CSE 4501 : Operating Systems **Quiz**
Islamic University of Technology (IUT)
Department of CSE **:4**
Time : 1 Hour
Date: Tuesday, 29 August 2021
Total Marks: 30

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Considering a system with five processes P_0 through P_4 and three resources of type **A**, **B**, **C** with 10, 5 and 7 instances respectively. Suppose at time t_0 following snapshot of the system has been taken:

Processes	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3			
P_1	2	0	0	3	2	2			
P_2	3	0	2	9	0	2	3	3	2
P_3	2	1	1	2	2	2			
P_4	0	0	2	4	3	3			

Based on the above information, answer the following questions.

1. Draw the entire safe sequence detection tree for the snapshot of the system at t_0 and show step-by-step execution of the safety algorithm considering any one of the safe sequences (if multiple exists). Also show the update of related matrices in each step. $10 + 10$

2. What will happen if process P_1 requests one additional instance of resource type **A** and two instances of resource type **C**? If request can be granted, then generate the new snapshot t_1 of the system. Otherwise, consider t_0 as the new snapshot at t_1. 4

3. Based snapshot at t_1, can the following requests be granted? Why? Why not? $3 \times 2 = 6$
   a. Request $(3, 3, 0)$ generated by P_4.
   b. Request $(0, 3, 0)$ generated by P_3.
   c. Request $(0, 0, 2)$ generated by P_2.