INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY
HYDERABAD

Monsoon Semester (Aug-Nov), 2019
Discrete Structures (DS)

Tutorial VIII
September 12, 2019

Due: 16.09.19

Instructor: Dr. P. Kumar

INSTRUCTIONS:

Problems to be discussed in Tutorial in the week of Monday 16th Sep 2019.

1. Assume that E is the universal set. Prove the following identities
   1. $A \cap A = A$
   2. $A \cap \phi = \phi$
   3. $A \cap E = A$
   4. $A \cup E = E$
2. Show that $A \times (B \cap C) = (A \times B) \cap (A \times C)$
3. Prove that
$$(A \cap B) \cup (A \cap B^c) = A$$
$$A \cap (A^c \cup B) = A \cap B$$
4. Show that $A \times B = B \times A \iff (A = \phi) \vee (B = \phi) \vee (A = B)$.
5. Show that $(A \cap B) \cup C = A \cap (B \cup C)$ iff $C \subseteq A$.
6. Show the following.
   1. $(A + B) + C = A + (B + C)$
   2. $A + A = \phi$ and $A + \phi = A$
   3. $(A - B) - C = (A - C) - (B - C)$
   4. $(A \cap B) \times (C \cap D) = (A \times C) \cap (B \times D)$

Student's name:

End of Tutorial