INDR 371 HOMEWORK-7

Consider the product mix problem summarized in the table with 3 products (A, B, and C) and 5 types of resources (1,2,3,4,5). There may be multiple workers working in parallel for each resource. Assume that all workers have 8 hours per day. The number of workers in each resource and the times required for each activity (product) in each resource are given in Table 1.

Table 1 process times for sub products

Work stations	Number of workers	Activity time for A (Min/Unit)	Activity time for B (Min/Unit)	Activity time for C (Min/Unit)
1	5	5	5	5
2	4	3	4	5
3	4	15	0	0
4	6	0	4	3
5	8	10	10	10

1) For the given setting answer the following questions:
   a. What is the maximum flow rate if demand must be served in the mix determined by the demand rate (7 units of A, 5 units of B, and 4 units of C)?
   b. What is the bottleneck workstation,
   c. What is the utilization of workstations?
2) Assume that the activity times given in Table 1 are for experienced workers and the time requirements are %50 more for inexperienced workers. Also, assume that our workforce is composed of 12 experienced and 15 inexperienced workers that can be assigned to any workstation. Formulate and solve a linear program (with your favorite mathematical solver) to find the optimal workforce assignment to workstations to maximize the flow rate.