

**B.Tech DEGREE EXAMINATION, MAY 2024**

Seventh Semester

**18CSE438J - COMPUTER ANIMATION AND SIMULATION***(For the candidates admitted during the academic year 2018-2019 to 2021-2022)***Note:**

- i. **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40<sup>th</sup> minute.
- ii. **Part - B** and **Part - C** should be answered in answer booklet.

**Time: 3 Hours****Max. Marks: 100****PART - A (20 × 1 = 20 Marks)****Marks BL CO**

Answer all Questions

- |  |   |   |   |
|--|---|---|---|
| 1. Squash and stretch, timing, secondary action, slow in and slow out, and arcs establish the ____ of objects in the scene<br>(A) physical basis (B) animation<br>(C) spline (D) interpolation   | 1 | 2 | 1 |
| 2. There is a standard set of ____ lights that are used to illuminate the central figure in a scene.<br>(A) 2 (B) 3<br>(C) 4 (D) 7   | 1 | 3 | 2 |
| 3. The 180 degree rule states that when showing the two figures, one after the other, in isolation, the camera should stay on the ____ side of the line of action<br>(A) Opposite (B) Perpendicular<br>(C) same side (D) parallel            | 1 | 2 | 2 |
| 4. The Hermite formulation requires ____ information at the endpoints<br>(A) tangent (B) cosine<br>(C) sine (D) curvature  | 1 | 3 | 2 |
| 5. Affine transformations are defined by a 3X3 matrix followed by a ____<br>(A) Scaling (B) Rotation<br>(C) Transition (D) Translation   | 1 | 2 | 1 |
| 6. ____ uses unevenly spaced intervals in an attempt to get the greatest accuracy using the smallest number of function evaluations.<br>(A) Spline curvature (B) Interpolation<br>(C) Gaussian quadrature (D) Affine transformations         | 1 | 3 | 2 |
| 7. The distance-time curve is defined by the integral of the ____ and relates time and distance along the space curve through a function S(t).<br>(A) distance time curve (B) tangential curve<br>(C) velocity-time curve (D) velocity curve | 1 | 3 | 2 |
| 8. ____ can be defined along the curve as a moving coordinate system, (u, v, w), determined by the curve's tangent and curvature.<br>(A) Animation frame (B) Scene orientation<br>(C) Gaussian frame (D) The Frenet frame                    | 1 | 1 | 2 |
| 9. ____ is the Unity Animation system<br>(A) Blender (B) Maya<br>(C) Skeletal Window (D) Mecanim   | 1 | 2 | 3 |

- |   |   |   |   |   |
|---|---|---|---|---|
| 10. _____ is the name of the component used to connect animation clips with particular game object<br>(A) state machine<br>(C) animator controller                                      | (B) clips controller<br>(D) animator design | 1 | 1 | 3 |
| 11. _____ makes a transition that not interruptible by other transitions<br>(A) atomic<br>(C) trigger   | (B) solo<br>(D) mute                        | 1 | 1 | 4 |
| 12. Unity's _____ offers a simple and intuitive interface for creating and manipulating rigid bodies and colliders.<br>(A) animator<br>(C) trigger                                      | (B) thread<br>(D) physics engine            | 1 | 3 | 4 |
| 13. Rotations in Unity are represented by _____<br>(A) angles<br>(C) quaternions  | (B) torques<br>(D) space domain             | 1 | 1 | 3 |
| 14. _____ are a special kind of Tool that automatically resets its value to false after it has been used<br>(A) Animations<br>(C) Colliders   | (B) Intruders<br>(D) Triggers               | 1 | 2 | 4 |
| 15. At each new frame, each particle's lifetime attribute is decremented by one. When the attribute reaches zero, the particle is _____ from the system<br>(A) activated<br>(C) removed | (B) hidden<br>(D) duplicated                | 1 | 3 | 5 |
| 16. _____ refers to any animation or change applied to the position and rotation of the topmost (root) object in the mesh hierarchy.<br>(A) Root Motion<br>(C) curve motion             | (B) Tween motion<br>(D) spin motion         | 1 | 1 | 5 |
| 17. _____ refers to how many frames it takes for a movement to happen<br>(A) Spacing<br>(C) Graphics  | (B) Timing<br>(D) Animation                 | 1 | 1 | 4 |
| 18. _____ are simple 2D objects that have graphical images<br>(A) Sprites<br>(C) Animations   | (B) Colliders<br>(D) Rigid body             | 1 | 2 | 5 |
| 19. The _____ is used to move around the scene without affecting any objects<br>(A) move tool<br>(C) scaling tool   | (B) rotate tool<br>(D) hand tool            | 1 | 3 | 6 |
| 20. A simplified humanoid bone structure that Mechanism understands and animate is called _____.<br>(A) Rigid body<br>(C) Bones   | (B) Skeleton<br>(D) Avatar                  | 1 | 1 | 6 |

**PART - B (5 × 4 = 20 Marks)**

Answer **any 5** Questions

- |   |   |   |   |
|---|---|---|---|
| 21. Illustrate the four level of hierarchy for a simple animation production.   | 4 | 4 | 1 |
| 22. Consider the aircraft in its initial orientation and in the orientation represented by the values of (10, 45, 90). Rz(90)Ry(45)Rx(10). State the effects of changing the x-axis,y-axis and z-axis rotation values | 4 | 5 | 1 |
| 23. Compare interpolation and approximating splines.  | 4 | 4 | 1 |
| 24. State the additional setup and tweaking at the import stage of the sprite atlas to the Unity scene  | 4 | 3 | 3 |

25. How can you record the state of the mesh in different pose of the animator object?	4	4	4
26. Mention the steps to add prefabs into the imported prototyping assets to a scene	4	3	5
27. Create an Avatar that spans across three views in the interface.	4	6	6

**PART - C (5 × 12 = 60 Marks)**

**Marks BL CO**

Answer all Questions

28. (a) Are direct interpolation of transformation matrices not acceptable? Justify. Discuss about the alternative representations. (OR) (b) Discuss about transition in animator controller , Looping mirroring and offsetting the animations	12	5	1
29. (a) Implement inverse kinematics to a rigid character model into Unity (OR) (b) Write a code snippet to calculate how far an object should travel over time using speed distance formula for a moving object in Unity	12	3	2
30. (a) Discuss the scene transitions using Mecanim state machine in the Animator window. (OR) (b) Elaborate Mass-spring-damper modeling of flexible objects with a suitable example	12	1	2
31. (a) The Particles are modeled as having a finite life span in animations. Discuss the particle assumptions and life cycle. (OR) (b) Explain the steps to create an interactive scene of opening the door using a button press	12	3	3
32. (a) Briefly discuss animating facial expressions with Blend shapes (OR) (b) Give short notes on (i) Creating rigged characters (4 Marks) (ii) Retargeting Avatar (4 Marks) (iii) Create a working Avatar for a character mesh (4 Marks)	12	1	6

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