

22/3/2018



Doon University, Dehradun  
Mid Term Examination, 2018  
School of Social Science  
M.Sc. Integrated Economics, Semester-8th  
Course Code - SSEI-523  
Operation Research

Time Allowed : 2hrs

Maximum Marks :30

**Section - A**

Attempt **all** questions

Marks:2x3=6

- Q.1 Define the following terms :-  
(a) Slack Variables  
(b) Surplus Variables  
(c) Basic Variables

**Section - B**

Attempt **any two** questions.

Marks:2x6=12

- Q.2 Write a short note on the different phases of Operation Research.
- Q.3 Use graphical method to solve the following linear programming problem (LPP):  
Max.  $Z=3x_1 + 5x_2$   
s.t.  $x_1 + 2x_2 \leq 2000$   
 $x_1 + x_2 \leq 1500$   
 $x_1 \leq 600$   
 $x_1, x_2 \geq 0$
- Q.4 Give some characteristics of linear programming problem. Also rewrite the following linear programming problem (LPP) in the standard form:  
Max.  $Z=3x_1 + 4x_2 + 2x_3$   
s.t.  $4x_1 + 2x_2 + 3x_3 \leq 6000$   
 $2x_1 + 4x_2 + 5x_3 \geq 10000$   
 $5x_1 + 2x_2 + x_3 = 5000$   
 $x_1, x_2, x_3 \geq 0$

**Section - C**

Attempt **any one** question

Marks:1x12=12

- Q.5 Define Operation Research (OR). Discuss the different models available in OR.
- Q.6 Use simplex method to solve the following linear programming problem (LPP):  
Max.  $Z=4x_1 + 6x_2$   
s.t.  $x_1 + 3x_2 \leq 240$   
 $3x_1 + 4x_2 \leq 370$   
 $2x_1 + x_2 \leq 180$   
 $x_1, x_2 \geq 0$