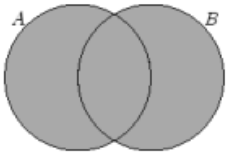
Exercise 1 and 2

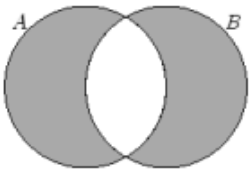
1(a)

(i) Set Operations:

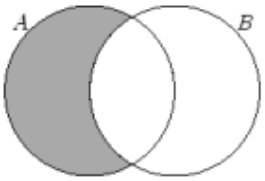
1) $A \cup B$



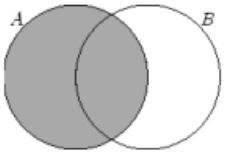
2) $A \Delta B$



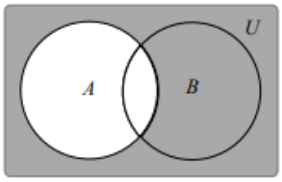
3) $A \setminus B$



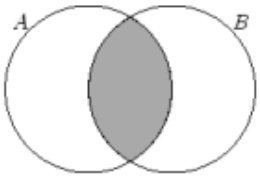
4) A



5) A^c

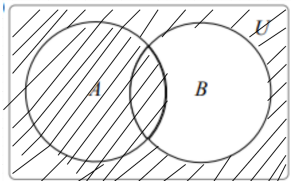


6) $A \cap B$

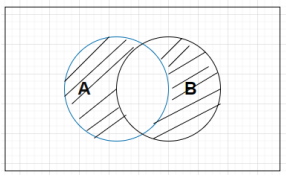


(ii) Expressions:

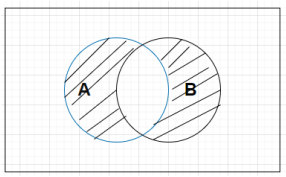
(a) $(A \cap B) \cup B^c$



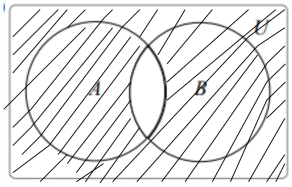
(b) $(A \cup B) \setminus (A \cap B)$



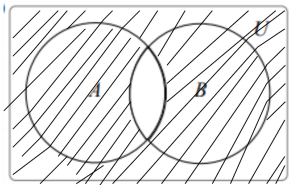
(c) $(A \setminus B) \cup (B \setminus A)$



(d) $(A \cap B)^c$



(e) $A^c \cup B^c$



1(b)

(i) $M \setminus I$

(ii) $M \cap I$

(iii) $M \Delta I$

(iv) $M^c \cap I^c$

Ex 2

(a) Schema Definition

- Building: `varchar/text`
- RoomNo: `int`
- Type: `varchar/text`
- Timeslot: `timestamp`
- Name: `varchar/text`
- Professor: `varchar/text`

(b) Primary Key

- **Primary Key:** Building, RoomNo

(c) Questions

(i) Yes

(ii) No, the information from this row is used in another table.

(iii) Yes

(iv) No, already exists.

(v) No, already exists.

(d)

Lectures cannot be held in the same room at the same time.

(e)

The `LECTURES` table should be split into two smaller tables to reduce redundancy, especially in columns like Name and Professor.