

1. Which of the following is false ?

- (a) If the feasible region is bounded, there is always a maximum solution.
- (b) It is possible for a standard maximization problem to have no solution.
- (c) A standard minimization problem can be solved by solving a dual problem.
- (d) A linear programming problem can have infinitely many solutions.
- (e) None of these.

Solution :

- (a) If the feasible region is bounded, there is always a maximum solution.
False. The empty set is a feasible region, is bounded, but there is no maximum value inside it. See also page 191 of the book, **Theorem 2, c.**
- (b) It is possible for a standard maximization problem to have no solution.
True. See page 236 in the book, when it may be the case.
- (c) A standard minimization problem can be solved by solving a dual problem.
True. It was specified in the class.
- (d) A linear programming problem can have infinitely many solutions.
True. See page 191 in the book, **The method of the corners, 4.**
- (e) None of these.
This is not necessary, because we found that (a) is **False.**

The correct answer is (a).

2. Which of the following is true?

- (a) A standard maximization problem always has solution.
- (b) A maximum always exists on an unbounded region.
- (c) A pivot column is chosen before the pivot row in the simplex method.
- (d) To choose a pivot element, ratios of the last row and the pivot row are found and the smallest chosen.
- (e) The dual problem for a standard minimization problem is a standard minimization problem.

Solution :

- (a) A standard maximization problem always has solution.
False. See page 236 in the book, when it may be the case that we have no solution.
- (b) A maximum always exists on an unbounded region.
False. On contrary, no maximum exists on an unbounded region.

- (c) A pivot column is chosen before the pivot row in the simplex method.
True. That's how we proceed in the simplex method.
- (d) To choose a pivot element, ratios of the last row and the pivot row are found and the smallest chosen.
False. No, ratios of the last **column** and the pivot **column** are found and the smallest chosen.
- (e) The dual problem for a standard minimization problem is a standard minimization problem.
False. It is a maximization problem.

The correct answer is (c).