Department of Mathematics

Assignment # 02

Subject: Discrete Mathematics **Course Code:** MTH211 **Due Date: 28-07-2020**
Instructor: Dr. Atiq ur Rehman **Class:** BSM-II **Max. Marks:** 10

Instructions:
a) *Please follow the due date strictly.*
b) *Similarity of a solution with other students may reduce your marks.*

Question # 1:

Let $A = \{1,2,3,4\}$, $B = \{a,b,c\}$, $C = \{x, y, z\}$. Consider the relations R from A to B and S from B to C as follows:

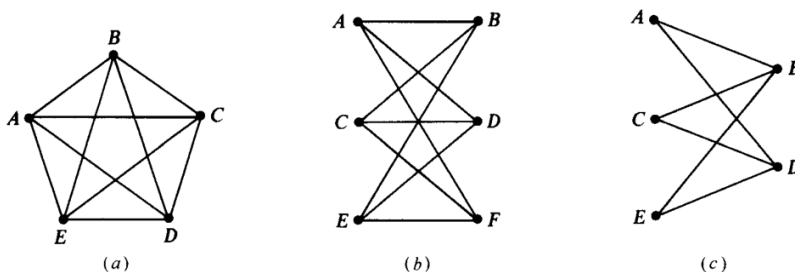$$R = \{(1, b), (3, a), (3, b), (4, c)\} \text{ and } S = \{(a, x), (c, y), (a, z)\}$$

a. Draw the diagrams of R and S.
b. Draw the diagrams of $R \circ S$ and $S \circ R$.
c. Find the matrix of each relation R, S and $R \circ S$.
d. Write R^{-1} and the composition $R \circ S$ as sets of ordered pairs.

Question # 2

Define equivalence relation. Let $S = \{1, 2, 3,..., 18, 19\}$ and let R be the relation on S defined by "xy is a square" for $(x, y) \in S \times S$. Then prove R is an equivalence relation.

Question # 3

Consider the graphs K_5, $K_{3,3}$ and $K_{2,3}$ in figure given below. Find and draw an Euler (traversable) path or an Euler circuit of each graph, if it exists. If it does not, why not?

Academic Honesty Requirements:

Available online at https://www.mathcity.org/atiq/sp20-mth211