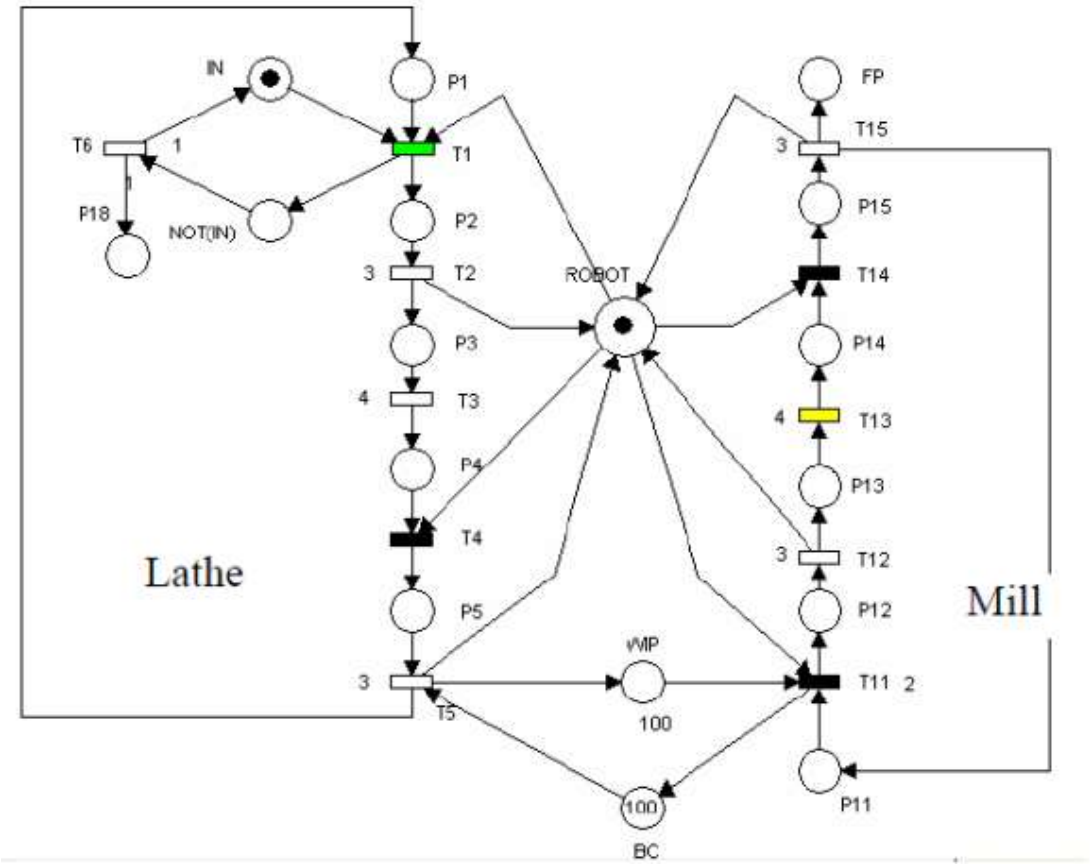
4.4 Homework

A two machine cell is interconnected by a buffer zone. Machines include a lathe (M1) and a Mill (M2). A robot performs parts picking and placing job. The working of the Two-machine robotic cell is shown in the figure below using Petri Net model. The following legend in the following table contains information on places and transitions.

Place	Description	Transition	Description
P1(P11)	Lathe(Mill) ready	T1(T11)	Robot starts loading Lathe(Mill)
P2(P12)	Lathe(Mill) being loaded	T2(T12)	Robot ends loading Lathe(Mill)
P3(P13)	Lathe(Mill) machining	T3(T13)	Lathe(Mill) finishes machining
P4(P14)	Lathe(Mill) wait for unload	T4(T14)	Robot starts unload Lathe(Mill)
P5(P15)	Lathe(Mill) being unloaded	T5(T15)	Robot completes unload
IN (Not(IN))	Part arrived & ready Part waiting at Gate to enter	T6	Part enters System
WIP (BC)	No of Parts in Buffer Maximum Buffer Capacity		
FP	Finished Parts Buffer		
Robot	ROBOT		
P18	Arriving Parts Counter		

Times for various activities are given in the following table.

Transition	Description	Time and Mode
T1	Robot starts loading Lathe	Immediate (Time = 0)
T2	Robot ends loading Lathe	Exponential (Mean = 3)
T3	Lathe finishes machining	Uniform [4 , 6]
T4	Robot starts unload Lathe	Immediate (Time = 0)
T5	Robot completes unload Lathe	Exponential (Mean = 3)
T6	Part enters System	Exponential (Mean = 1)
T11	Robot starts loading Mill	Immediate (Time = 0)
T12	Robot ends loading Mill	Exponential (Mean = 3)
T13	Mill finishes machining	Uniform [4 , 6]
T14	Robot starts unload Mill	Immediate (Time = 0)
T15	Robot completes unload Mill	Exponential (Mean = 3)



a) Using VisObjNet software, build PN model as shown in above figure

b) Make a simulation run for 1000 ms.