L-(1)

TIME : 2:30 HRS

Seat No.____________

H615NDM

MARKS :75

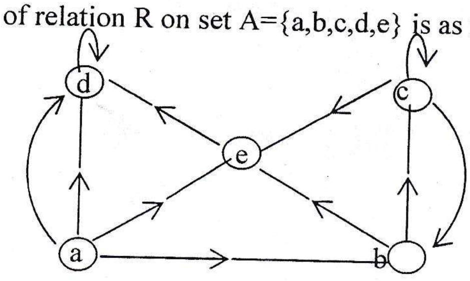
Note : 1) All Question are Compulsory
2) All Questions Carry Equal Marks
3) Figures to the Right side Indicate Marks.

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

1. If F I IR →IR is defined by f(x) = 2x+3; then show that f is bijection & hence find f^{1}.
2. Let f(x) = x^2 +1 & g(x) = $\frac{1}{x-1}$ then find fog (x).
3. If the f(x) = (2x-5)½ and g (x) = $5x^2$ -3 find the composite function by fog (x) & Gof (x). verify whether (fog) (x) = (gof) (x)
4. Determine whether each of these function is a bijective from R to R
   a) f(x) = 4-3x   b) f(x) = x^5+1
   c) f(x) = (x+1) / (x+2)   d) f(x) = x
5. Verify whether the function δ:R→R defined as f(x) = 4x-1 for all X∈R is
   a) one-to-one   b) onto
6. Determine whether each of these function form z to z is one to one
   a) F(n) = n-1   b) f(n) = n^2+1
   c) f(n) = m^3 d) f(n) = (n/z)

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

1. Let A={0,1,2,3,4} let R= { <1,2>,<1,3>,<1,4>,<2,3>,<3,3>,<4,2>} & δ={<1,3>, <2,2>,<3,2>, <4,2>} find.
   i) Ro (Sos)   ii) IS Ros = SoR?
2. If A= {1,2,3} & R= {(1,1), (1,2) (2,1) (2,2), (2,3) (3,1) (3,3) } find M(R) & $[M(R)]^2$
3. If A= {1,2,3} & B={4,5,6} and R_1= {1,1),(1,2),(2,2),(3,2),(3,3)}& R_2 ={(4,4),(5,5),(6,6)} find the matrix m(R_1) X m(R_2)
4. Let A= {1,2,3} & R be a Relation on A defined by xRY <=> X≤Y find R and draw its diagraph.
5. The diagraph of relation R on set A={a,b,c,d,e} is as follows.



   Find relation R & also obtain matrix of R.
6. Let A= {1,2,3,4,5,6}, Let R= {(a,b) la=b mod2} is an equiralence relation?

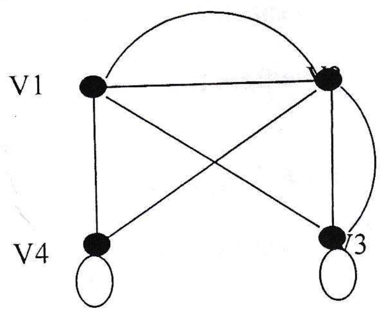
Q-3. Attempt any 4 (each of 5 marks) 20M

1. Let f :A→B and A=B=R, δ(x) = X^4+ 1 find f^{1}.
2. Let R= {(1,1), (1,3), (2,2), (2,4), (3,3), (3,1), (4,4), (4,2)} be the relation on A= {1,2,3,4,} show that R is an equiralence relation on A. Also write down the equivalence classes with respect to relation R.
3. Let R be a relation on 2, defined by XRY is 5x+6y is divisible by 11 for x,y,∈R show that R is an equivalence relation on Z.
4. Let A= {1,2,3,4} and R={<1,2>,<2,3>,<3,4>} find R* transitive closure and draw its graph.
5. For set A={1,2,3,4,5} the Relation matrix is

$$\begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 \end{pmatrix}$$ Draw it diagraph.

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

1. Let A={1,2,3,4,12} Let R be a partial order relation defined on A as a Rb if and only if a/b (a divides b) Draw the hasse diagram of partial order relation R.
2. Find first six terms of the sequence defined by the following recurrence relation $a_n = a_{n-1} + 3\ a_{n-2}$ with $a_0 = 1$ $a_1 = 2$
3. Consider recurrence relation a_n=a_n-1+3 a_n-2 with ag=2y,a_{10} = 12 find 92
4. Find the adjancy matrix of following graph.



5. Draw the graph represented by adjancy matrix.

	V1	V2	V3	V4
V1	0	2	1	1
V2	2	0	2	1
V3	1	2	1	0
V4	1	1	0	1

6. Define the following graph with example
   i) connected graph ii) Complete graph

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