

QUIZ 3 - SOLUTIONS (YELLOW VERSION)

1. Set Cover (MC)

- A. 3 C. 2
B. 2 D. √

2. MAX CUT

(i) UNIQUE MAX CUT $C = \{1, 4\}, \{2, 3, 5\}$
 $|C| = 5$

(ii) $1/16$ (iii) $1/4$ 4 cuts of size < 3 .

3. BIN PACKING

(i) 3 bins : $\begin{bmatrix} 2 \\ 8 \end{bmatrix} \begin{bmatrix} 3 \\ 7 \end{bmatrix} \begin{bmatrix} 5 \\ 4 \end{bmatrix} = \text{OPT}(I)$

(ii) 4 bins : $\begin{bmatrix} 1 \\ 2 \end{bmatrix} \begin{bmatrix} 3 \\ 4 \end{bmatrix} \begin{bmatrix} 7 \\ 8 \end{bmatrix}$

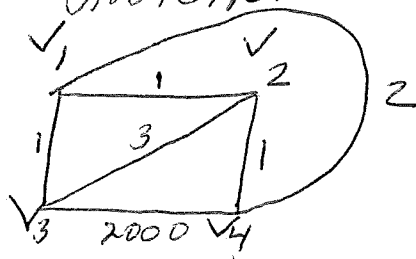
(iii) ~~3~~ bins : $\begin{bmatrix} 2 \\ 8 \end{bmatrix} \begin{bmatrix} 3 \\ 7 \end{bmatrix} \begin{bmatrix} 4 \\ 5 \end{bmatrix}$

(iv) 5 bins : $\begin{bmatrix} 5 \\ 2 \end{bmatrix} \begin{bmatrix} 4 \\ 7 \end{bmatrix} \begin{bmatrix} 1 \\ 8 \end{bmatrix}$

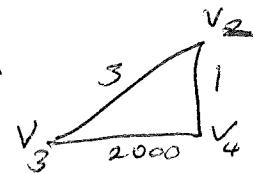
(v) $5/3$ ratio.

4. TSP Problem.

(i) $G =$



(ii) Δ



is not Euclidean

(iii) OPT is TSP CYCLE IS 2 4 1 3 2 of cost 7
"OPT

APPROX ALG GIVES:

MINST = $\begin{bmatrix} 1 \\ 1 \end{bmatrix} \begin{bmatrix} 2 \\ 4 \end{bmatrix}$, GOING AROUND TSP IN
ORDER 3 1 2 4 3 has cost $2003 > 5 \cdot 7$.