TIME : 2:30 HRS | Seat No.__________

H615NDM.

MARKS :75

Note : 1) All Question are Compulsory
2) All Questions Carry Equal Marks
3) Figures to the Right side Indicate Marks.

Q1.A) Attempt any 4 (each of 5 marks) 20M

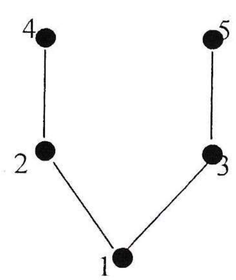
1. If the function f:IR→IR defined as f(x)= ₹ $\frac{2x-3}{7}$ ∀x∈IR, then show that f is bijective Hence find f^{1}
2. Verify whether the function f:N→N defined as f(x) = 4x+1 for all X∈ *N*
   a) One-to-one b) Onto
3. Determine whether each of these function is a bijective from R to R.
   a) F(x) = 2x+1 c) $f(x) = x^2+$
   b) $f(x) = x^2+$ d) $f(x) = 3x^3+7$
4. If $f(x) = x^2-4x+2$ and g(x) = 3x=7
   Find the composite function defined by fog(x) & gof (x)
5. Iff:IR→IR is defined by f(x) = 2x+3 then show that is bijection and hence f^{1}
6. If f(x) = 9-2x & $g(x) = 5x-4x^2-3$ find the composite function defined by fog (x) and (gof) (x)

Q.2 Attempt any 4 (each of 5 marks) 20M

1. Let R be the relation defined A= {1,2,3,4} by R={(1,1),(1,2),(2,1),(2,2),(2,3),(3,3),(3,4), (4,3) (4,4)} write down M[R] for R
2. Relation R defined on set A= {0,1,2,3} XRY <=> x=y find if Relation is Refleseive, symmetric transitive.
3. Let f: A→B and A=B, $f(x) = x^2 +2x+3$ find f^{1}
4. Let A= {1,2,3,4,5,6} let R={(a,b) la=b mod 2}, Is R an equivalence relation.
5. Let A= {1,2,3,} the relation R=AxA is R Transitive ? Justify
6. Let R on the set of integers defined as XRY if and only if 3x + 4y is divisible by 7,x,y,∈z show that R is an equivalence relation.

Q-3. Attempt any 4 (each of 5 marks) 20M

1. Let A={a,b,c,d} for partition p;P={{a}, {b,c},{d}} of A, write the equairalence reation induced.
2. Let A= {1,2,3,4,} and R={<1,2>,<2,3>,<3,4>,<4,4>, <4,5>}find R*, transitive closure and draw its graph.
3. Let A={1,2,3,4} and R={<1,2>,<3,1>,<2,3>,<3,4>} find R* by using warsmall's algoritm.
4. Let A= {1,2,3,4,5} and R be a partial order relation defined as R={(1,1), (2,2), (3,3), (4,4), (3,1), (4,3), (4,2), (4,1), (2,1)} find hasse diagram of poset A.
5. Determine the partial order relation R and MR whose Housediagram is given as.



6. Consider the lattice represented by following hasse diagram; determine whether it is distributire of not with justification.

Q-4. Attempt any 4 (each of 5 marks) 15M

1. Draw Hasse diagram ofo lattice D12. Is It a distributive lattice.
2. In a connected planar simple graph G there are 20vertices, each of degree 3. Find the number of region in the graph.
3. Give an example ofo Retlexive and symmetric by not Transitive.

4. Let A={1,2,3,4} and R be a partial order relation whose M[R] is given by

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

5. Let s={2,4,6,8,10,12} for a,b∈s define a a≤b if a/b show that (s,≤) is a poset. Also draw hasse diagram

6. Let s be relation on R defined on R such the ∀X,Y∈X y<=>X-y is an integer.