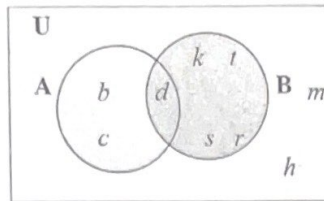# SECI1013: DISCRETE STRUCTURE
SEM 1 2023/2024

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Marks

11 / 15

Question 1 [6 Marks]

Given the Venn Diagram, answer the following questions:

a. List the elements of set A, B. $A \cup B = \{b, c, d, k, r, s, t\}$ (2 m) ✗

b. Find $|U| = 9$ (1 m)

c. List ALL the subsets of A. (3 m)

$A = \{\emptyset, \{b\}, \{c\}, \{d\}, \{b,c\}, \{b,d\}, \{c,d\}, \{b,c,d\}\}$

Question 2 [6 Marks]

Given $U = \{x \in Z, 0 < x \le 10\}$, $A = \{1,3,5,7,9\}$, $B = \{2,4,6,8\}$, $C = \{3,6,9\}$. Find:

a. $(A \cup B) \cap C = \{3,6,9\}$ (1 m)

b. $A' - B = \{10\}$ (1 m)

c. $B' \cap (U \cap C') = \{1, 5, 7\}$ (2 m)
   $[1,3,5,7,9] \, [1,5,9]$

d. $(A \cap C) \times (C - A) \times \{a\} = \{(3,6,a), (9,6,a)\}$ (2 m)
   $\{3,9\} \quad \{6\}$

Question 3 [3 Marks]

Given the following propositions, answer the following questions:

p: $(x+1)/3$
q: x is odd integer

a. Write a compound proposition using logical connectives for the statement:

$(x+1)/3$ if and only if x is not odd integer (1 m)

$p \longleftrightarrow \neg q$

b. Construct the truth table for the compound proposition in (a) (2 m)

P	q	$\neg q$	$p \longleftrightarrow \neg q$
T	T	F	F
T	F	T	T
F	T	F	T
F	F	T	F

T   T   T
T   F   F
F   T   F
F   F   T