

THE OPEN UNIVERSITY OF SRI LANKA

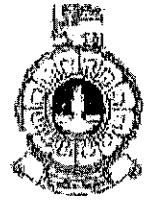
B.Sc. /B.Ed. Degree Programme

APPLIED MATHEMATICS-LEVEL 05

ADU5300- Linear Programming

OPEN BOOK TEST 2017/2018

**Duration: One Hour.**



**Date: 30.06.2018**

**Time: 10.30 a.m- 11.30 a.m**

**Answer all questions.**

(1) An airline offers economy and business class tickets. For the airline to be profitable, it must sell a minimum of 25 business class tickets and a minimum of 40 economy class tickets. The company makes a profit of Rs.225 for each economy class ticket and Rs.200 for each business class ticket. At most, the plane has a capacity of 150 travelers.

- (i) Define the decision variables for the problem.
- (ii) Write the objective function.
- (iii) State the constraints in order to maximize the profit.
- (iv) Solve the formulated problem using the graphical method.

(2) Solve the following linear programming problem using Simplex method:

$$\text{Maximize } z = 3x_1 + 2x_2 + 5x_3$$

$$\text{Subject to } x_1 + x_2 + x_3 \leq 9,$$

$$2x_1 + 3x_2 + 5x_3 \leq 30,$$

$$2x_1 - x_2 - x_3 \leq 8,$$

$$x_1, x_2, x_3 \geq 0.$$

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