RIPHAH INSTITUTE FOR COMPUTING AND APPLIED SCIENCES

Bachelor of Science in Computer Science
Discrete Structures

Assignment 01

NAME:		**Sap Id:**	

Question	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Total**
Obtained Marks									

1. **Let R and S be the following relations on the set A = (1, 2, 3, 4), R= {(1, 1), (1, 3), (3,2), (3, 4), (4, 2)) and S = {(2, 1), (3, 3), (3, 4), (4, 1)). Find the following composition relations**
   a) **RoS**
   b) **SoR**
   c) **RoR**
   d) **SoS**

2. **5. Let R be the relation defined on the set of natural numbers N by the equation 3x + y = 12, that is, R= {(x, y): 3x+y= 12).**
   a) **Write R as a set of ordered pairs. Find its domain and range.**
   b) **Find R^{-1}**

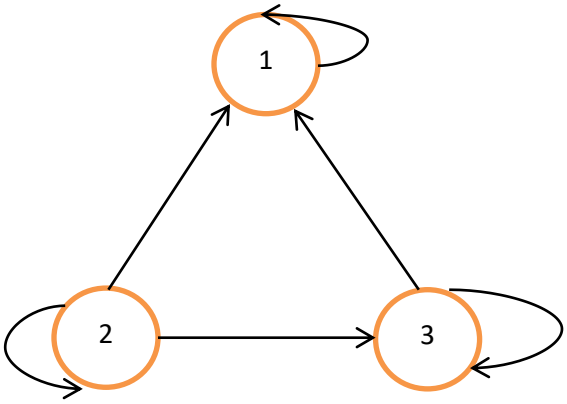
3.
   a. **Use a Venn diagram to illustrate the subset of odd integers in the set of all positive integers not exceeding 10**
   b. **Use a Venn diagram to illustrate the set of all months of the year whose names do not contain the letter R in the set of all months of the year.**
   c. **Use a Venn diagram to illustrate the relationship $A \subseteq B$ and $B \subseteq C$.**
   d. **Use a Venn diagram to illustrate the relationships $A \subset B$ and $A \subset C$. 17. Suppose that A, B, and C are sets such that $A \subseteq B$ and $B \subseteq C$. Show that $A \subseteq C$.**

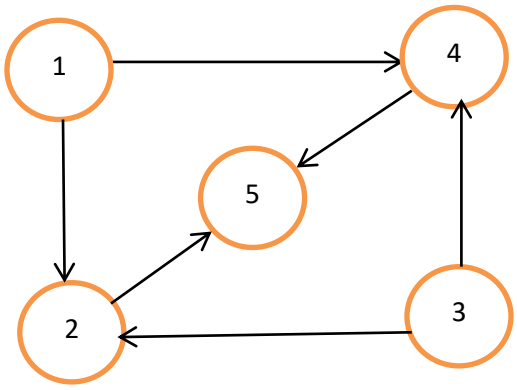
4. **If a Relation R on a set A is Symmetric, prove that the Relation R^2 is also symmetric.**

5. **Let A = (a, b, c) be a set. Determine whether the relation R whose matrix M_R is given, is an equivalence relation.**

$$M_R = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

6. **Find the Relations determined by the following Digraphs A and B.**





7. Find at least three different sequences beginning with the terms 1, 2, 4 whose terms are generated by a simple formula or rule.
8. Find at least three different sequences beginning with the terms 3, 5, 7 whose terms are generated by a simple formula or rule.