MTL 783 (Theory of Computing), Part 2, Quiz 2

Instructions:

- This quiz will be worth 10 points and time given will be 45 minutes.
- Please make your arguments clear and concise. Unclear or unnecessarily long answers might attract negative marks.
- You do NOT need to write the questions on your answer-sheets. Please follow the instructions sent in the email previously.
- You can use any lemmas/theorems/intermediate results done in the class, but please clearly state them if you do.

Question 1: In the Equal Post Correspondence Problem (EPCP), the top string in each pair has the same length as the bottom string. Show that the EPCP is decidable. [3 points]

Question 2: Let $T = \{\langle M \rangle \mid M \text{ is a TM that accepts } w^{\mathcal{R}} \text{ whenever it accepts } w\}$ (here $w^{\mathcal{R}}$ denotes reverse of the string w). Show that T is undecidable. [3 points]

Question 3: Let $X = \{\langle M, w \rangle \mid M \text{ is a single-tape TM that never modifies the portion of the tape that contains the input } w\}$. Is X decidable? Justify your answer. [4 points]