Solutions (Set Operations)

(1)

a) $\{\}$, $\emptyset$ because there is no common alphabet

b) $\{x \mid x$ is an alphabet of the English alphabets$\}$,
in other words, set of all English alphabets.

c) $\{a, e, i, o, u\}$

② a) $\{0, 4\}$

b) $\{1, 2, 3, 6\}$

c) $\{0, 1, 2, 3, 4, 5, 6\}$

d) $\{(1,0), (1,4), (1,5),$
$(2,0), (2,4), (2,5),$
$(3,0), (3,4), (3,5),$
$(5,0), (5,4), (5,5),$
$(6,0), (6,4), (6,5)\}$

e) $\{(0,1), (0,2), (0,3), (0,5), (0,6),$
$(4,1), (4,2), (4,3), (4,5), (4,6),$
$(5,1), (5,2), (5,3), (5,5), (5,6)\}$

f) $\{(5,5)\}$

(3) a) $\{a, c, d\}$

b) $\{e, g, h\}$

c) $\{\emptyset, \{e\}, \{g\}, \{h\}, \{e, g\}, \{e, h\}, \{g, h\}, \{e, g, h\}\}$

d) $\{\emptyset, \{a\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{c, d\}, \{a, c, d\}\}$

(4.) a) $A \cap B = D$ (Assume)

$D = \{0, 2, 4, 6\}$

Now $D \cap C = \{4, 6\}$

$\therefore A \cap B \cap C = \{4, 6\}$

b) $A \cup B = D$ (Assume)

$D = \{0, 1, 2, 3, 4, 5, 6, 8, 10\}$

$D \cup C = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$\therefore A \cup B \cup C = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

c) ~~$(A \cap B) \cup C$~~ $A \cap B = D$ (Assume)

$D = \{0, 2, 4, 6\}$

$D \cup C = \{0, 2, 4, 5, 6, 7, 8, 9, 10\}$

$\therefore (A \cap B) \cup C = \{0, 2, 4, 5, 6, 7, 8, 9, 10\}$

(5) a) $(A \cap B) = D$ (Assume)

$D = \{b, e, g\}$

$(B \cap C) = E$ (Assume)

$E = \{b\}$

$D - E = \{e, g\}$

$\therefore (A \cap B) - (B \cap C) = \{e, g\}$

b) $A \cap B = D$ (Assume)

$D = \{ b, e, g \}$

$D \cap C = \{ b \}$

$\therefore A \cap B \cap C = \{ b \}$

c) $A \cup B = D$ (Assume)

$D = \{ a, b, c, e, f, g, h \}$

$A \cap C = E$ (Assume)

$E = \{ a, b, h \}$

$D - E = \{ c, e, f, g \}$

$\therefore (A \cup B) - (A \cap C) = \{ c, e, f, g \}$