CS630: Operating System Design

This assignment is due by 11/30 for section 001.
Homework should send to hung@njit.edu
Via email with a subject line read as: CS630/001 HW#07

P₁, P₂ ... P₅ are 5 hosts in a distributed system with ID(Pᵢ) > ID(Pⱼ) if i > j. If Pᵢ and Pⱼ are directly connected, then their communication-latency between them is given as CL(Pᵢ, Pⱼ):

- CL(P₁, P₂) = 4,
- CL(P₁, P₃) = 6,
- CL(P₁, P₄) = 5,
- CL(P₂, P₄) = 7,
- CL(P₂, P₅) = 6,
- CL(P₃, P₅) = 7,
- CL(P₄, P₅) = 4.

If Pᵢ and Pⱼ are not directly connected, then a path with minimum latency will be used. Assume that the system coordinator is the host with the highest ID. If the current coordinator is shut down and then a new coordinator will be elected by the token-ring algorithm. Assume a logic token-ring is set as {P₁ → P₄ → P₅ → P₃ → P₂ → P₁}. If any host is out of service, then a shortest path between the two disconnect token-ring members will be automatically selected. Assume that P₅ sends an initialization message to every host in the system at t=0 and every host starts to send out request to the coordinator every 55 ticks after receiving the message. Assume that the associated communication gears remain intact if its host went down. If the default coordinator will be down at t=300, answer the following questions:

a) When does a host first find out the coordinator go down?

b) Using the Token-ring algorithm to re-elect a new coordinator.