# Gurudas College <br> STATISTICS [General] <br> Semester-V, Paper-DSE-A <br> Internal Assessment Exam, 2021-22 

## Attempt any 10 of the following questions

1. (a) Define basic solution of a system of $m$ linearly independent equations with $n$ unknowns ( $n>m$ )
(b) Which of the following statement is correct?
(a) If a LPP gives two optimal solutions it has infinite number of solution.
(b) Every LPP admits an optimal solution.
(c) Every LPP admits unique optimal solution.
(d) None of these.
(c) Write the initial system of equations for the linear programming models

Maximize $P=-9 x_{1}+0.5 x_{2}$
Subject to: $2 x_{1}+4.5 x_{2} \leq 85,4 x_{1}+3 x_{2} \leq 70$
$x_{1} \geq 0, x_{2} \geq 0$
(d) Write the initial simplex tableau for

Maximize $P=5 x_{1}-3 x_{2}+2 x_{3}$
Subject to: $6 x_{1}+8 x_{2}+x_{3} \leq 100$
$4 x_{1}+3 x_{2}-2 x_{3} \leq 90$
$x_{1}, x_{2}, x_{3} \geq 0$
(e) Convert the inequalities to an equation using surplus variables.
$3 x_{1}+2 x_{2} \geq 60$
(f) Give an example of LPP where variable is unrestricted in sign.
(g) Write the initial system of equations for the linear programming models

Maximize $P=2 x_{1}+6 x_{2}$
Subject to: $6 x_{1}+8 x_{2} \leq 85$
$4 x_{1}+3 x_{2} \leq 70$
$x_{1}, x_{2} \geq 0$
(h) Write down the assumptions of linear programing problems.
(i) How can you convert a maximization problem to a minimization problem?
(j) TRUE/FALSE : If an optimal solution exists, then an optimal extreme point exists.
(k) What do you mean by cost vector?
(l) Is the feasible region of the graph of the following LPP bounded?

Minimize $2000 x_{1}+1500 x_{2}$
Subject to: $6 x_{1}+2 x_{2} \geq 8$
$2 x_{1}+4 x_{2} \geq 12$
$x_{1}, x_{2} \geq 0$
(m) Write down the components of linear programming problem.
(n) $4 x_{1}+2 x_{2}-3 x_{3}=1$
$-6 x_{1}-4 x_{2}+5 x_{3}=-1$
Is $x_{1}=2, x_{2}=1$ and $x_{3}=3$ a feasible solution of the set of equations or not? Give reason with proper justifications.
(o) TRUE/FALSE : In Linear programming the objective function and constraints are linear.

