UTM UNIVERSITI TEKNOLOGI MALAYSIA
SCHOOL OF COMPUTING
Faculty of Engineering

SCSI1013/SECI1013: Discrete Structure
[2019/2020 - Semester 1]
Due Date: 10th October 2019
TOTAL: 32 MARKS

TUTORIAL 1.1

1. Given set A ={1, 2, 3, … ,50}. List the elements of the following sets:
   a. $B = \{x | x \in Z,\ 2x^2 \in A\}\}$ (1.5 marks)
   b. $C = \{x | x \in R,\ x + (\frac{x}{2}) \in A\}\}$ (2.5 marks)
2. There are 20 people in your neighbourhood own pets. Five people own cats, rabbit and hamster. Three of them own only hamsters, five own only rabbit and another three own cat. How many total pets in your neighbourhood. (Use Venn Diagram) (4 marks)
3. Let A and B are sets, show that $(A \cap B) \cup (A' \cup B)' = A$ using properties of set. (4 marks)
4. Prove the following theorem using direct proof method.

   $P(x)$: a , b *are odd integers*

   $Q(x)$: $a \times b$ *is odd integer*

   Proof that $\forall x\big(P(x) \rightarrow Q(x)\big)$, for $x \in Z$ (5 marks)
5. Write the following statement using p, q, r and logical connectives.

   p : I shop online

   q : I purchase goods

   r : I receive my allowance

   a. I purchase goods whenever I receive my allowance, but I do not shop online. (3 marks)
   b. Although I receive my allowance, I neither shop online nor purchase goods. (3 marks)
6. Express the following statements using predicates, quantifier and logical connectives. (9 marks)
   a. All students that attend class on Monday attend class in the morning. (domain of discourse: All students at your college.)
   b. $x^2 + 2x - 3 = 0$, (domain of discourse: set of integers, Z)
   c. Some red flowers are edible. (domain of discourse: All flowers)

--- end of questions---