



COMSATS University Islamabad

Attock Campus

Department of Mathematics

Assignment # 02

Subject: Discrete Mathematics
Instructor: Dr. Atiq ur Rehman

Course Code: MTH211
Class: BSM-II

Due Date: 28-07-2020
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:

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

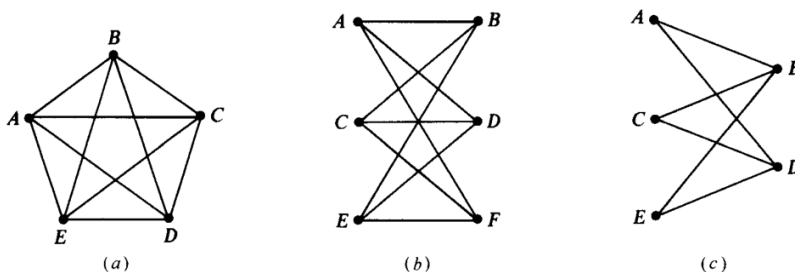
- a. Draw the diagrams of R and S .
- b. Draw the diagrams of $R \circ S$ and $S \circ R$.
- c. Find the matrix of each relation R , S and $R \circ S$.
- d. Write R^{-1} and the composition $R \circ S$ as sets of ordered pairs.

Question # 2

Define equivalence relation. Let $S = \{1, 2, 3, \dots, 18, 19\}$ 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:

You are encouraged to work with others in the completion of assignments, but it doesn't include copying. However, in the spirit of Academic Honesty, which includes crediting others for their contribution to your work, please include one of the following statements with every submitted assignment on title page:

1. I worked alone on this assignment.
2. I worked with the following: List their full names. Include their relationship to you if they are not also a member of this class.