

**Quiz Three, MTH 213 , Fall 2011**

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**QUESTION 1.** Let  $A = \{1, B, 3\}$ . Circle the correct answer

- (i) Let  $G = \{(1, 1), (B, B), (3, 3)\}$  be a binary relation on  $A$ . THEN
- a)  $G$  is only symmetric      b)  $G$  is only reflexive      c)  $G$  is only transitive      d)  $G$  is an equivalence relation.
- (ii) Let  $F = \{(1, 1), (B, B), (3, 3), (2, 3), (3, B), (2, B)\}$ . Then
- a)  $F$  is an equivalence relation      b)  $F$  is reflexive and transitive but not symmetric      c)  $F$  is only transitive      d) None of the previous is correct.
- (iii) The number of all binary relations on  $A$  is
- a) 7      b) 8      c) 511      d) None of the previous is correct.

**QUESTION 2.** a) Let  $A$  as in QUESTION one. Write down an equivalence relation (call it  $T$ ) such that  $A$  has (under  $T$ ) exactly one equivalent class.b) Let  $A$  as in QUESTION one. Write down an equivalence relation (call it  $H$ ) such that  $A$  has (under  $H$ ) exactly two equivalent classes.**QUESTION 3.** Let  $A, B$  be sets. Prove that  $A \cap B^c = A \setminus B$ . (you may consider  $U$  as a universal set if you need to).**Faculty information**

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