MDL Assignment - 1 NAGA MANOHAR x- Fake gust T 202/10/128 100767 V- False (a) The state is wrong as their could be situation - Raju is carrying an umbrella, but it didn't rain (since it's a sunny-day) using truth Tables & Majorina let p- the event of Raju carrying an Now statement 1 is P-160 and

If both statements together are valid p has to be true

p has to be true

p has to be true =) $P \rightarrow Q$, $Q \Rightarrow P \rightarrow Q$ from O_1Q then chapt Truth Tables P-10,0-13 then the reshould P-70 1 p - is raise no case when TT T F T |2 |2 : The statement S=True
isn't valid T=false 7/-0 Thus, the 2 statements can't be valid simul faneously

(a) Thus, it statement 1 is true, then Statement 2 need NOT be trail. p - the event of weather is warm Q- be the event of sky is clear R- he the event of we go swimming S- be the event of we go boating

Still It the weather is warm and the sky is clear, then either we go swimming or we go booting

boating. i-en

(PAP) -> (RVS) - 0

stz-It is not the case that it we do not go swimming, - Then the sky is not clear item ~(~R-)~Q) -0 st3: Therefore, either the weather is warm? or we go boating ien ((13/67) 7 = (PVB) -(3) Now for the stristrists to be true (VAX) Simultaneously. (100) (100) 010 =) 3 (T+7) (-(T)= Thus () =) (PAQ) -> (XVY) TET = =) ~ (PAQ) ~ (XVY) =) (NPV~Q) ~ (XVY) Stain wente ind (DNNA)~ (= =) NRAQ huy in truth table to the On Bare true we should jet ther 3 must be true R- 10e the event 1 Stijsb2 - cre premise (1,2) stijste on chusida on mou zi vert now ent to stite boating. i-en

stz st3 (conclusion) PQRS TTTT THANKS LOWS LOWDS. TTFT AC9 (79-97, Doce 9 TTFF TFTT F Conine (prine) 7 てド アド @ NQ JR (NEMISE 2) TFFT TERRIFIED LOST WHOME (COM) REG (COM) FT THE TOTAL TOTAL STATE OF THE ETFF T FIRST THE DOOR DUF SOMMOTO WE ARRANGED TO FE TO THE PROPERTY OF THE PROPERTY O FFFF TOFF = St. (7,7) V (Desput st3 (7) 1501, P=F-Q=TZYD=ACA Hence, O, D & Swall of a Thus str, stratements together are invalid.

Hence, the statements together derive a contradiction

2 SAGDIAM A DAM x-False T-True y-False F-False airen, A true B-true Situation of the contents of whomeld (usb - 241 aniz = Front False) of the (b) AV (XAY) = TV(FAF) (-VFAF) MEU TO BRIGHT FOR FOR THE THE THE (c) AN (XN (BNY) = TN (FN (TNF))))

(d) AN (XN (BNY) = TNF (FNF))

(e) AN (XN (BNY) = TNF (FNF))

(f) AN (XN (BNY) = TNF (FNF))

(e) AN (XN (BNY) = TNF (FNF))

(f) AN (XN (BNY) = TNF)

(f) AN (XN (BNY) = woh biler no restagis Fatfalse) d)((ANX) V NB) N ~ ((ANX) NNB) = ((TAF) VF) N N ((TAF) VF) of 2019 4 (= p, DC4 (= = (FVF) AN (FVF) = FANT FAT/ 21- 2000 95-9 9 9 = IE (False) 21 = q The statement s-Tru

(e) (pha) A (ANX) PIF is not the case = (PNQ) N (JUTUF) vise suit assit grimmias o $= (P \wedge Q) \wedge (F \wedge F)$ $= (P \wedge Q) \wedge (P \wedge F)$ we go boating isen = F (False) (E)- (8/4) (4) $((\times \wedge \vee) \rightarrow A) \rightarrow (\times \rightarrow (\vee \rightarrow A))$ = $(F \rightarrow \top) \rightarrow (F \rightarrow (F \rightarrow \top)) \downarrow P \mid Q \mid P \rightarrow Q \mid P \rightarrow$ FITTE = (T) -> (F-) (PVX) = 10/0T (0) (xxx) 6 (pxq) ~ (e = T-) T = T (True) (VVX) V (O)

3(a) Formal Proof Mothod's アーコック、マヤーアー)アーノ東 TTT OP-)~Q (Premise) @ 20-) R (Prémise 2) 3 P-)R (= (1)(2) -) Hypothetical syllogism)
P-10, Q-)R-)P-1K [: P-) ~ Q, ~ Q-) R =) P-) Q is true Resolution Method + Doonvert the premise's and goal to CNF

(conjuction of disjunction)

PANO = NPVNO = -PT PONQ = NPVNQ = -PI NO-) R = NI(NQ) VR = POVR-PI NO-) R = NI(NQ) VR = POVR-PI POR = NPVR DAG 189 Now to prove that p follows from S (S=)p) using refutation,
start with S and ~p in dausal form & derive a contradiction s, vp are and if empty clause devised z) never true together =) some true, at least one clause of p is talse =) ~p is false a) b is true.

~(P) 10 ~ (P-)R)=~(aprR) mussoler 0 N(3) Price PAR (Premise) DV(9P)) R. a. NPVNQ Hences apvad, QVR = 2 PORT to some house there clause to merce derived there clause to merce derived the sound to the clause to merce derived the sound to the clause to merce derived the contract of the clause to merce derived the contract of the enerous ((prop) /) -) Q (Emphy clause)
= ((prop) ((prop) -) Q $= (6 \text{ wb}) \cdot (6 \text{ wb}) \rightarrow 0$ $= (6 \text{ wb}) \cdot (6 \text{ wb}) \rightarrow 0$ $= (6 \text{ wb}) \cdot (6 \text{ wb}) \rightarrow 0$ $= (6 \text{ wb}) \cdot (6 \text{ wb}) \rightarrow 0$

A JE = 2 (QANP) VQ Mysella (M (-9) W. (Dr 800 2 (~ Q V ~ (~P)) ~ Q (premise) =(~QVP)~Q parguage (menise) = (QVNQ)YP SUD JO = TVP 10 Nothogen mode = T (Trul)

= R.H.S (Nothologen mode)

Formal Proof Nacithod's (1) for regalities of 9.8 Cy. 10 P. conduston (R.H-s) tom the above observations Co Employ clouse is always true (Tautology) 12 true das =) ((pvQ) A~p) -) Q 35/26 51 day and valled Avga (Avg Herreis apport Resolution methods 3000 again (S=) p consider NP and prove resolution of s, vp empty clouse 3 8.4.5 = ((PVQ) N DP) (DV)) (PVQ) 10 (10/0) -10/0

 $= ((PVQ) \wedge (PVQ)) = ($ (AMB=NANB) = ~ (~(pvq),~p)) vq) (NPVQ) NP)) (PP) = ((PVQ) N~P (Q) =) cloursal formst 9. pv9 from regation of condusion (RItes) (2. NP) 1 (C153 Resblukon) Cs. Empry clause (Cz, Ly Resolution) 2. S-J-VP =) empty clause (resolution) 7) S=) P 15 mil =) ((pvp) 1 -) Q is true Hank, proved