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B.Tech DEGREE EXAMINATION, NOVEMBER 2023

Seventh Semester

18CSE438J - COMPUTER ANIMATION AND SIMULATION

(For the candidates admitted during the academic year 2020 - 2021 & 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 40th 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)

Answer **all** Questions

		Marks	BL	CO
1.	Appeal, solid drawing, and follow through/overlapping action are principles that address the _____ design of an action or action sequence. (A) Modular (B) Dynamic (C) Aesthetic (D) High level	1	2	1
2.	_____ are standard set of three lights that are used to illuminate the central figure in a scene (A) key light, the fill light, and the rim light (B) key light, the edge light, and the rim light (C) bright light, the dim light, and the medium light (D) key light, the head light, and the rim light	1	2	1
3.	For example, if the animator wants the position of an object to be (5, 0, 0) at frame 22 and the position to be (5, 0, 0) at frame 67, then values for the position need to be generated for frames 23 to 66. _____ could be used. . (A) Spline Interpolation (B) Linear interpolation (C) Perpendicular interpolation (D) Non linear interpolation	1	3	1
4.	_____ is an interpolating function that requires only positional information. (A) Parabolic blending (B) Hermite formulation (C) Catmull-Rom (D) Option (a) and option (c)	1	2	1
5.	_____transformations are defined by a 3X3 matrix followed by a Translation (A) Cosine (B) Tangential (C) Affine (D) Gaussian	1	2	2
6.	_____ uses unevenly spaced intervals in an attempt to get the greatest accuracy using the smallest number of function evaluations. (A) Spline curvature (B) Interpolation (C) Gaussian quadrature (D) Affine transformations	1	2	2
7.	Arc length numerical estimation techniques such as Simpson's and trapezoidal integration use _____ spaced sample intervals (A) Evenly (B) Orthogonally (C) Non linearly (D) bilaterally	1	3	2
8.	The Frenet frame can be defined along the curve as a moving coordinate system, (u, v, w), determined by the curve's _____ (A) curvature (B) distance and curvature (C) angle and curvature (D) tangent and curvature.	1	5	2
9.	The default state in the animator controller is represented by _____ color (A) red (B) blue (C) orange (D) white	1	3	3

10.	_____ is a simplified humanoid bone structure that Mecanim understands and perform animation (A) Rigidbody (B) Avatar (C) Skeleton (D) Anim	1	1	4
11.	_____ component enables a game object to react when it comes into contact with other game objects (A) Collider (B) Rigid body (C) Animator (D) Property Inspector	1	3	4
12.	Unity internally uses Quaternions to represent all ____ (A) scaling (B) animations (C) rotations. (D) Translation	1	3	3
13.	The _____ is used to move around the scene without affecting any objects. (A) move tool (B) rotate tool (C) hand tool (D) scaling tool	1	2	3
14.	_____ is the name of the component used to connect animation clips with particular game object (A) state machine (B) clips controller (C) animator controller (D) animator	1	3	4
15.	In lip sync animation, _____ determine how well the mouth shapes match the sound and the emotion of the dialogue (A) timing and face (B) timing and curvature (C) key points and spacing (D) timing and spacing	1	3	4
16.	_____ Enables realistic physic simulation to act on Game Objects with 3DMeshes and will be trigger detection events on box colliders (A) Rigidbody (B) state machine (C) clips controller (D) animator controller	1	3	5
17.	void Start() is called whenever an object containing the script is ____in the scene. (A) Deleted (B) Added (C) Instantiated (D) Called	1	3	6
18.	A _____ contains a collection of game objects that constitute the world that the player sees at any time (A) Scene (B) Package (C) Project (D) Class	1	2	5
19.	____ are used for creating multiple instances of a common object (A) Packages (B) Class (C) Prefabs (D) Element	1	2	5
20.	When you create a script in Unity, Unity creates a class that extends _____. (A) a) Component (B) MonoBehaviour (C) ComponentBehaviour (D) ScriptClass	1	3	5

PART - B (5 × 4 = 20 Marks)

Answer **any 5** Questions

		Marks	BL	CO
21.	Consider a scenario of conversation between two figures and discuss the camera orientation.	4	3	1
22.	Discuss the two problems may be encountered with Newton-Raphson iteration in generating the sequence of points	4	2	1
23.	How can you use Unity physics system to objects and make them behave realistically?	4	3	2
24.	Mention the steps to Generate key frames for a camera fly-through animation	4	3	3
25.	Discuss the types of Render Mode field to control particle display	4	2	4

		Marks	BL	CO
26.	State the settings to set the real-world size to a rigged character.	4	2	5
27.	Create an Avatar that spans across three views in the interface	4	6	6

PART - C (5 × 12 = 60 Marks)

Answer **all** Questions

		Marks	BL	CO
28.	(a) Are direct interpolation of transformation matrices is not acceptable? Justify. Discuss about the alternative representations	12	5	1
	(OR)			
	(b) Discuss tweening techniques with its strength and limitations			
29.	(a) Implement inverse kinematics to a rigid character model into Unity.	12	3	2
	(OR)			
	(b) Write the code snippet to calculate how far an object should travel over time using speed distance formula for a moving object in Unity			
30.	(a) Create a 2D sprite doll animation with the animation view Using Mecanim states for animating UI button states	12	6	3
	(OR)			
	(b) Elaborate Mass-spring-damper modeling of flexible objects with a suitable example			
31.	(a) The Particles are modeled as having a finite life span in animations. Discuss the particle assumptions and life cycle.	12	2	5
	(OR)			
	(b) Discuss the steps to create an interactive scene using animation clips, Mecanim system and the Event System			
32.	(a) Discuss the different approaches for facial model design and animation	12	2	6
	(OR)			
	(b) Discuss the method to create a Blend Tree to smoothly blend multiple humanoid animations.			

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