SECI1013: DISCRETE STRUCTURE
SEM 1 2023/2024

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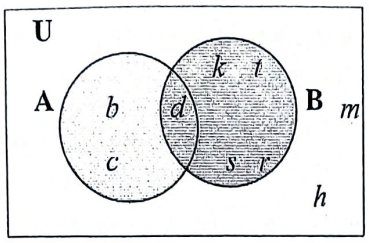
Marks 15/15

Question 1 **[6 Marks]**

Given the Venn Diagram, answer the following questions:



a. $A = \{b, c, d\}$
$B = \{d, k, r, s, t\}$

b. $|U| = 9$

~~$A = \{\emptyset\}$~~

a. List the elements of set A, B. (2 m)

b. Find |U| (1 m)

c. List **ALL** the subsets of A. $A = \emptyset, \{b\}, \{c\}, \{d\}, \{b,c\}, \{b,d\}, \{c,d\}, \{b,c,d\}$ (3 m)

Question 2 **[6 Marks]**

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

a. $(A \cup B) \cap C = \{3,6,9\}$ (1 m) $(U \cap C') = \{1,2,4,5,7,8,10\}$
$B' = \{1,3,5,7,9,10\}$

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

c. $B' \cap (U \cap C') = \{1,5,7,10\}$ (2 m) $(A \cap C) = \{3,9\}$
$(C - A) = \{6\}$

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

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 $p \leftrightarrow \sim q$ (1 m)

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

p	q	~q	p ↔ ~q
T	T	F	F
T	F	T	T
F	T	F	T
F	F	T	F