OIL:

UUP & NP

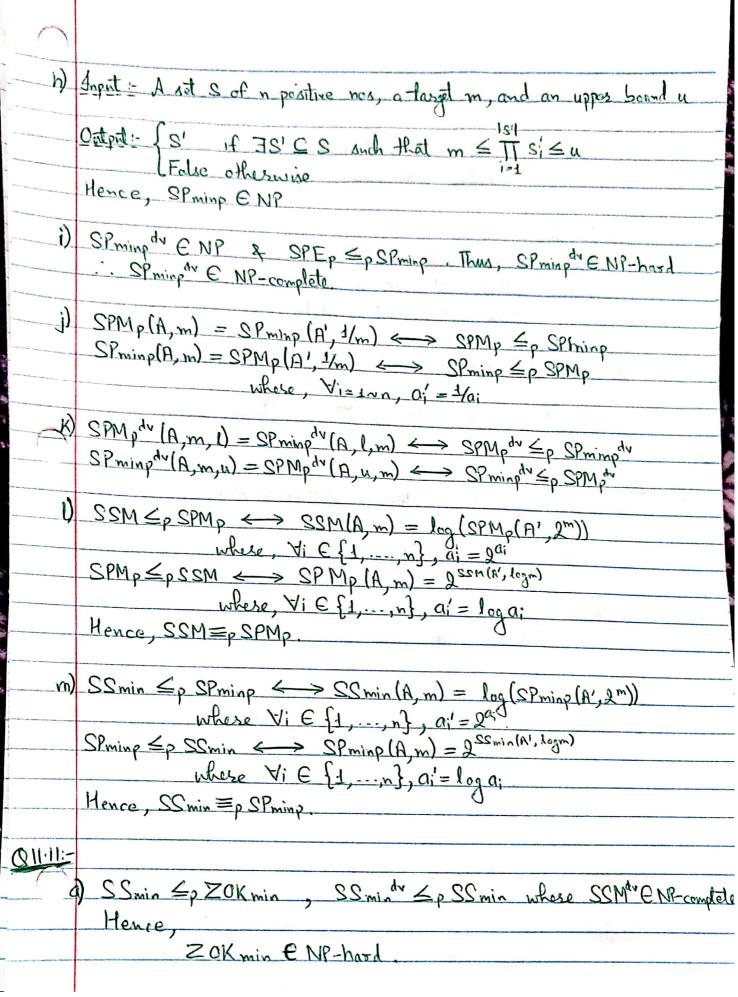
AVLC ENP

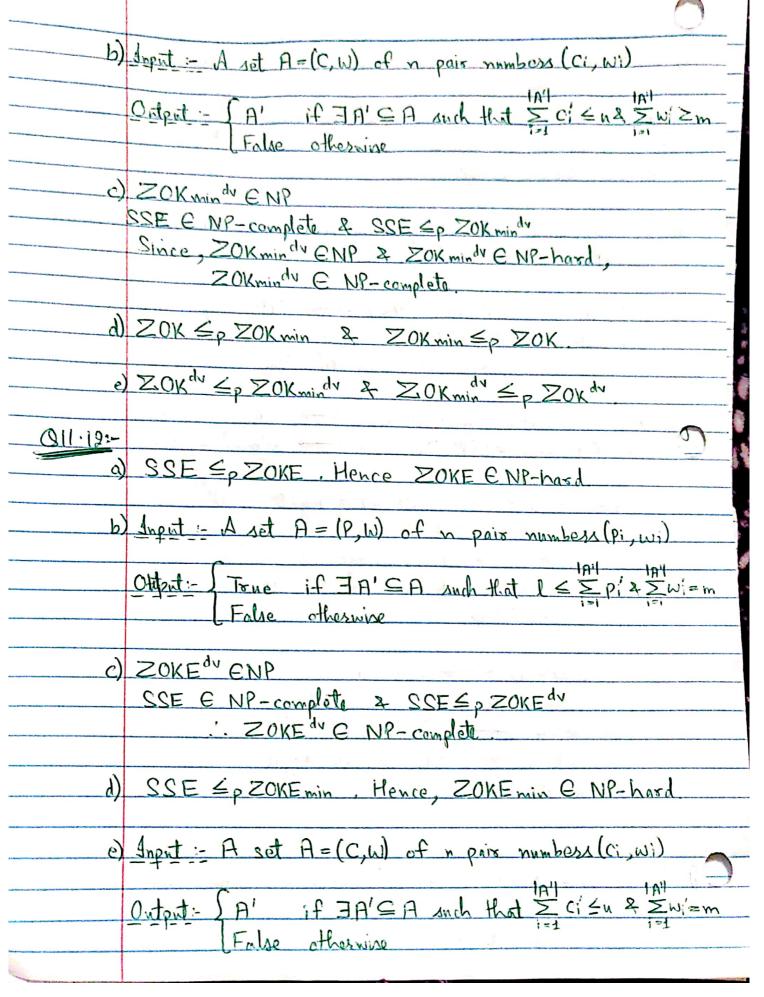
e CVH ENP

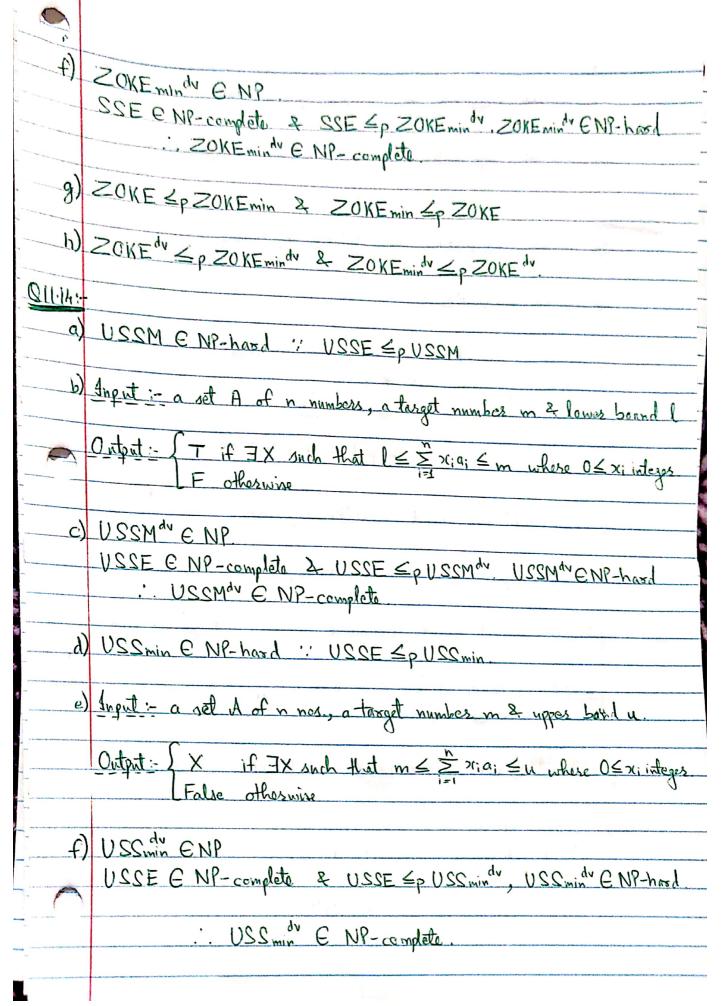
011.3

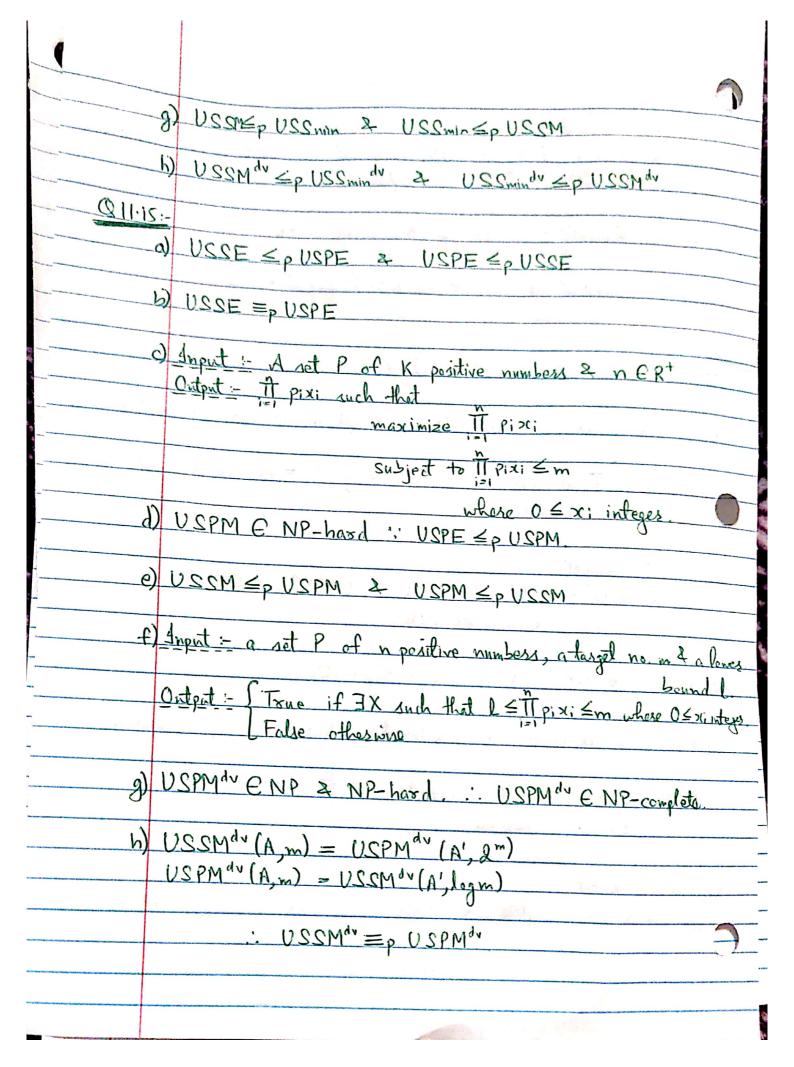
a) Yes, 
$$(xV-yVz)\Lambda(xVyV-z)\Lambda(-xV-yV-z)$$
 is satisfiable when  $(x=T)$ ,  $(y=T)$  and  $(z=F)$   
 $(TVFVF)\Lambda(TVTVT)\Lambda(FVFVT) \equiv T$ 

| Q11.10:-  |   |
|-----------|---|
| a)        | A proported answer for the SPEP can be verified in polanomial time along  |
|           | in polynomial time (1(151)).  Hence, SPEPENP  |
| 6)        | SSE SOCO CON CONTRACTOR   |
|           | SSE $\leq \rho$ SPE $\rho \iff$ SSE(M, m) = log(SPE $\rho$ (A', 2m))<br>where, $\forall i \in \{1,, n\}, o'_i = 2^{\alpha_i}$ |
|           | SPEP < SSE (A) SPEP(A, m) = 2 SCE(A', logm)   |
|           | Hence, SCE = SPEp.  |
|           | Since SPEP ENP and SPEPE NP-hard by SSE < PSPEP, SPEPE NP-complete.   |
|           | $SPEp \leq p SPMp \iff SPEp(A,m) = \begin{cases} S = SPMp(A,m) & \text{if } II \times m \end{cases}$                          |
| 1.00      | no otherwise  |
| <u>e)</u> | Input: - Ast S of a positive numbers, a target m and a lower bound!   |
|           | Output: True and for S' if $\exists S' \subseteq S$ such that $l \leq \prod s' \leq m$ [False otherwise                       |
| t)        | SPMpdv ENP  |
|           | SPEp <p (a,="" m)="SPMpdv" m)<="" m,="" spmpdv="" th=""></p>  |
|           | Since, SPMpdv ENP and SPMpdv ENP-hard, SPMpdv ENP-  |
| g)        | SPEP SPMinp SPEP(A,m) = S=SPminp(A,m) if IT x=m (no otherwise,  |
|           | LIC BYVENWAU,   |

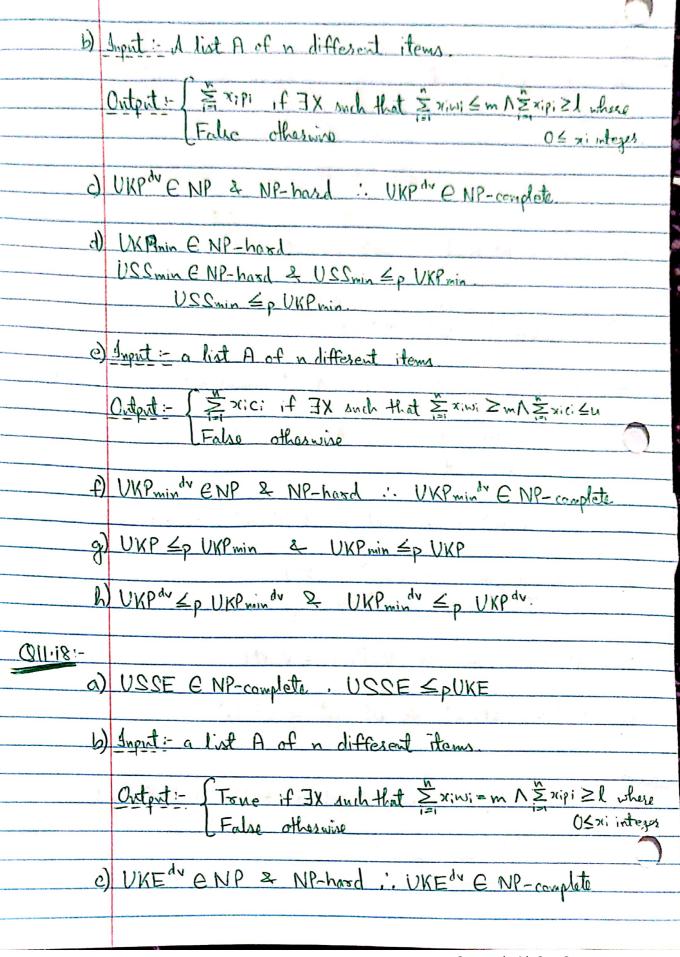








Q11.16: a) Input: - A set P of K positive numbers & n E R+ Output - IT pixi such that minimize Ti Pixi subject to \$ pixi ≥m where 0 \le x; integer. b) USPmin & NP-based : USPE < p USPmin c) USSmin(A,m) = log USPmin(A', 2m) USPmin(A,m) = QUSSmin(A; logm) d) Input: - a set P of n tre nos, a target number mit an upper bound! Output: I'm pix: if IX such that m & Tipixi & where O & xi integer False otherwise e) USP minds ENP & NP-hard ... USP minds ENP-complete f) USSmind (A, m) = USPmind (A', 2m) (mgol, 'A) vanim 22 U = (m, A) vanim 22 U a) USPM & PUSPmin & USPmin & USPM VbM92U = Vbmin92U & Vbmin92U q = VbM92U (A Q11-17: a) UKP ENP-hard : USSM = PUKP & USSM ENP-hard USSM & PUKP.



d)  $USSE(\hat{H},m) = \begin{cases} T & \text{if } UKEmin(IA,A), n,m) = m \\ F & \text{otherwise} \end{cases}$   $\hookrightarrow USSE \leq pUKEmin$ e) Inpit: a list A of n items. Output: True if IX such that \( \sum\_{\text{ini}} \text{xini} = m \) \( \sum\_{\text{ini}} \sum\_{\text{ False otherwise f) UKEmind ENP & NP-hard, ... UKEmind ENP-complete 9) UKE UKE min > UKEmin h) UKE dv & UKEmin dv & UKEmin dv & UKE dv