SKM's JASHBHAI MAGANBHAI PATEL COLLEGE OF COMMERCE,

GOREGAON (WEST),

Programme: F.Y.B.Sc.I.T. (SEM-I)

Course: Computational Logic and Discrete Mathematics

Topic: Set Theory

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1. U= {201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220};

A= {202, 204, 205, 209, 211,213, 215, 218, 219, 220}

B={ 205, 211, 219, 220}; C={201, 203, 204, 210, 211, 212, 217}

i. C-B

ii. $(A \cup C) \cap B$

iii. C^c

iv. Is AUB = U

v. $A \cap B$

2. Define Cartesian product set.

Let P= {11,12,13} and Q= {50,60 }

Then find **i.** $P \times P$ **ii.** $Q \times Q$ **iii.** $P \times Q$ **iv.** $Q \times P$

3. Use the set-roster notation to indicate the elements in each of the following sets.

i. $S = \{n \in \mathbf{Z} | n = (-1)k$, for some integer k$\}$.

ii. $T = \{m \in \mathbf{Z} | m = 1 + (-1)^i$, for some integer i$\}$.

iii. $U = \{r \in \mathbf{Z} | 2 \leq r \leq -2\}$

iv. $V = \{s \in \mathbf{Z} | s > 2$ or $s < 3\}$

v. $W = \{t \in \mathbf{Z} \mid 1 < t < -3\}$

vi. $X = \{u \in \mathbf{Z} \mid u \leq 4$ or $u \geq 1\}$

4. Let A = {c, d, f, g}, B = { f, j }, and C = {d, g}.

Answer each of the following questions. Give reasons for your answers.

a. Is $B \subseteq A$?

b. Is $C \subseteq A$?

c. Is $C \subseteq C$?

d. Is C a proper subset of A?

5. Let A = {a, b, c}, B = {b, c, d}, and C = {b, c, e}.

a. Find $A \cup (B \cap C)$, $(A \cup B) \cap C$, and $(A \cup B) \cap (A \cup C)$. Which of these sets are equal?

b. Find $(A - B) - C$ and $A - (B - C)$. Are these sets equal?

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