GODAWARI COLLEGE

5TH SEMESTER, SIMULATION & MODELING

LAB & ASSIGNMENTS

Lab 1:

1. Draw a system for autonomous aircraft system and explain the diagram. which system does the aircraft systems uses? Please explain your answer
2. Draw a system for college management and show the interactions between sub systems.
3. Name the entities, attributes, activities, events and state variables for the following systems:
   - Cafteria
   - Inventory
   - Banking
   - A hospital emergency room
   - Communication
   - Gas station
   - Barber shop
4. Design analog computer of
   $x1^{\cdot} = -k12x1 + k21x2$
   $x2^{\cdot} = k12x1 - (k21 - k23)2$
   $x3^{\cdot} = k23x2$
5. Design analog computer of
   A) $KR(t) = At^{\cdot} + Bt^{\cdot\cdot} + Dt$

Lab 2:

1. Consider a Airport System with Business and Economy Boarding Services. The process in the airport is described as follows:

- On average, 100 pessenger per hour enter the airpot.
- Having entered the Airport, only 70% go straight to the Checkin Counter whereas the 30% checkin online and directly goes to the security check
- After the Security check, everyone waits for the boarding
- As per the boarding services (business/economy), passenger enters the plane through the specific gate

Design Discrete System simulation using anylogic or by hand

2. Consider a bank with an ATM inside. The process in the bank is described as follows:

- On average, 45 clients per hour enter the bank.
- Having entered the bank, half of the clients go to the ATM, and the other half go straight to the cashiers.
- Usage of the ATM has a minimum duration of 1 minute, a maximum of 4 minutes, and a most likely duration of 2 minutes
- Service with a cashier takes a minimum of 3 minutes and a maximum of 20 minutes, with a most likely duration of 5 minutes.
- After using the ATM, 30% of the clients go to the cashiers. The others exit the bank.
- There are 5 cashiers in the bank, and there is a single shared queue for all the cashiers.
- After being served by a cashier, clients exit the bank.

Design Discrete System simulation using anylogic or by hand

3. Estimate the value of Pi using excel sheet