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Q 1:   Use the "SIMPLEX" method to maximize the given problem.

Maximize: $p = 2x + 5y$

Subject to:

$2x + y <= 5$

$x + 2y <= 4$

$x >= 0, \quad y >= 0$ [10 marks]

C

1 use simplex method

$P = 2x + 5y$

Subject to:

$2x + y \leq 5$

$x + 2y \leq 4$

$x, y \geq 0$

step 1 slack variable

$2x + y + s = 5$

$x + 2y + t = 4$

step 2 $P = 2x + 5y$

$-2x - 5y + P = 0$

step 1 - spel 4

	x	y	s	t	P	
S	2	1	1	0	0	5
t	1	2	0	1	0	4
P	-2	-5	0	0	1	0

Step 5-6

	x	y	s	t	P	
S	2	1	1	0	0	5
t	1	2	0	1	0	4
P	-2	-5	0	0	1	0

Step 7

	x	y	s	t	P	
S	2	1	1	0	0	5
t	1/2	1	0	1/2	0	2
P	-2	-5	0	0	1	0

$R_1 = R_1 - R_2$

	x	y	s	t	P	
s	3/2	0	1	-1/2	0	3
t	1/2	1	0	1/2	0	2
P	-2	-5	0	0	1	0

$R_3 = R_3 + 5R_2$

	x	y	s	t	P	
s	3/2	0	1	-1/2	0	3
t	1/2	1	0	1/2	0	2
P	1/2	0	0	5/2	1	10

8 Step 8 = No valu is negative a last side

Step 9

S = 3
P = 10
t = 2
y = 0

Ans

Q: 2   Write the characteristics of operations research in your own words.
Copying from notes/internet/book will be plagiarized and will lead to 0 marks.

[10 marks]

Ans: Characteristics of Operation research:

A) Systems Orientation:

It approaches to problems recognizes that the behavior of any part of a system has some effect on the behavior of the system as a whole. Even if the individual components are performing well but the system as a whole is not necessarily performing equally well. This stresses the idea that the interaction between parts of the system is what determines the functioning of the system. No single part of the system can have a bearing effect on the whole.
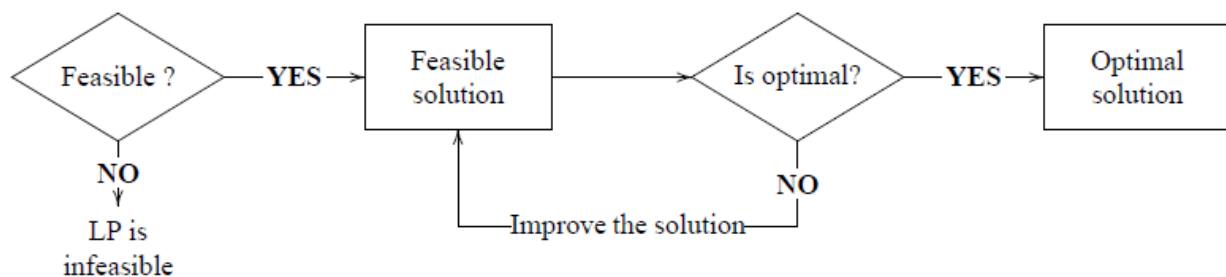
b) Interdisciplinary groups:

The team performing the operational research is drawn from different disciplines. The disciplines could include mathematics, psychology, statistics, physics, economics and engineering. The knowledge of all the people involved aids the research and preparation of the scientific model. The team performing the operational research is drawn from different disciplines. The disciplines could include mathematics, psychology, statistics, physics, economics and engineering. The knowledge of all the people involved aids the research and preparation of the scientific model

c) Methodology:

Operation Research extensively uses scientific means and methods to solve problems. Most Operation Research studies cannot be conducted in laboratories, and the findings cannot be applied to natural environments. Therefore, scientific and mathematical models are used for studies. Simulation of these models is

carried out, and the findings are then studied with respect to the real environment.

Q 3: Explain the given flow chart in your own words.

```
  Feasible ? --YES--> Feasible solution -----------> Is optimal? --YES--> Optimal solution
      |                      ^                            |
      NO                     |                            NO
      |                      |                            |
   LP is               -----Improve the solution----------
  infeasible
```

[10 Marks]

Ans:
1st step:
feasible solution there is a condition for feasibility. If the solution is not feasible. show Linear Program is infeasible. If the solution is correct. Advance to next statement.

2nd step:

Basic feasible solution when the solution is feasible, go to the next condition.

3rd step:

Optimal solution after getting the feasible solution, check the solution whether it is optimal or not. If it is not an optimal solution, go back to 2nd step and improve the solution. If the solution is optimal, move to the final step.

4th step:

The solution is optimal.