Modeling and Simulation of Discrete Event Systems
Solution- Assignment 1

Q1.   Attribute is property of an
   (a) **Entity**
   (b) Model
   (c) Event
   (d) None of these

Q2.   Which one is the instantaneous occurrence that might change the state of system
   (a) Entity
   (b) Attribute
   (c) **Event**
   (d) Model

Q3.   In a banking system, which one of the following can be considered as an event?
   (a) Customers
   (b) Making deposits
   (c) **Departure of a customer**
   (d) Number of customers awaiting

Q4.   In a production system, which one of the following can be considered as an activity?
   (a) Breakdown of machine
   (b) Breakdown rate
   (c) **Welding**
   (d) Status of machine

Q5.   In communication systems, messages can be considered as which type of system component?
   (a) **Entities**
   (b) Attributes
   (c) Activity
   (d) State variables

Q6.   In an inventory system, levels of inventory can be considered as which type of system component?
   (e) Entities
   (a) Attributes
   (b) Activity
   (c) **State variables**

Q7.   If the relationships that compose the model are simple enough and mathematical methods (such as algebra, calculus, or probability theory) can be used to obtain *exact* information on questions of interest; solution method is called
   (a) **Analytical solution**
   (b) Simulation
   (c) Computer solution
   (d) Unique solution

Q8.   A set of subprograms used to generate random observations, is called as
   (a) **Library routine**
   (b) Event routine
   (c) Timing routine
   (d) Initialization routine

Q9. In which of the following system, state variables change continuously with respect to time?
(a) Discrete system
(b) **Continuous system**
(c) Static of system
(d) Dynamic system

Q10. Discrete event simulation models mean simulation model is
(a) **Discrete, dynamic, and stochastic**
(b) Discrete, static and deterministic
(c) Discrete, static and stochastic
(d) Discrete, dynamic and deterministic

Q11. Match the items in two columns provided below:

(A) Initialization routine
(B) Timing routine
(C) Event routine
(D) Library routine

(i) A subprogram that determines the next event from the event list and then advances the simulation clock to the time when that event is to occur
(ii) A set of subprograms used to generate random observations
(iii) A subprogram to initialize the simulation model at time zero
(iv) A subprogram that updates the system state when a particular type of event occurs (there is one event routine for each event type)

(a) A-i, B-ii, C-iii, D-iv
(b) **A-iii, B-i, C-iv, D-ii**
(c) A-i, B-iv, C-iii, D-ii
(d) A-i, B-iii, C-ii, D-iv

Q12. Match the items in two columns provided below:

(A) System state
(B) Simulation clock
(C) Event list
(D) Statistical counters

(i) Variables used for storing statistical information about system performance

(ii) A list containing the next time when each type of event will occur

(iii) A variable giving the current value of simulated time

(iv) The collection of state variables necessary to describe the system at a particular time

(a) A-iii, B-ii, C-i, D-iv
(b) A-ii, B-i, C-iii, D-iv
(c) A-i, B-iii, C-iv, D-ii
(d) **A-iv, B-iii, C-ii, D-i**

Q13. Which of the following statement is/are correct for Static simulation model?

(i) Model does not contain any probabilistic component
(ii) Representation of a system at a particular time (time plays no role)

(a) Only i

(b) Only ii
(c) Both i and ii
(d) Neither i nor ii

Q14. Match the items in two columns provided below:

(A) System   (i) State variable change instantaneously at separated points in time

(B) Stali of system   (ii) State variable change continuously with respect to time

(C) Discrete system   (iii) Collection of entities that act and interact together towards accomplishment of some logical end

(D) Continuous system   (iv) Collection of variables necessary to describe system at any time, relative to objectives of study

(a) A-iv, B-i, C-iii, D-ii
(b) A-ii, B-iii, C-iv, D-i
(c) A-iii, B-iv, C-i, D-ii
(d) A-i, B-ii, C-iii, D-iv

Q15. Which of the following statement is/are correct for Deterministic model?

(i)   Model does not contain any probabilistic component
(ii)   A system of model which evolves over time
(iii)   Representation of a system at a particular time (time plays no role)

(a) Only i
(b) Both i and ii
(c) Only iii
(d) Both i and iii