Mahiem Agrowal Compoter Science 22. Sheet #4. Problem 4.1 A THE BUSINESS VIEW a) For a relation to be partial order () we need to proove that is reflex reflexive, anti sy mmetric and transitive Reflexive If p is just a subset of the word w then p
p = p = p = p. for all values. Example. & w=computer. p=computer also eff or p=p : proved, refliexive

ser tan also be included which in our case is & so, Is among the morney Problem 4.1 Anti - symmetic. (P, w) E Fx, A pq = w 1 w=pq. This can be proven easily as we have said p is a subset of w &whore p=W and there exists an empty set which in our case is q so :. p=w and w=p. Example.

V="Name" p="Name" and q="" in pg = w and w=pe or w=p. .. provea. or p=w or Name = Name Transitive. PLg 1 gEr EE* \$pdr sa # Example, Q= Computer r= Computer System. e, To= Comp @ Comp is a prefix of computer or p is prefix of q.

9	
9	
3	
9 0	Again
9.	"Computer" is prefix of Computer Notwork.
9 9	: q is a prefix of r.
N 3	
W 3	:. p is also a prefix of r.
N 3	· · · proved Transitive
0 0	
00	
100 1.	It is a partial oraer
	F1 13 9 P0171011 01 UET
b)	
	proper pretix of w such that
6 3	p + w
6 3	1 Mall & Hall as
	pdp => Ew # p =p for all values
6 3	This during Artypopelist
6 3	Example
6 3	p= Compot
6 9 0	aw=compoter
63	
	$p \neq \omega$
	or p+p
	The state of the s
	!. irrefliuve. proved.
69	
	() we know (p, v) E + r as well as (p, v) + r
	so any combination of p and w will either be
	strict partial order or partial order
	(P, w) E & r V (P, w) E & :. It is total.

A-symmetric (p,w) & Et; & ptw pgtw 1 wfpg we have defined Pas a proper subset so P cannot be equal tow aut even when se include empty set to Q. Example. W= 60 Hello and q=p p=Hell. Patw Hell & Hello ... It is abtin A-symmetre.

TransHio. ptg ngtrGE*, aptrso. P="N" and q="Na" and 1="Name" 'N'is a subset of "Na" so PCG PRIMARY. "Na" is a subset of "Name" Q C R .. PCR and ptr i prove a. Theretore as it is N-symmetric, ineflive irreflerive and Transitive it is strict partial order. Problem 4.2 11-15 bijective inicotive f: A-DB an q:B-)C, a) got is bijective then f should be injective and g should be surjective. let aEA, bEB and cEC There exists of f(a))=c

There exists a CA with g (f(a)) = C Then if we take be fla) EB, g(b) =c As & CEC is an image of g. C must be mapped by a tleast one of the Ideaponant g is surjective Consider me William . To the state of the st g f-(A) f (a) = A f(b)=B and as we know gf got is bijective all domain of a should match to A for it to be bijective. :. All dompin of # a match to A thenotore IL is bijective injective. b) Injective Sociective

Here, and the same aleige, print Ros f: A -> B is injective as every eloment of x a value of y comes, Agt: B -> C is surjective os every elementin codomain & is mappea to one element or 13 However it is not bijective as eway codomain y is not matched ny one domain X look at the alphabet a not soiletitle not injective F.A. B is not sorjectice as every codomoin Bis not mapped by one element INP f: B > C is not injective as every element K do B does not hove a differenty HOWEVER F.A-C is bijective as every element

of A is matched exactly by one elementin C. Run F. A-3 Bishingerhide as every changed of X andle Of y conner Aid LIB Se 12 200, 604 COZ every elementin codoman & is make to converte or all. Floweder it is not bijective as every codemann y is not requenced. by Ane domain X, looke of the application as not soil difference not injective is not son ectic os evely A +: A -:] 13 is not marged by one element Cadopiopi AIN! per 11-26 The note injecting says appear theren र या है वेटल जा राज्य है है विनिधार है Colored to the second to the second Trial (CO)