

Example 36. A firm uses three machines in the manufacture of three products. Each unit of product *A* requires 3 hours on machine I, 2 hours on machine II and one hour on machine III. Each unit of product *B* requires 4 hours on machine I, one hour on machine II and 3 hours on machine III, while each unit of product *C* requires 2 hours on each of the three machines. The contribution margin of the three product is ₹ 30, ₹ 40 and ₹ 35 per unit respectively. The machine hours available on the three machines are 90, 54 and 93 respectively.

- (i) Formulate the above as a linear programming problem and solve for maximum profit, using simplex method.
- (ii) Write the dual to the LPP.
- (iii) Obtain the optimum values of the dual variables and verify that the primal and the dual problems have the same objective function values. [Delhi Univ. B.Com. (H) 1995]

Solution. (i) Let x_1 and x_2 be the number of units of product A and B respectively.