TUTORIAL 1
SCSJ3203 THEORY OF COMPUTER SCIENCE

Question 1

Let $A = \{1, \{2, 3\}, 4\}$, define each of the following statements either *true* or *false*.

(a) $3 \in A$
(b) $\{1, 4\} \subseteq A$
(c) $\{2, 3\} \subseteq A$
(d) $\{2, 3\} \in A$
(e) $\{4\} \in A$
(f) $\{1, 2, 3\} \subseteq A$

Question 2

Given $B = \{1, 2, 5, 8, 11\}$, determine whether each of the following statements *true* or *false*.

(a) $\{5, 1\} \subseteq B$
(b) $\{8, 1\} \in B$
(c) $\{1, 8, 2, 11, 5\} \subsetneq B$
(d) $\varnothing \subseteq B$
(e) $\{1, 6\} \subsetneq B$
(f) $\{2\} \subseteq B$
(g) $\{3\} \in B$
(h) $B \subseteq \{11, 2, 5, 1, 8, 4\}$

Question 3

If $X = \{1, 3, 6, 7, 9\}$, determine the values of:

(a) $|X|$
(b) Proper subset for X
(c) $P(X)$
(d) $|P(X)|$

Question 4

Let $U = \{a, b, c, d, e, f, g, h, i, j, k, l, m\}$, $A = \{a, c, f, m\}$ and $B = \{b, c, g, h, m\}$. Get the values of the following:

(a) $A \cap B$
(b) $A \cup B$
(c) $|A \cap B|$
(d) $|A \cup B|$
(e) $A - B$
(f) $B - A$
(g) A'
(h) B'
(i) $(A \cap B)'$
(j) $(A \cup B)'$

Question 5

Draw the Venn diagram for the following combinations of set A, B and C:

(a) $(A \cap B) \cup C$
(b) $(A \cup B) \cap C$
(c) $(A \cap B) - C$
(d) $(A - B) - C$
(e) $(A - B) \cup (A - C) \cup (B - C)$

Question 6

Name the sets for the following Venn diagrams;