SECI1013: DISCRETE STRUCTURE
SEM 1 2023/2024

Name : Chan Ying Jia
Student ID : A23CS0213 Section : 2 (3) / 6 / 7 / 9
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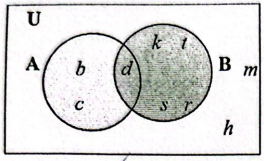
Marks 15/15

Question 1 **[6 Marks]**

Given the Venn Diagram, answer the following questions:



a. List the elements of set A, B. (2 m)
A = {b, c, d}, B = {d, k, t, s, r}
b. Find |U| (1 m)
|U| = 9
c. List ALL the subsets of A. (3 m)
subsets of A = {}, {b}, {c}, {d}, {b,c}, {b,d}, {c,d}, {b,c,d}

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:*

B' = {1,3,5,7,9,10} C' = {1,2,4,5,7,8,10}

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

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

p ↔ ~q

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