FMSE Exercise Course 8: The stochastic process algebra IMC

A small factory consists of two machines and a mechanic. The machines get broken with rate μ resp. λ, and then may be repaired (so the only action of a machine is *repair*). The mechanic may sleep, after which he awakes with rate ν, repairs something, and sleeps again (initially the mechanic sleeps). So when performing the *repair* action the mechanic interacts with one of the two machines.

1. Specify the machines, the mechanic and the composition of the three processes; do not yet hide any actions.

2. Give a derivation of a sequence of actions where one of the machines breaks, and gets repaired.

3. Now hide all actions, and give the resulting transition system.

4. Give a minimal CTMC that is bisimulation equivalent to the transition system in (c). If the transition system still contains non-determinism, i.e. several outgoing tau transitions from a single state, you may assume that these tau transitions all have equal probability.