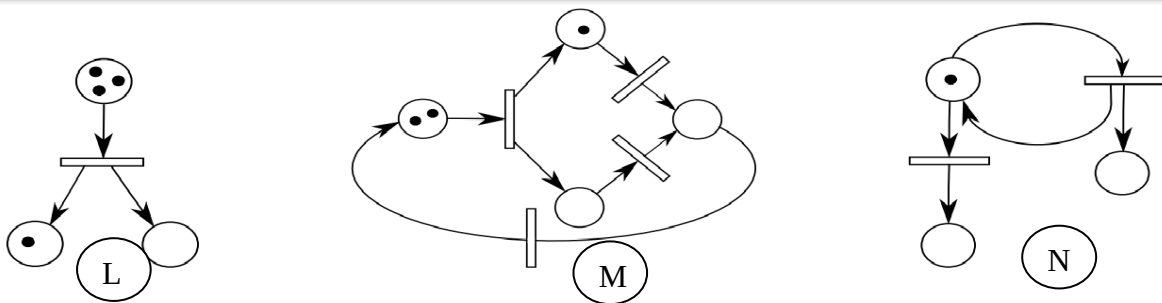
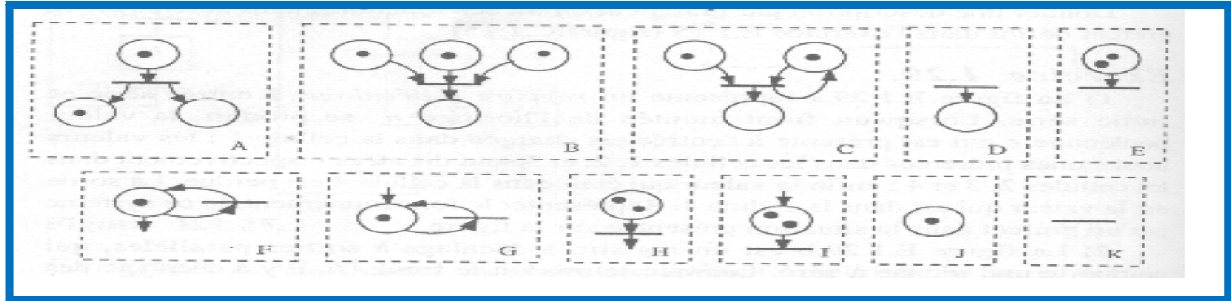


## Tutorial N° 01 : Petri Nets

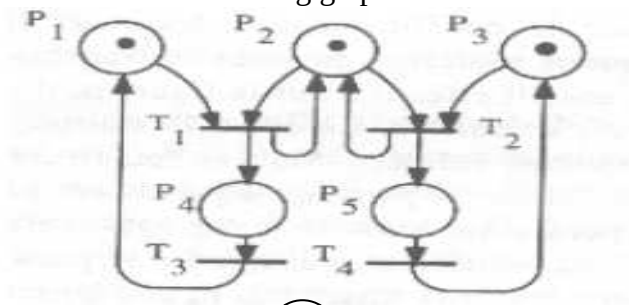
### Exercise 01:



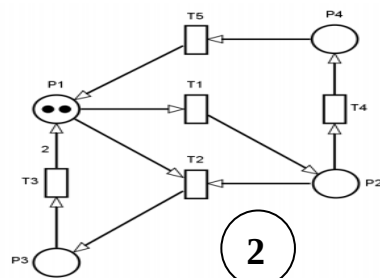
- A. Are the following networks petri nets? If yes, indicate(a....k)
- List all places and transitions.
  - What are the transitions that can be fired (or validate) in this network? Explain why.
  - Give the initial marking of these networks
- B. Give the evolution of the following petri nets and what properties distinguish them?  
(L,M et N)

### Exercise 02 :

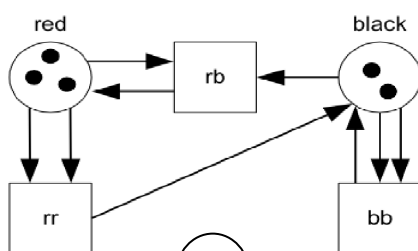
A. Construct the marking graphs associated with the following networks?



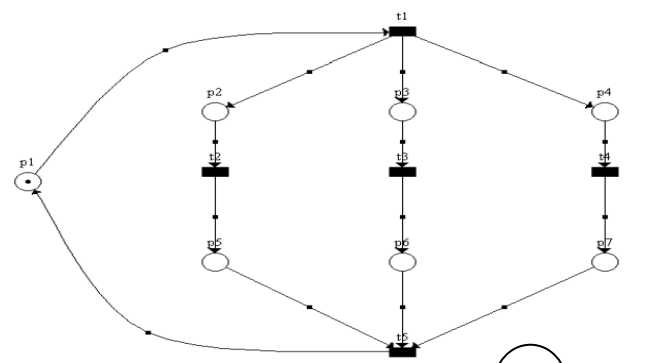
1



2

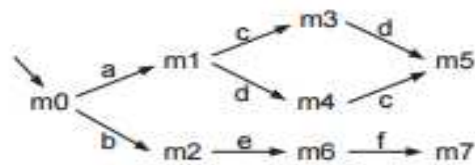
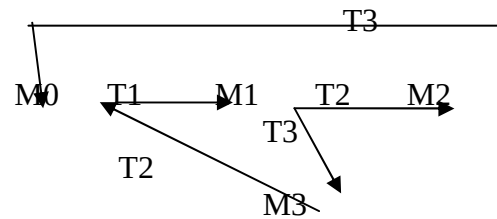


4

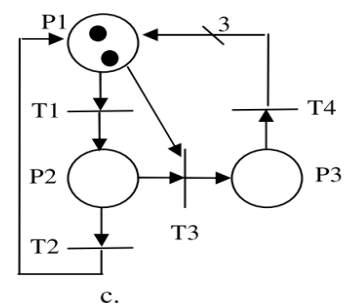
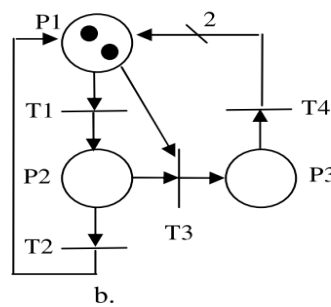
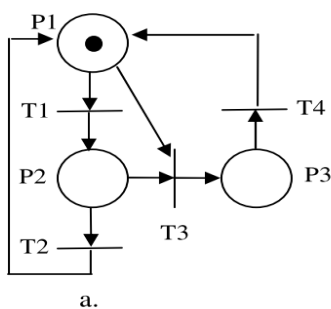
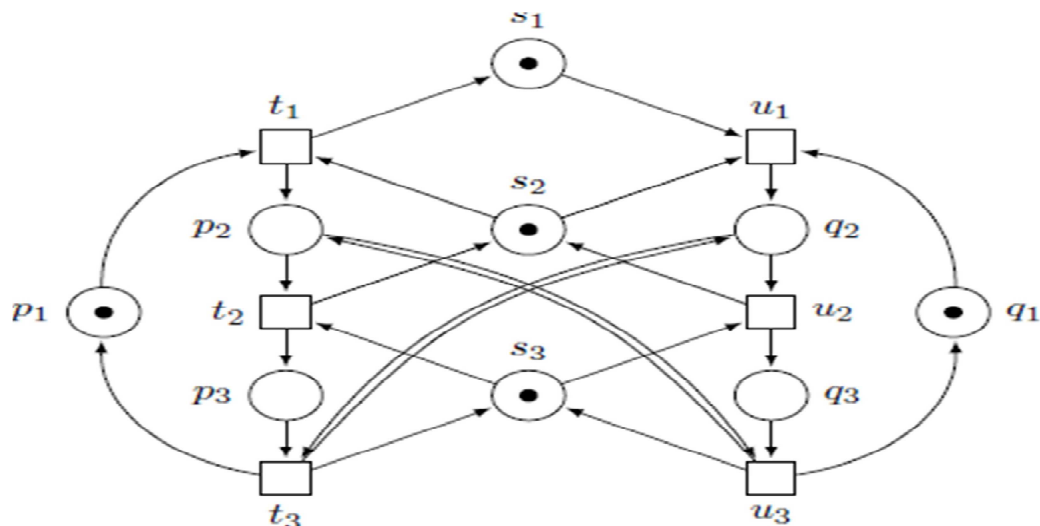


3

B. Construct a Petri net system that has the reachability graph of the following figure: with the marking  $M_0: (1, 0, 1.0)$

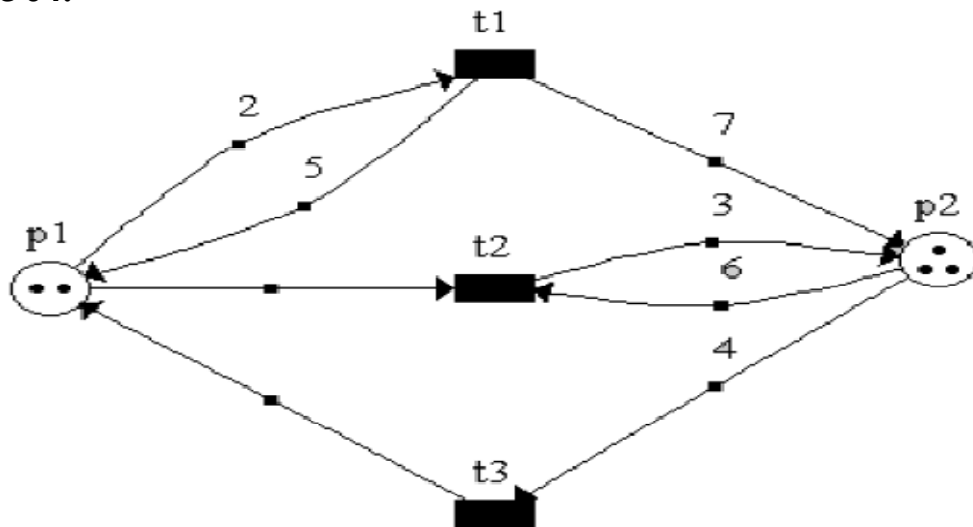


Exercise 03:



- Study the properties of this network?
- Show if this network is: state graph, event graph, with or without conflict, free choice, simple, pure, without loop?
- answer the questions: is it **bounded**? Alive (**Liveness**)? Without blocking? Justify your answer.

**Exercise 04:**



- ✓ Give the incidence matrix of this network?
- ✓ Draw the Petri net with the following matrices:
- ✓ Draw the Petri net after the first change, regarding the final state with only one token remaining. What do you notice?

$$\text{Pré} = \begin{pmatrix} 2 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{pmatrix} \quad \text{Post} = \begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$