SYSTEM SIMULATION AND MODELLING

LECTURE 2

Section A

TOPIC COVERD:Components of a System, Discrete
and Continuous Systems, Model of a System
and Types of Models

COMPONENTS OF SYSTEM

O The various components of a system are as follows :

O **1. Entity:** An object of interest in the system. Any component in the system which requires explicit representation in the model and that can change the state of the system.

O **2. Attribute:** The property of an entity: speed, capacity.

O **3. Activity:** Represents a time period of specified length. If a bank is being studied, customers might be one of the entities, the balance in their checking accounts might be an attribute, and making deposits might be an activity.

4. State: A collection of variables necessary to describe a system at a particular time, relative
to the objectives of a study. In a study of a bank, examples of possible state variables are
the number of busy tellers, the number of customers in the bank, and the time of arrival of
each customer in the bank.
5. Event: A instantaneous occurrence that might change the state of the system: breakdown
6. System: A collection of entities that interact together over time to accomplish one or more
goals.

O **7. Model:** An abstract representation of a system, usually containing logical and/or mathematical

relationships which describe a system in terms of   state, entities, and their attributes, sets,events, activities, and delays.

O **8. Item:** Any component in the system which requires explicit representation in the model and that cannot change the state of the system.

O **9. Action:** An action is a series of changes to the state; every individual change is called an action.

MODELS

O Models are representations and, therefore, their depictions and specifications can take many forms. Probably the most convenient way to represent a system is by using a textual description.

O **1.** based on the state of the system as it evolves over time;

O **2.** focused on the stochastic nature of the model;

O **3.** representative of the dynamic, physics-based processes of the system;

O **4.** described according to the systems' multidomain or multielement makeup; or

O **5.** composed of a hybrid of more than one of these modeling flavors.

TYPES OF SYSTEM MODEL