

CS1231S Discrete Structures
Assignment #1 Answer Sheets

AY2026/27 Semester 1

Name:

Tutorial group:

INSTRUCTIONS

1. Write your **Student Number** and **tutorial group number** (eg: T03B) above.
2. Submit only this document as a pdf file.
3. All questions must be answered in the boxes provided; no writing outside the box and no additional pages should be added (they will be disregarded).
4. Marks may be deducted for illegible handwriting and/or excessively long/complex answer.

Q1. (Total: 5 marks)

The argument is **Valid** / **Invalid** . (Circle the right answer or cross out the wrong answer.)

Proof:

- 1.
- 2.

Q2. (Total: 5 marks)

(a)

$B_2 =$; $B_3 =$; $B_4 =$

(b) The statement is **True** / **False** . (Circle the right answer or cross out the wrong answer.)

Q3. Prove: $\forall a, b \in \mathbb{Z} (a \geq 2 \rightarrow a \nmid b \vee a \nmid (b + 1))$

(Total: 5 marks)

Proof:

1.

Q4. $A \oplus B = (A \setminus B) \cup (B \setminus A)$

(Total: 6 marks)

(a) $\oplus$ is commutative.

(1)

1.

(b) $\oplus$ has an identity element, i.e., there exists a set I such that for all sets A , $I \oplus A = A$.

(3)

1.

(c) Every set A has an inverse A^{-1} under $\oplus$ such that $A \oplus A^{-1}$ equals the identity element.

(2)

1.