b. Write short notes on   12   1   4   5
   (i)   Working with camera and lights
   (ii)   Inspector window

32. a. How collisions are identified? Explain the usage of different types of colliders.   12   3   5   9

(OR)

b. What is animation in unity? How can you add animation in unity?   12   3   5   9

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Reg. No.														

B.Tech. DEGREE EXAMINATION, JUNE 2023
Sixth Semester

18CSE464T – COMPUTER GRAPHICS AND GAME PROGRAMMING
(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 40th minute.
(ii)   **Part - B & 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	PO

1. How many methods are there for producing color display?   1   1   1   3
   (A) 5   (B) 4
   (C) 3   (D) 2

2. Distortion effects produced when representing a high-resolution signal at a lower resolution is called   1   1   1   3
   (A) Anti-aliasing   (B) Aliasing
   (C) Blurring   (D) Muddy

3. _____ allows screen positions to be selected with the touch of a finger.   1   1   1   3
   (A) Touch panels   (B) Image scanner
   (C) Light pen   (D) Mouse

4. In DDA line drawing algorithm when the slope is greater than 1, we calculate the net 'X' value by   1   3   1   3
   (A) $X_{k+1} = X_{k-1}$ (B) $X_{k+1} = X_k + \dfrac{1}{m}$

   (C) $X_{k+1} = X_{k+1}$ (D) $X_{k+1} = X_k - \dfrac{1}{m}$

5. Which of the following refers to the shapes created by union, intersection and difference of given shapes?   1   1   2   2
   (A) Wireframe model   (B) Composite transformation
   (C) Constructive solid geometry methods   (D) Destructive solid geometry methods

6. If a point (x, y, z) is to be translated by an amount dx, dy and dz respectively, then what will be the value of the new translated points (x_1, y_1, z_1)?   1   2   2   2
   (A) $x_1 = x, y_1 = y, z_1 = z$ (B) $x_1 = dx, y_1 = dy, z_1 = dz$
   (C) $x_1 = x + dx, y_1 = y + dy, z_1 = z + dz$ (D) $x_1 = x - dx, y_1 = y - dy, z_1 = z - dz$

7. The Cohen Sutherland line clipping algorithm divides the region into _____ number of space.   1   1   2   2
   (A) 8   (B) 6
   (C) 7   (D) 9

8. The shape of the Bezier curve is controlled by   1   1   2   2
   (A) Control points   (B) Knots
   (C) End points   (D) Tangents

9. In which of the following projection the object size differs when we look from different distances?   1   1   3   2
   (A) Parallel projection   (B) Cavalier projection
   (C) Perspective projection   (D) Cabinet projection

10. Which of the following refer to a model that represent all the dimension of an object external as well as interval?   1   1   3   2
    (A) Wire frame model   (B) Constructive solid geometry
    (C) Composite transformation   (D) Destructive solid geometry

11. Who developed the phong shading model?   1   1   3   3
    (A) DUI tuang phong   (B) BUI tuang phong
    (C) Cohen-Sutherland   (D) Hodegman phonf

12. RGB color model uses the prime RGB colors because they are   1   1   3   3
    (A) Safe colors   (B) Web colors
    (C) Safe web colors   (D) Bright colors

13. When you import an object from other platform to unity, it is called as   1   1   4   3
    (A) Asset   (B) Jewel
    (C) Tool   (D) Sprite

14. For scripting in unity the following language is not available.   1   1   4   3
    (A) Java   (B) C#
    (C) Python   (D) C++

15. Which function can be called more than once per frame?   1   2   4   5
    (A) Update ( )   (B) Fixed update ( )
    (C) Late update ( )   (D) Late bind ( )

16. The properties of a Gabe object can be set through   1   1   4   9
    (A) Project window   (B) Console
    (C) Inspector   (D) Animator

17. Which is not a type of collider?   1   1   5   3
    (A) Box   (B) Mesh
    (C) Capsule   (D) Basket

18. In sprite renderer which feature is used in major for 3D physics?   1   1   5   5
    (A) Color   (B) Material
    (C) Sorting   (D) Layering

19. _____ are used to draw extra information for the game object?   1   1   5   5
    (A) Sprite   (B) Prefab
    (C) Gizmo   (D) Collider

20. If multiple colliders need to be used for a game object, the need to be of   1   1   5   9
    (A) Same type   (B) Different type
    (C) No condition   (D) Common type

PART – B (5 × 4 = 20 Marks)
Answer ANY FIVE Questions

                                                            Marks   BL   CO   PO

21. Write the difference between raster scan and random scan.   4   2   1   3

22. Write about color CRT display techniques briefly.   4   2   1   3

23. Discuss about Bezier curves and B-spline curves.   4   2   2   2

24. Illustrate any three types of 3D concepts.   4   1   2   2

25. How can you differentiate ambient illustration model from diffuse illustration model?   4   2   3   2

26. Write the steps for importing an asset in the unity.   4   2   4   9

27. Explain about collision in unity.   4   2   5   5

PART – C (5 × 12 = 60 Marks)
Answer ALL Questions

                                                            Marks   BL   CO   PO

28. a. Implement the Cohen-Sutherland line clipping algorithm for a line with end points (–1, 5) and (3, 8) and window boundaries.   12   3   2   2
    (X min, Y min = (–3, 1)
    (X max, Y max) = (2, 6)

(OR)
   b. With matrix representation explain all the types of 3D transformations.   12   3   3   2

29. a.i. Describe the working principle of color CRT monitor.   6   2   1   3

    ii. Write the difference between beam penetration and shadow masking.   6   2   1   3

(OR)
   b. Explain 2D transformations with neat diagrams and matrices.   12   2   1   3

30. a. Explain about the illumination models with mathematical expressions.   12   2   3   2

(OR)
   b. Describe about any two color models in detail with illustration.   12   2   3   2

31. a. Write brief notes on the following   12   1   4   5
    (i) Assets
    (ii) Creating prefab

(OR)

31. a. A rate 1/3 convolution encoder has generating vectors $g_1 = (100)$, $g_2 = (111)$ and $g_3 (101)$ 12   3   4   2
     i.   Sketch the encoder configuration
    ii.   Draw the code tree, state diagram and trellis diagram.

(OR)

b. Explain Viterbi Algorithm for decoding of convolutions codes.   12   3   4   2

32. a. Construct a Shannon Fan code for a source which emits 7 symbols with probability 0.4, 0.2, 0.12, 0.08, 0.08, 0.08 and 0.04 respectively. Also calculate its efficiency.   12   3   4   2

(OR)

b. Determine H(x), H(y), H(x,y), H(x,y), H(x/y), H(y/x) and I(X;Y) for a ternary channel whose joint probability matrix is   12   3   5   2

$$P(x,y) = \begin{bmatrix} 0.05 & 0.04 & 0.01 \\ 0.1 & 0.2 & 0.2 \\ 0.1 & 0.1 & 0.2 \end{bmatrix}$$

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B.Tech. DEGREE EXAMINATION, JUNE 2023
Sixth and Seventh Semester

18ECE225T – INFORMATION THEORY AND CODING
(For the candidates admitted from 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 40th minute.
(ii)   **Part - B & Part - C** should be answered in answer booklet.

Time: 3 hours   Max. Marks: 100

PART – A (20 × 1 = 20 Marks)   Marks   BL   CO   PO
Answer **ALL** Questions

1. In cyclic redundancy checking, the CRC is the   1   1   1   2
   (A)   Quotient   (B)   Dividend
   (C)   Divisor   (D)   Remainder

2. In morse code, Dash is _____ times the length of the DOT.   1   1   1   2
   (A)   1   (B)   2
   (C)   3   (D)   4

3. The two types of ASCII are   1   1   1   2
   (A)   ASCII – 4 and ASCII - 8   (B)   ASCII – 8 and ASCII – 16
   (C)   ASCII – 7 and ASCII - 8   (D)   ASCII – 4 and ASCII – 16

4. The octal representation of $(15)_{10}$ is   1   1   1   2
   (A) $(31)_8$ (B) $(28)_8$
   (C) $(41)_8$ (D) $(38)_8$

5. The efficiency of the Huffman Code is inversely proportional to   1   1   2   2
   (A)   Average Length of the Code   (B)   Maximum Length of the Code
   (C)   Average Entropy   (D)   Redundancy

6. In Block coding, IF N = 5, the maximum hamming distance between two code words is   1   2   3   2
   (A)   5   (B)   3
   (C)   2   (D)   1

7. _____ codes are special linear block codes with the property that if a code word is rotated, the result is another code word   1   2   3   2
   (A)   Convolution   (B)   Cyclic
   (C)   Non Linear   (D)   Huffman

8. The source alphabet has 4 encoded binary symbols S1 = 0, S2 = 01, S3 = 11 and S4 = 00 which is   1   2   2   2
   (A)   Not uniquely decodable   (B)   Uniquely Decodable
   (C)   Prefix Free   (D)   Golay Codes

9. The prefix code is also known as
   (A) Instantaneous Code   (B) Block Code
   (C) Convolution Code   (D) Parity Bit

   (1 1 2 2)

10. The efficiency of Huffman Code is _____ than the Shannon FANO Code
    (A) Lesser   (B) Greater
    (C) Equal   (D) Moderate

    (1 1 2 2)

11. The hamming distance between 010 and 110 is
    (A) 1   (B) 2
    (C) 3   (D) 4

    (1 2 3 2)

12. The received code contains an error if the syndrome vector is
    (A) Zero   (B) Non Zero
    (C) Infinity   (D) Negative

    (1 2 3 2)

13. The measure of amount of redundancy is given by
    (A) Code Size   (B) Code Weight
    (C) Code Rate   (D) Minimum Distance

    (1 1 4 2)

14. How many number of transitions can be made at each bit time?
    (A) 1   (B) 2
    (C) 3   (D) 4

    (1 1 4 2)

15. The trellis diagram, the number of nodes _____ at successive branching.
    (A) Increases by one   (B) Doubles
    (C) Triples   (D) Decreased

    (1 1 4 2)

16. At any given time, the output of convolution encoder depends on
    (A) Past Input   (B) Present Input
    (C) Present and Past Input   (D) Future Input

    (1 1 4 2)

17. The method of converting a word to stream of bits is called as
    (A) Binary Coding   (B) Source Coding
    (C) Bit Coding   (D) Cipher Coding

    (1 1 5 2)

18. The relation between entropy and mutual information is
    (A) $I(x,y) = H(x) - H(x/y)$ (B) $I(x,y) = H(x/y) - H(y/x)$
    (C) $I(x,y) = H(x) - H(y)$ (D) $I(x,y) = H(y) - H(x)$

    (1 1 5 2)

19. When two messages are equiprobable, Entropy is
    (A) Zero   (B) Unity
    (C) Maximum   (D) Infinity

    (1 1 5 2)

20. The conditional probability $P\left(\dfrac{b_i}{a_i}\right)$ is known as
    (A) Forward Conditional Probability   (B) Reverse Conditional Probability
    (C) Entropy   (D) Mutual Information

    (1 1 5 2)

PART – B (5 × 4 = 20 Marks)
Answer ANY FIVE Questions

	Marks	BL	CO	PO

21. Determine the multiplication table for Octal Numbers — *(4 2 1 2)*

22. Verify the code 00, 01, 10, 110 and 111 are instantaneous and draw the decoding free. — *(4 2 2 2)*

23. For a systematic linear block codes, three parity check bits are given by $C_4 = d_1 + d_3$, $C_5 = d_1 + d_2 + d_3$ and $C_6 = d_2 + d_3$ construct a generation matrix and parity check matrix. — *(4 2 3 2)*

24. Define: Code Rate and constraint length of convolution encoder. — *(4 1 4 2)*

25. Show that entropy $H(x)$ is maximum when both x_1 and x_2 are equiprobable. — *(4 1 4 2)*

26. Explain ASCII code in detail. — *(4 1 1 2)*

27. Verify the given code 0, 01, 001, 0010, 0011 is uniquely decodable or not. — *(4 2 2 2)*

PART – C (5 × 12 = 60 Marks)
Answer ALL Questions

	Marks	BL	CO	PO

28. a. Determine the message to be transmitted for the message polynomial $x^4 - x^2$ Having the generator polynomial $x^3 + x + 1$ using CRC method. Also check whether the transmitted code word received at the receives is correct or not. — *(12 3 1 2)*

(OR)

b.i. With neat block diagram, Explain the model of the signaling system — *(7 3 1 2)*

ii. Explain Morse code in detail. — *(5 3 1 2)*

29. a. Obtain the Huffman Code for five symbols x_1, x_2, x_3, x_4 and x_s with probabilities 0.4, 0.2, 0.2, 0.1 and 0.1 respectively. Also calculate the efficiency of the code. — *(12 3 2 2)*

(OR)

b. Check whether the given codes satisfies Kraft's inequality or not. Also determine the efficiency of the codes.
Code A : 00, 01, 10, 110, 1110, 1101, 1111
Code B : 0, 100, 1100, 1110, 1101, 1111
Code C : 0, 10, 110, 1110, 11110, 11111 — *(12 3 2 2)*

30. a. The generator matrix for a(6,3) block code is given below. Find all the code vectors of this code.

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 1 & 0 & 1 \end{bmatrix}$$

— *(12 3 3 2)*

(OR)

b. Design a (7,4) cyclic code using encoder for the generator Polynomial $G(n) = 1 + x^2 + x^3$ and message vector 1100. — *(12 3 3 2)*