

EE1001 Foundations of Digital Techniques

Assignment 1

Due: Sep 12 (before lecture begins)

1. Is each of the following arguments valid or invalid? (Simply give your answer; explanation is not required.)
 - a) If you overslept, you'll be late. You didn't oversleep. Therefore, you aren't late.
 - b) All men are mortal. Her mother is a man. Therefore, her mother is mortal.
 - c) If you're in France, you're in Europe. You aren't in France. Therefore, you aren't in Europe.
2. Let $A = \{1, 3, 5, 7, 9\}$, $B = \{3, 6, 9\}$, and $C = \{2, 4, 6, 8\}$. Find each of the following:
 - a) $A \cup B$
 - b) $A \cap B$
 - c) $A \cup C$
 - d) $A \cap C$
 - e) $A \setminus B$
 - f) $B \setminus A$
 - g) $B \cup C$
 - h) $B \cap C$
3. Consider three sets A , B , and C , which satisfy the conditions: $C \subseteq A$ and $B \cap C = \emptyset$. There are several possibilities regarding the relationship between the three sets. Draw a Venn diagram for each of these possibilities.
4. Suppose $A = \{1, 2\}$ and $B = \{2, 3\}$. Find each of the following:
 - a) The power set of $A \cap B$;
 - b) The power set of A ;
 - c) The power set of $A \cup B$.
5. Use Venn diagram test to determine whether each of the following argument is valid:
 - a) Some books are interesting. Some books are logic books. Therefore, some logic books are interesting.
 - b) All moral beliefs are products of culture. No products of culture express objective truths. Therefore, no moral beliefs express objective truths.