Due September 16, 2025 at 12:59 PM as PDF uploaded on Canvas. If it helps and if possible, you can write your responses directly on this document and upload it instead. **Show as much work as possible in order to get FULL credit.** *There 3 problems, and a fourth* **Colab problem** *will be forthcoming by tomorrow.*

Problem 1 *(2 points)*

Respond "T" (*True*) or "F" (*False*) to the following statements. Use the boxes provided. Each response is worth 1 point.

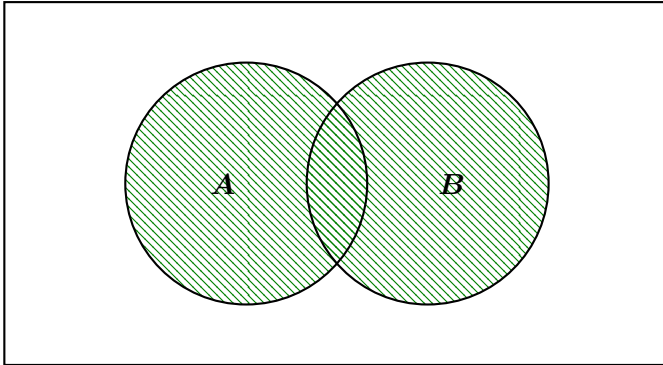**(i)** | F | An impossible event has a probability less than or equal to 0.

(ii) | T | A certain event is equivalent to the sample space of outcomes.
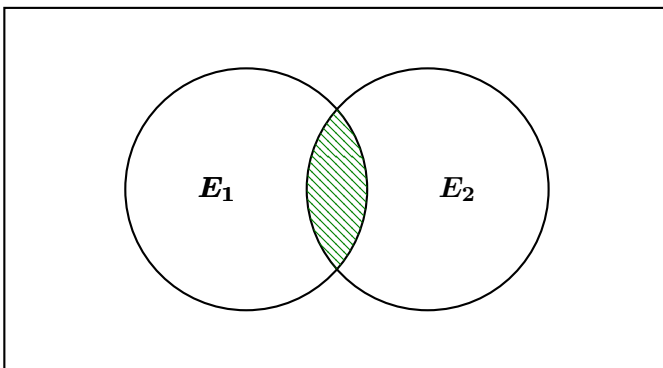
Problem 2 *(3 points)*

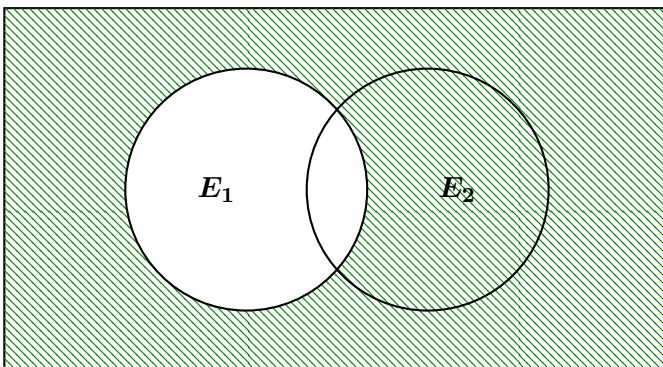Shade the area corresponding to the given events in the following Venn diagrams.

[1pt]   **(a)** $A \cup B$

[1]   **(b)** $E_1 \cap E_2$

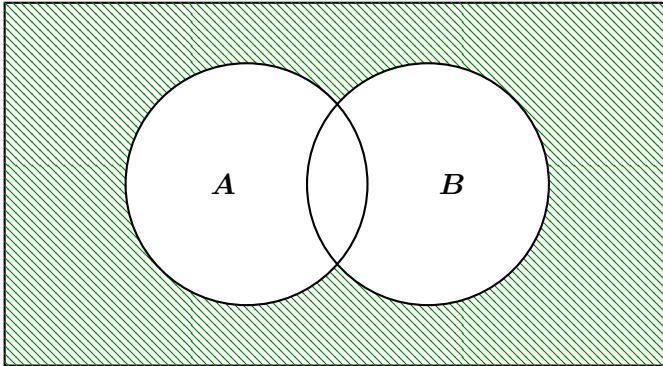*[1]*   **(c)** $\overline{E_1}$ (Note that $\overline{E_1} \equiv E_1^c$, i.e. the complement of E_1.)

Problem 3 *(3 points)*

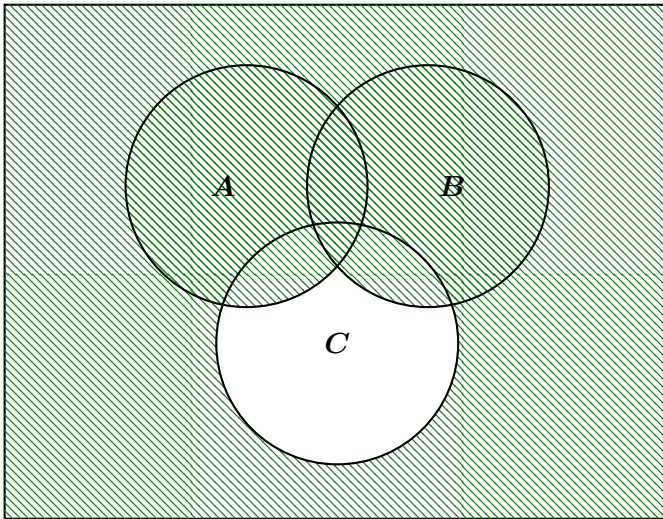**(a)** $\overline{A \cup B}$ [1]

(b) $A \cup B \cup \overline{C}$ [1]

(c) $\overline{AB} \cap C$ [1]