



THE NATIONAL CENTER  
FOR SIMULATION

**MODELING & SIMULATION SAMPLE CERTIFICATION EXAM**

**MARCH 2017**

ST-1 The individual responsible for maintaining and validating schedules and simulator deliverables is the \_\_\_\_\_.

- a. Lead project simulation engineer
- b. Simulator validation lead
- c. Project manager
- d. Customer validation lead

ST-2 The primary objectives upon which simulator deliverables are validated is which of the following.

- a. Performance and maintainability
- b. Performance, cost and schedule.
- c. Customer validation and satisfaction
- d. Developer validation and satisfaction

ST-3 Given the functional design process, which election contains the primary building blocks of a simulator?

- a. Mathematical system, power plant system, and avionic system
- b. Instructor station, operator station, and incoming power
- c. Instructor station, trainee station, and operator station
- d. Validation equipment, test equipment, support equipment, and maintenance equipment

ST-4 Given the numerous types of simulations available, this type of game simulation is designed to educate users and solve a real-world problems.

- a. Strategy game
- b. Augmented game
- c. Board game
- d. Serious Game

ST-5 There are three primary model types, what are they?

- a. Process model, physical model, and the simulated model
- b. Mathematical mode, process model, and physical model
- c. 3D model, 2D model, and linear model
- d. Theoretical mode, actual model, and logical model

ST-6 Which selection is the more appropriate definition of a simulation?

- a. The development and integration of virtual models in order to produce a virtual environment
- b. The point where a player immerses themselves within a virtual environment
- c. Where a player interacts within a simulated environment and attempts to successfully win the game
- d. Where virtual and/or physical models are mixed within an environment where the user interacts to gain critical knowledge

ST-7 This form of modeling is considered non-destructive modeling?

- a. Additive Modeling
- b. Parametric Modeling
- c. NURB modeling (Non-uniform Rational B-Spline)
- d. Polygon Modeling

ST-8 The elementary building block essential to all virtual models is the \_\_\_\_\_.

- a. Spline
- b. Function
- c. Line
- d. Point

ST-9 A component utilized in modeling in order to generate curved-volumetric surfaces is the \_\_\_\_\_ tool.

- a. Spline
- b. NURB (Non-uniform Rational Basis Spline)
- c. Polygonal
- d. Parametric

ST-10 This individual is known for developing the first simulator used in World War 2.

- a. Orville Wright
- b. Henri Giffard
- c. Alberto Santos-Dumont
- d. Edward Link

ST-11 This is the practice of selecting strategies and calculating probabilities in order to forecast future events in serious games.

- a. Probabilistic Theory
- b. Event Theory
- c. Game Theory
- d. Conflict Strategy

ST-12 The process by which all textures and motions of a model are converted to key-frame movements is known as \_\_\_\_\_.

- a. Thresholding
- b. Model Conversion
- c. Model Evolution
- d. Backing

ST-13 In game simulations, the game-loop is responsible for \_\_\_\_\_.

- a. Maintaining simulation constructs
- b. Calculating object movement
- c. The primary events in rendering game play
- d. The maintaining of simulation meta-data

ST-14 This external stimuli is missing in virtual reality.

- a. The audible effects of the simulations environment
- b. The sounds of the simulation's background noise
- c. The game play audio.
- d. The surrounding stimuli external from the user

ST-15 This type of reality is where the user interacts with both virtual and physical environments in realtime.

- a. Virtual reality
- b. Augmented reality
- c. Mixed reality
- d. Diminished reality

ST-16 An environment where the player interacts with only simulated environments and objects is called \_\_\_\_\_.

- a. Virtual reality
- b. Augmented reality
- c. Mixed reality
- d. Altered reality

ST-17 When converting an RGB image to grayscale, which pixel hue (Red, Green, Blue) requires the MOST amount of change in its intensity:

- a. Red
- b. Green
- c. Blue
- d. None

ST-18 Within a modeling engine, the \_\_\_\_\_ objects possess the most basic of attributes.

- a. Inchoate
- b. Elementary
- c. Simplex
- d. Primitive

ST-19 Which of the following is NOT the purpose of the registration point/transform point of a game object?

- a. To define the rotational axis of the object
- b. To enable the game object motion ability
- c. For collision detection
- d. For identifying object viability/presence

ST-20 What is the primary definition of a serious game?

- a. A game that simulates actual effects and actions from actual missions.
- b. A game developed only for scientific research.
- c. A game that is played by all users who possess the intent of simulating actual events
- d. A game simulation designed to educate, evaluate, and conduct scientific research

ST-21 When implementing walk cycles, the animator should begin implementation at what part of the cycle?

- a. The point where key frames are setup
- b. Placing the avator at the center location of the screen
- c. With the extreme cycles of the movement
- d. With the leg movements of the cycle

ST-22 The three primary models are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

- a. Aircraft, Ship, and Land
- b. Design, Method, and Completion QUESTION: all academia?
- c. Plastic, Wood, and Ceramic
- d. Process, Mathematical, and Physical

ST-23 The definition of Integrated Logistics Support (ILS) does not include which element?

- a. Maintenance Planning
- b. Manpower and Personnel
- c. Training and Training Support
- d. Electromagnetic Compatibility

ST-24 Out of the following examples, which example identifies the more appropriate reason for utilizing a simulator?

- a. Simulators cost 10% -15% of the actual support and maintenance of physical hardware
- b. Simulators provide a more realistic experience
- c. Simulators are usually less complex than the physical hardware
- d. Training in a simulator is as safe as operating the parent hardware

ST-25 You are totally immersed within visual/audio effects while riding a simulation experience without motion at a theme park, but you feel sick. Why?

- a. The screen has totally immersed your viewing area
- b. The temperature of the simulator is above normal
- c. The simulation experience is different from playing the virtual game
- d. Your brain receives conflicting cues about what you're experiencing

ST-26 What is the simulation pipeline?

- a. This is the video stream from your monitor to your physics engine
- b. This is the audio and video path utilized by your modeling engine
- c. This is the efficiency process used to maximize simulation development
- d. This is a deformation object in a modeling engine

ST-27 The TER (Training Effectiveness Ratio) defines the level of training effectiveness when transferring from simulator to physical hardware. If, after spending five hours in a simulator, you only require 10 hours of hardware time to actually become effective in a procedure that normally took 75 hours; calculate the TER for the simulator?

- a. 5.0
- b. 3.5
- c. 13.0
- d. 4.22

ST-28 Discrete simulation events occur in nonlinear intervals where continuous events occur in increments of time.

- a. True
- b. False

ST\_29 Which of the following is the most effective means in protecting intellectual property?

- a. Copyright
- b. Patents
- c. Institutional record

d. Trademarks

ST-30 This simulation taxonomy utilizes human participation and simulation in order to interact with physical and simulated equipment. Most military strategic simulation.

- a. Virtual simulation
- b. Live simulation
- c. Constructive simulation
- d. Discrete simulation

ST-31 What is the reference pose of an avatar?

- a. A pose used for duplicating avatars
- b. A pose only used in spline animation
- c. The primitive pose
- d. The "T" pose

ST-32 These types of models emulate real-world characteristics and conditions in order to simulate and predict natural events.

- a. Placebo models
- b. Environmental models
- c. Physical models
- d. Theoretical models

ST-33 In order to maximize the rate of return of a grocery store, the district manager utilizes \_\_\_\_\_ simulations in order to determine the flow of customer patronage.

- a. Continuous
- b. Discrete
- c. Maximal
- d. Pedestrian

ST-34 In order to influence the behavior of the mesh when joints are moved, the \_\_\_\_\_ process attaches the polygon mesh to the vertices of the model.

- a. Baking
- b. Threading
- c. Binding
- d. Stitching

ST-35 In order to prepare a model for export to a third-party environment, the model must be \_\_\_\_\_.

- a. Baked
- b. Stitched
- c. Bound
- d. Collapsed

ST-36 One of the following selection does NOT define a process of the animation pipeline.

- a. Idea concepts (the main plot), Rigging, Final compiling
- b. Rigging, Visualization, Scene development
- c. Rigging, Idea concepts (the main plot), Exporting content
- d. Lighting effect and scoring, Idea concepts (the main plot), Support

ST-37 In the \_\_\_\_\_, each platform controls rendering and signaling over a subset of elements while rendering objects defined by its current game state.

- a. Peer-to-Peer model
- b. Client-Server model
- c. Distributive model

ST-38 Which of the following is NOT a subsystem implemented within a game engine's event loop? (select all that apply)

- a. Camera
- b. Staging
- c. Physics
- d. Streaming

ST-39 In the simulation pipeline, which process is NOT used to maximize efficiency of the simulation process?

- a. Idea concepts, Visualization, Scene development, Exporting
- b. Visualization, Rigging and animation, Scene development, Lighting
- c. Idea concepts, Rigging and animation, Maintenance, Exporting
- d. Idea concepts, Simulator maintenance, Scene Development

ST-40 Which of the following are "functional" aspects that must be implemented within a game engine event loop?

- a. Update scene lighting, update camera, update collisions
- b. Update dynamics/collisions, update camera movements, render scene
- c. Update device I/O, update camera, update physics
- d. Update device I/O, update animations, update staging

ST-41 What are the three fundamental types of game loop architectures.

- a. Non-event driven, call-back driven, and single threaded
- b. Event driven, call-forward driven, and single threaded
- c. Scene driven, call-forward driven, and multithreaded
- d. Event driven, call-back driven, and multithreaded

ST-42 Because of advancements and complexities in simulation engineering, the \_\_\_\_\_ is becoming extensively used.

- a. Call-back architecture
- b. Event driven architecture
- c. Multithreaded architecture

ST-43 Of the following selections, which are basic principles in the animation process. (select all that apply)

- a. Secondary actions
- b. Scene Rendering
- c. Collision detection
- d. Follow through

ST-44 When equal intensities of subtractive colors are combined, they produce the color \_\_\_\_\_.

- a. Gray
- b. Black
- c. Yellow
- d. White

ST-45 Raster images are resolution \_\_\_\_\_ while vector images are resolution \_\_\_\_\_.

- a. Independent, Independent
- b. Independent, Dependent
- c. Dependent, Dependent
- d. Dependent, Independent

ST-46 There are five primary steps involved when developing a walk sequence; which of the following is NOT part of the sequence. (select all that apply)

- a. Default pose, Animating the extreme cycles, Tweaking
- b. Animating the extreme cycles, Animating internal cycles, Validation
- c. Animating the internal cycles, Duplicating cycles, Defining the end pose

d. Default pose, Tweaking, Animating internal cycles, Duplication

ST-47 In the client/server model of a multiplayer game/simulation, \_\_\_\_\_ the primary game board and metadata (clients current position and other statistics), and continually signals distributive platforms when an opposing player, or players, should be rendered into view.

- a. The client maintains
- b. The server maintains
- c. Both the client and server maintain

ST-48 In the peer-to-peer model of a multiplayer game/simulation, \_\_\_\_\_ specific to its environment while corrodinating rendering to peers.

- a. The client renders objects
- b. The server renders objects
- c. The client and server both render objects

ST-49 The alpha channel is used in manipulating the \_\_\_\_\_ of a material.

- a. The color saturation level
- b. The hue saturation level
- c. The brightness level
- d. The transparency level

ST-50 "Soft real-time agent-based computer simulations" are primarily \_\_\_\_\_, and includes many of today's current simulations.

- a. Antiquated games and simulations
- b. Antiquated games and 4th generation simulations
- c. 3D and 4D legacy game simulations
- d. 2D and 3D legacy game simulations

ST-51 Vector images are resolution \_\_\_\_\_ while raster images are resolution \_\_\_\_\_.

- a. Independent, Independent
- b. Independent, Dependent
- c. Dependent, Dependent
- d. Dependent, Independent

ST-52 A vector image utilizes \_\_\_\_\_ in order to define its image characteristics?

- a. Solid geometry
- b. Multi-dimensionality
- c. Primitive geometric shapes
- d. Primitive algebraic equations

ST-53 When manipulating the transparency of material or texture, you are \_\_\_\_\_.

- a. Changing the Threshold channel of the texture
- b. Changing the Saturation channel of the texture
- c. Changing the Brightness channel of the texture
- d. Changing the Alpha channel of the texture

ST-54 When an equal intensity of additive colors are combined, they produce the color \_\_\_\_\_.

- a. Gray
- b. Black
- c. Yellow
- d. White

ST-55 The color gamut of a standard grayscale raster image is defined as:

- a. 256x256x256
- b. 255x255x255
- c. 256x255
- d. 255x256

ST-56 There are multiple image families defined, but these two families delineate how a particular image will be utilized.

- a. Raster and Joint Photographic Experts Group (JPG) images
- b. Raster and Digital Imaging and Communications in Medicine (Dicom) images
- c. Additive and Subtractive images
- d. Vector and Raster images

ST-57 When converting an image from RGB to grayscale there three functional scales utilized: 10%, 30%, and 60%. As such, what RGB channels are associated with each color scale?

- a. Red , Green, Blue
- b. Green, Red, Blue
- c. Blue, Green, Red

d. Blue, Red, Green

ST-58 Project management encapsulates several phases of execution, and each phase maintains a specific order of execution within the project. What is the correct order of execution?

- a. Definition, Executing, Planning, Budgeting, Close-out
- b. Concept, Planning, Budgeting, Executing, Monitoring
- c. Concept, Definition, Execution, Evaluation and Control, and Close-out
- d. Definition, Concept, Execution, Evaluation and Control, Close-out

ST-59 This type of document gives the assignee exclusive legal right to publish and distribute, or transfer, the identified work/material as appropriate.

- a. Patent
- b. Copyright
- c. LLC
- d. Trade Mark

ST-60 The failure rate of a system ( $\lambda$ ) is described as which of the following?

- a. Multiplying the Mean -Time- Between- Failures (MTBF) of the simulator by 3.1416
- b. The frequency with which an engineered system or component fails, expressed in failures per unit of time.
- c. Mean -Time - To- Repair (MTTR)
- d. Referring to the log-normal tables