Assignment-1

1. A set of jobs U, V, W, X, Y, Z arrive at time t =0 to a production line consisting of two workstations in series. Each Job must be processed by both workstations in sequence (i.e., the first followed by the second). The process times (in minutes) for each job on each workstation in the production line are given below.

JOB	U	V	W	X	Y	Z
Workstation 1	5	7	3	4	6	8
Workstation 2	4	6	6	8	5	7

The sequence in which the jobs must be processed by the production line if the total makespan of production is to be minimized is

(a) W-X-Z-V-Y-U

(b) W-X-V-Z-Y-U

(c) W-U-Z-V-Y-X

(d) U-Y-V-Z-X-W

2.Consider the following linear programming problem with two decision variables x_1 and x_2. There are three constraints involving resoureces R1, R2 and R3 as indicated.

Maximize Z = $6x_1 + 5x_2$

Subject to

$2x_1 + 5x_2 \leq 40$ R1

$2x_1 + x_2 \leq 22$ R2

$x_1 + x_2 \leq 13$ R3

$x_1 \geq 0$, $x_2 \geq 0$

The optimal solution of the problem is : $x_1 = 9$ and $x_2 = 4$.

For which one of the following options, the shadow price of the resource(s) will have non-zero value(s)?

(a) R1, R2 and R3

(b) R1 and R2

(c) R2 and R3

(d) R1 only

Q3. Which one of the options given represents the feasible region of the linear programming model:

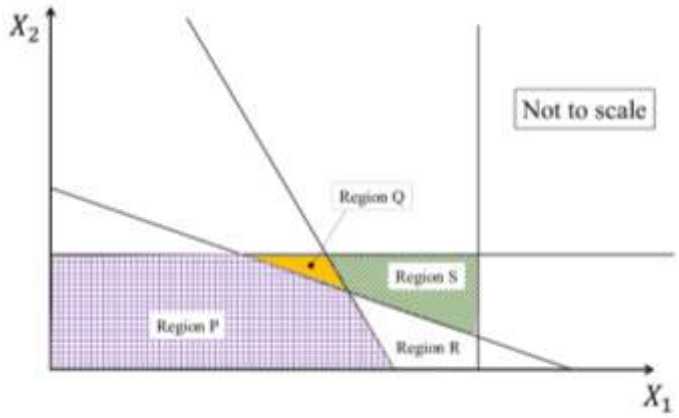
Maximize $45X_1 + 60X_2$

$$X_1 \leq 45$$

$$X_2 \leq 50$$

$$10X_1 + 10X_2 \geq 600$$

$$25X_1 + 5X_2 \leq 750$$



(A) Region P

(B) Region Q

(C) Region R

(D) Region S