

Name: ..... SSN: ..... Row: ....

Do **only 4** of the following questions and show your work. Circle **clearly** the questions which you want to be graded. Circle **only 4**.

**Question 1:** (5 points) Let  $A$  be the interval  $(-1, 2]$ . Find  $A \cap \mathbb{Z}$ .

**Question 2:** (5 points) Let  $\{a_n\}_{n=1}^{\infty}$  be defined by  $a_n = 2^n$ ,  $\forall n \in \mathbb{N}$ . Let  $S = \{1, 4\}$ . Find  $\sum_{i \in S} a_i$ .

**Question 3:** (5 points) Find  $\{a, b, \{a, b\}\} - \{a, b\}$  and  $\mathcal{P}(\{a, b, \{a, b\}\} - \{a, b\})$ .

**Question 4:** (5 points) Let  $X = \{1, 2, 3\}$ . Give an example of a binary relation on  $X$  which is not symmetric and not antisymmetric at the same time.

**Question 5:** (5 points) Let  $R$  be the relation on  $\mathbb{Z}$  defined by:  $a R b$  iff  $a \leq b + 5$ . Prove by a counter example that  $R$  is not transitive.