MATH 354 Quiz 4 - October 4 Fall 2017

Name _____

No aids allowed. Answer all questions on test paper. Use backs of sheets if necessary.

Consider the Job Scheduling algorithm:

1: Sort the jobs in non-increasing order of profits: $g_1 \geq g_2 \geq \ldots \geq g_n$
2: $d \longleftarrow \max_i d_i$
3: **for** $t : 1..d$ **do**
4: $\quad S(t) \longleftarrow 0$
5: **end for**
6: **for** $i : 1..n$ **do**
7: $\quad$ Find the largest t such that $S(t) = 0$ and $t \leq d_i$, $S(t) \longleftarrow i$
8: **end for**

Consider the following input

$$\{\underbrace{(1,10)}_{1}, \underbrace{(1,10)}_{2}, \underbrace{(2,8)}_{3}, \underbrace{(2,8)}_{4}, \underbrace{(4,6)}_{5}, \underbrace{(4,6)}_{6}, \underbrace{(4,6)}_{7}, \underbrace{(4,6)}_{8}\},$$

where the jobs have been numbered underneath for convenience. Trace the workings of algorithm on this input. On the left place the job numbers in the appropriate slots; on the right, show how the optimal solution is adjusted to keep the "promising" property. Start in the following configuration:

$S^0 =$ | 0 | 0 | 0 | 0 | and $S^0_{\text{opt}} =$ | 2 | 4 | 5 | 8 |