

DMPS – Exerc.	04 February 2020	Prof. S. Terzi – Room BL.27.11
ID Code	Student (Surname – Name)	Personal Code
«ID»	«CognomeNome»	«Codice_persona»

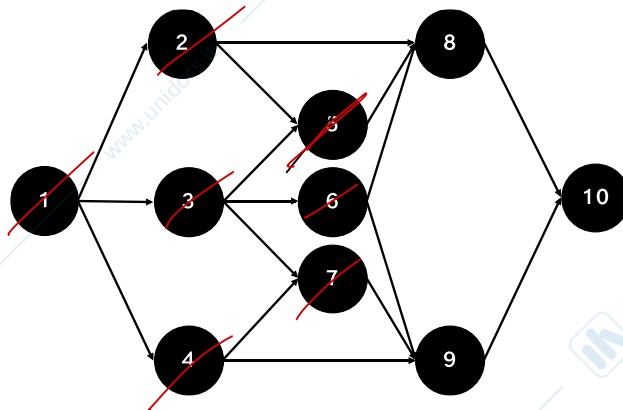
**Exercise 3 - 7 points- ONLY WHAT YOU WRITE IN THE DEDICATED SPACES WILL BE EVALUATED**

A firm is planning to revise the manual assembly line for the production of its main code (assembly graph in figure). The company has built its worldwide recognized reputation on the capability of delivering on time (with on time guaranteed deliveries for 90% of the products) with outstanding quality, striving to keep on leveraging on this factor of competitive advantage, also because of the large profitability of its sales. Considering the duration of the single operations within the process (refer to the Table), and a cycle time of 10 minutes, you are required:

- to design the workstations, allocating each operation in the working station, with the “Maximum incompleteness probability allowed” (PNC) at 10%, using a Station Oriented Approach and the Alphabetical Order as sub-criterion;
- to evaluate then the efficiency of the line.

Could the company adopt other models for designing the assembly line, being coherent with its current reputation?

Operation	Tk [min]	Sk^2 [min^2]
1	5	1.00E+00
2	3	7.00E-01
3	6	1.00E+00
4	5	2.00E+00
5	2	4.00E-01
6	4	4.00E-01
7	3	2.00E-01
8	5	1.50E+00
9	2	3.00E-01
10	2	6.00E-01



$\sigma = 1.9$

CT

**MAXIMUM INCOMPLETION PROBABILITY**

Op.	Workstation	$\Sigma t_i$	Tk	TRk	$s_i^2$	$\Sigma(s_i^2)$	Zk	Pk	PNck	Allocate?	Available Op.
A	1	5	5	5	1	1	5	100%	0%	yes	2,3,4
	2	8	3	2	$7 \times 10^{-1}$	1,7	1,534	99,570	6,3%	yes	3,4
	3	14	6	-4	1	2,7	-2,143		99,25%	no	4
	4	13	5	-3	2	3,7	-1,56		93,94%	no	/
B	3	6	6	4	1	1	4	100%	0%	yes	4,5,6
	4	11	5	-1	2	3	-0,58		71,90%	no	5,6
	5	8	2	2	0,4	1,4	1,69	95,45	4,55	yes	6,
	6	12	4	-2	0,4	1,8	-1,49		93,46	no	/
C	4	5	5	5	2	2	3,54	99,98	2%	yes	6,7
	6	9	4	1	0,4	2,4	0,65	74,54	25,46	no	7
	7	8	3	2	0,4	2,2	1,35	91,15	8,85	yes	
D	6	4	4	6	0,4	0,4	9,4	100%		yes	8,9
	8	9	5	1	1,5	1,9	0,73	76,73%	23,27	no	9

