Pg 117: 10, 11, 12, 13, 16

- **Review Exercises:**

- 1.7: 5,9,17

## 6. Sets

- **Review Questions :**
  - Pg 196-7: 1, 2, 3, 4, 5 (ignore symmetric difference), 6,7
- **Review Exercises:**
  - 2.1: 5ab, 11df, 45bd
  - 2.2: 3bd, 13, 27ac.

## 7. Matrices

- **Review Questions:**
  - Pg 197: 17,18
- **Review Exercises:**
  - 2.6: 2b, 3c, 5, 27bc

## 8. Relations

- **Review Questions :**
  - Pg 666-667: 1, 2, 3, 6, 7, 10, 11, 12, 13, 14, 15.
  - Additionally, review operations to combine relations as well as strict partial orderings and total orderings.
- **Review Exercises:**
  - 9.1: 5ab, 13ab, 35bch
  - 9.3: 3, 7, 19, 27
  - 9.5: 1, 21, 27,
  - 9.6: 1, 5, 7, 11 (For each of these, also determine if it's a strict partial ordering and total ordering).

## 9. Functions

- **Review Questions :**
  - Pg 196: 8, 9, 10
- **Review Exercises:**
  - 2.3: 1, 7ab, 13ab, 23ab

## 10. Integers

- **Review Questions:**
  - Pg 325: 1\*, 2, 3, 7, 8, 9
    - \*Note,  $a \text{ div } b$  is equivalent to  $a|b$  and  $a \text{ mod } b$  is equivalent to  $a\%b$
- **Review Exercises:**
  - 4.1: 9, 13bd, 35
  - 4.3: 3ab, 17bc, 25ac, 27ac

11. Sequences & Strings

- **Review Questions:**
  - Pg 197: 12,13,15,16
  - Additionally, review arithmetic and geometric sequences.
- **Review Exercises:**
  - 2.4: 3ab, 25bd
  - 2.5: 1be

12. Mathematical Induction

- **Review Questions:**
  - Pg 399: 1, 2, 3, 4
- **Review Exercises:**
  - 5.1: 7, 15, 21, 31
  - 5.2: 7, 11

13. Counting

- **Review Questions:**
  - Pg 462-3: 1,2,3,4,5,6,8,9,13,15
  - Pg 593 12a
- **Review Exercises:**
  - 6.1: 3, 7, 13, 33cde, 51
  - 6.2: 5, 11, 15
  - 6.3: 9, 11, 13, 21bc, 25, 29, 35
  - 6.5: 9cde, 13, 33
  - 8.5: 3, 5, 7

14. Recursive Algorithms

- **Review Questions:**
  - Pg 245: 1, 2
  - Pg 399: 7, 10, 11, 12
- **Review Exercises:**
  - 3.1: 3, 9, 11
  - 5.3: 3ab, 7ab, 9, 25bc
  - 5.4: 7, 9, 19

15. Recurrence Relations

- **Review Questions:**
  - Pg 592-593: 1a, 6, 7, 8
- **Review Exercises:**
  - 2.4: 9 ad
  - 8.2: 1, 3 ac,
  - 8.3: 10

16. Finite Probability

- **Review Questions:**
  - Pg 520-521: 1
- **Review Exercises:**
  - 7.1: 1, 3, 5, 7, 9, 21