TIME : 2:30 HRS

Seat No._____

G 515 N CL0 S .

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 3 (each of 5 marks) 15

1. Find AxB, BxA if
   A= {4,5,8} B={1,2,3,5}
2. Prove that for any 3 sets A,B and C
   A x (B∪C) = (AxB) ∪ (A∪C)
3. Write algebraic proof of
   A∪(B-A) = A∪B
4. Prove (A-B) ∪ (A∩B) = A
5. Prove
   (A-B) ∪ (B-A) = (A∪B) – (A∩B)
6. Write Principle of Duality.

Q.2 Attempt any 3 (each of 5 marks) 15

1. Let A={0,1,2,3,4} and defined a function f:A→A such that for all X∈A f(x) = $(x^3 +2x+4)$ mod 5 find the co domain.
2. If A= {0,1,2,3,4} and difne function f:A→A and g:A→A such that for each X∈A
   F(x)= $(X+4)^2$ Mod 4
   g(x) = X^2 +3x+1 mod5
   Does f=g?
3. If f(x) = $(2x-5)^{1/2}$ and g(x) = $5X^2$ – 3 find the composite function defined by (fog) (x) and (gof) (x) verify whether (fog) (x) = (got) (x)
4. Determine whether this function is objective from R to R
   i) F(x) = 2x+1
   ii) F(x) = x^2+1
5. Verify whether the function d: Z→Z defined as f(x) = 4x-1 for all X∈Zp is
   a) One to One b) onto
6. Determine whether this functions form z to z is one – to one
   1. F(n) = n-1
   2. F(n) = n^2+1

Q3. Attempt any 3 (each of 5 marks) 15M

1. Lef A={1,2,3,4) let R= {<1,2>,<1,3>,<1,4>,<2,3>,<3,1>,3,3>, <4,2>} and s= {<1,3>,<2,2>,<3,2>,<4,2>} find.
   i) Ro(sos)
   ii) Is Ros = SoR?
2. If A={1,2,3} and R= {c,1), (1,2), (2,1), (2,2) 2,3) (3,1), (3,3>4) find m(R) and $(MR)\}^2$
3. If A={1,2,3} and B= {4,5,6) and R_1 = (1,1). (2,2), (3,2), (3,3)} and R_2= {(4,4),(5,5),(6,6)} find the matrix $m(R_1)$ X $m(R_2)$.
4. Let A={1,2,3} and R be a relation on a defined by XRY<=> x≤y find R and draw its diagraph.
5. Find matrix and diagraph of a relation R={(x,y)/xRy is 1x-y1=1} on a set A={1,2,3,4}.
6. Let A={1,2,3} the relation R=AxA is R transitive? Jastify.

Q.4. Attempt any 3 (each of 5 marks) 15M

1. Let A={1,2,3,4,5,6} let R={(a,b)} a≅b mod 2} Is R an equivalence relation.
2. Let R be a relation on Z, defined by xRy its 5x+6y is devisible by 12, for x,y∈ zshow that R is an equiralence relation on Z.
3. Let A={1,2,3,4} and R={<1,2>, <2,3>,<3,4>} find R* tramsitive clouser and draw its graph.
4. Let A= {1,2,3,4} and R={<1,2>, <2,1>,<2,3>,<3,4>} find R* using warshalls algoritm.
5. 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),(5,5), (5,3),(3,1), (4,3),(4,2),(4,1), (2,1)} find lass diagram of paset A.

∈AxB, xRy such that x/y find ordered pair of $R\&R^{-1}$

Q5. Attempt any 3 (each of 5 marks) 15M

1. Find the relation R defined on set ∧={2,3,4,5,6,7,8} AS xRy<=>x/y.
2. If A={1,2,3,4-20} and R is defined as ∀x,y∈A, xRy <=> $\frac{Y}{X} - Y$ find distinct equiralence classes.
3. Detemine the value of i) (3.5) ii) (-2,4) iii) (3,143)
4. Find inverse of function δ (x)=(3x+2)/(x-1)
5. Find f^{1} if . f(x)=n(x-2).
6. Determine whether f:R→ R are on to if δ(x) = x+1

********** BEST OF LUCK **********