Q1. Check the relations whether it is Reflexive, Irreflexive, Symmetric, Asymmetric, AntiSymmetric and Transitive Relation and justify your answer.

A={1,2,3,4}

Relations	Reflexive	Irreflexive	Symmetric	AntiSymmetric	Asymmetric	Transitive
$R_1 = \Phi$						
$R_2 = A \times A$						
$R_3 = \{(1,1),(1,2),(2,1),(2,2),(3,4),(4,1),(4,4)\}$						
$R_4 = \{(1,1),(1,2),(2,1)\}$						
$R_5 = \{(2,1),(3,1),(3,2),(4,1),(4,2),(4,3)\}$						

Q2. Show whether the relation $(x,y) \in R$, if $x \geq y$ defined on the set of +ve integers is a partial order relation.

Q3. Which of the followings are partial order relation.
(a) R = { (a,b) | a,b $\in$ Z , a < b}
(b) R = { (a,b) | a,b $\in$ Z , a $\leq$ b}
(c) R = {(a,a),(b,b)} , A ={a,b}
(d) R = {(1,1),(1,2),(2,1)} , A = {1,2,3}

Q4. Which of the followings are Equivalence relation on given set A.
A = {1,2,3,4,5}
(a) R = {}
(b) R = A $\times$ A
(c) R = {(1,1),(3,5),(5,4),(1,5),(5,1)}
(d) R = {(1,1),(2,2),(3,3),(4,4),(5,5),}

Q5. Given relation is Equivalence relation or not.
R = {(a,b) ; |a-b| is even}   a,b $\in$ A
A = {1,2,3,4,5}

Q6. Draw the Hasse diagram and calculate the number of lines
(a) A = {1,2,3,4,5,6,}
      < A,/ >
(b) < D60, / >
(c) < P(A), $\subseteq$ > A ={1,2,3}
(d) < D105, />
(e) <P(X), $\subseteq$ >   X = {a,b,c,d}
(f) < 1,2,3,6,9,18,54 />

Find the answer with the explanation for Question no. 7 to Question no 11

7. The number of onto functions (surjective functions) from set X = {a,b,c,d,e,f} to set Y = {1,2,3} is -----------
    a. 540
    b. 36
    c. 729
    d. 192

8. Let A = {1, 5, 8, 9} and B {2, 4, 3} And f={(1, 2), (5, 4), (8, 2), (9, 4)}. Is f a surjective function?
    a. Yes
    b. No

9. Let A = {7,8,9} and B = {7,8,9} and f is onto from A to B then which of the following is correct?
    a. F is one to one

    b. F if bijective
    c. F may be one to one or many to one
    d. None of these.

10. If f : A →B is an onto function then range of f is:
    a. Subset of B
    b. A
    c. B
    d. Cannot be determined

11. Is the given function onto? g : R → R defined by g(x) = 1 + x2
    a. Yes
    b. No
    c. Cannot decide

12. f(x) = √x and g(x) = x2. What will be range of (g ° f)(x)?

13. f and g are both defined on the set of real numbers and c is a constant f(x) = cx − 3 g(x) = cx + 5 If (f ° g)(x) = (g ° f)(x) for all values of x, what is the value of c?

14. Given f(x) = √ (x + 2) and g(x) = ln (1 − x 2), find domain of (g ∘ f) (x).

15. State whether the following statement is True/False.
   "Composite functions are commutative."