Important Questions 9

Question 1: Let $A = \{0,1,2,3\}$,
$R = \{(0,0), (1,1), (1,2), (2,1), (2,2), (3,3)\}$, and

$D = \{(0,0), (1,2), (0,3), (1,1), (2,2), (3,3)\}$.

[a] (A, R) is a poset. [b] *D* is an equivalence relation on *A*.

[c] $\{\{0\}, \{1,2\}, \{3\}\}$ is a partition of *A*. [d] $\{\{1,2\}, \{0,3\}\}$ is a partition of *A*.

Question 2: Let Z be the set of integers. Which of the following is a partition of Z ?

[a] The set of positive even integers and the set of odd integers.

[b] The set of positive odd integers and the set of even integers.

[c] $\{\{2x: x \in Z\ , x \geq 0\}, \{x: x \in Z\}\}$.

[d] $\{\{2x + 1: x \in Z\}, \{2x : x \in Z\}\}$.

Question 3: Let Z be the set of integers, $R \sqsubseteq Z \times Z$ defined as follows:

$(x, y) \in R$ iff $y = x$ mod 5. Then

[a] $[0] = \{\cdots, -4,1,5,9,10, \cdots\}$. [b] $[1] = \{\cdots, -5,1,6, \cdots\}$.

[c] $[2] = \{\cdots, -3,2,7, \cdots\}$. [d] $[4] \cap [3] \neq \emptyset$.