TMC-104_ Unit-1
Assignment-1

1. **Show that "less than and equal to" is a partial ordering relation on the set of integers.**
2. **If f: $\mathbb{R}^+ \rightarrow \mathbb{R}^+$ and g: $\mathbb{R}^+ \rightarrow \mathbb{R}^+$ be functions defined by $f(x) = \sqrt{x}$ and $g(x) = 3x + 1$ $\forall\, x \in \mathbb{R}^+$. Find gof and fog.**
3. **If $(x) = x^2$, $g(x) = x + 1$ and $h(x) = x - 1$ are the functions, then find $gofoh$ and $fogoh$.**
4. **Show that if R is an equivalence relation on set A, then R^{-1} is also an equivalence relation on set A.**
5. **If A & B are any two sets then A-B =A ⇔A∩B =∅.**
6. **Out of 450 students in a school, 193 students read science, 200 student read Commerce, 80 students read neither. Find out how many read both.**
7. **Let A={1,2,3,4} & R={(1,1),(1,2),(2,1),(2,2),(2,3),(2,4),(3,4),(4,1),(4,3)} then construct diagraph and matrix of the relation. Find its transitive closure by using Warshall's Algorithm.**
8. **Let A={2,3,4,6,12,36,48} be a nonempty set and R bet the Poset of divisibility defined on A that is if a,b € A then a divides b. Draw Hasse diagram.**
9. **Let f:R→R and g:R→R where R is the set of real no. find fog and gof, where f(x)=x^2 and g(x)=x+4 state wheather these functions are injective, surjective and bijective.**
10. **Show that the function f:Q→Q s.t. f(x)=3x+4 is invertible and find its inverse.**
11. **Show that the f(x,y)=x^y is a primitive recursive function**
12. **Construct the divides relation on each of the sets S={1,2,3,4,6,9} and draw Hasse diagram for each relation and find (a) All maximal and minimal elements (b) Greatest and least elements.**
13. **If a mapping f:A→B is one-one and onto then f^{-1} is also one-one and onto.**
14. **Prove that [0,1] is not countable.**
15. **If R be a relation in the set of integers $\mathbb{Z}$ defined by**

$R = \{(x, y): x \in \mathbb{Z}, \mathrm{y} \in \mathbb{Z}, \mathrm{x} - \mathrm{y} \text{ is divisible by } 3\}$.

Then prove that R is an equivalence relation