

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2020

Course: B.Tech CSE
Program: Computer Graphics for all CSE Branches
Course Code: CSEG 3003

Semester: V
Time 03 hrs.
Max. Marks: 100

Instructions: Answer questions according to their respective marks

SECTION A

1. Each Question will carry 5 Marks

2. Instruction: Complete the statement / Select the correct answer(s)/ State True or False

S. No.		Marks	CO
Q 1	<p>State True or False</p> <p>A) Straight line equation is $Y = mx + C$</p> <p>B) CRT full form is Cathode Ray Tube</p> <p>C) DVST full form is Direct View System Translation</p> <p>D) Midpoint circle drawing decision parameter in theory is $P_0 = 4/5 - r$, where r is radius</p> <p>E) GKS full form is Graphical Kernel Stack</p>	5	CO1
Q 2	<p>Select the Correct Answers:</p> <p>A) The two-dimensional translation equation in the matrix form is</p> <p>a) $P' = P + T$</p> <p>b) $P' = P - T$</p> <p>c) $P' = P * T$</p> <p>d) $P' = p$</p> <p>B) The translation distances (dx, dy) is called as</p> <p>a) Translation vector</p> <p>b) Shift vector</p> <p>c) Both a and b</p> <p>d) Neither a nor b</p>	5	CO2

	<p>C) In 2D-translation, a point (x, y) can move to the new position (x', y') by using the equation</p> <p>a) $x'=x+dx$ and $y'=y+dx$ b) $x'=x+dx$ and $y'=y+dy$ c) $X'=x+dy$ and $Y'=y+dx$ d) $X'=x-dx$ and $y'=y-dy$</p> <p>D) _____ is a rigid body transformation that moves objects without deformation.</p> <p>a) Rotation b) Scaling c) Translation d) All of the mentioned</p> <p>E) The basic geometric transformations are</p> <p>a) Translation b) Rotation c) Scaling d) All of the mentioned</p>		
<p>Q 3</p>	<p>Select all the correct statements</p> <p>a. HSV full form (Hue, Saturation and Value) b. Hi Color uses 24 bits to represent colors c. Basic three primary colors are used called as color gamut d. Light can be characterized by three perceptual terms e. True color uses 16 bits to represent colors f. The higher the luminance, the brighter the light to the observer g. Light speed in vacuum is 3×10^8 m/s</p>	<p>5</p>	<p>CO5</p>
<p>Q 4</p>	<p>Select the Correct Answers:</p> <p>A) The types of hidden surface removal algorithm are</p> <p>a. Depth comparison, Z-buffer, back-face removal b. Scan line algorithm, priority algorithm c. BSP method, area subdivision method d. All of these</p> <p>B) Scan lines are used to scan from</p> <p>a. Top to bottom b. Bottom to top c. Both a & b d. None of these</p>	<p>5</p>	<p>CO4</p>

	<p>C) The algorithm of hidden surface are</p> <ol style="list-style-type: none"> Object-space method Image-space method Both a & b None of these <p>D) The method which is based on the principle of comparing objects and parts of objects to each other to find which are visible and which are hidden are called</p> <ol style="list-style-type: none"> Object-space method Image-space method Surface-space method Both a & b <p>E) Which surface algorithm is based on perspective depth?</p> <ol style="list-style-type: none"> Depth comparison Z-buffer or depth-buffer algorithm subdivision method back-face removal 		
Q 5	<p>Select the Correct Answer:</p> <p>Perform reflection of unit cube about the xy plane.(Select the correct answer)</p> <ol style="list-style-type: none"> (0,0, -1), (1,0, -1), (1,1, -1), (0,1, -1), (0,0,0), (1,0,0), (1,1,0), (0,1,0) (0,0, 1), (1,0, -1), (1,1, -1), (0,1, -1), (0,0,0), (1,0,0), (1,1,0), (0,1,0) (0,0, -1), (1,0, -1), (1,1, -1), (0,1, -1), (0,0,1), (1,0,0), (1,1,0), (0,1,0) (0,0, -1), (1,0, -1), (1,1, -1), (0,0, -1), (0,0,0), (1,0,0), (1,1,0), (0,1,0) None of these 	5	CO3
Q 6	<p>Select the Correct Answers:</p> <ol style="list-style-type: none"> Refresh rate is measured in? (A) MBPS (B) Hertz (C) Kilo hertz (D) Mega hertz Type of monitor which is common in desktop computers is (A) Cathode-ray tube (B) Flat-panel (C) Monochrome (D) Projector The main hardware components of a graphics workstation are (A) Display devices, recorder (B) Input and output device (C) CPU and Display Processor (D) Plotter, joystick Smallest size object that can be displayed on a monitor is called (A) Picture element (B) Point (C) Dot Pitch (D) Aspect ratio Display processor is also called a? (A) Display coprocessor (B) Graphics controller (C) Output device for graphics (D) Both A and B 	5	CO1

SECTION B

- 1. Each question will carry 10 marks**
- 2. Make diagrams wherever needed.**
- 3. Write short / brief notes. Make diagrams wherever needed. Moreover, solve the problems properly with matrix representations wherever needed.**

Q 6.	What do you mean by Reflection and explain the matrix representations for reflection about X- Axis and Y axis and about the origin and about the straight line $y = x$ and $y = -x$.	10	CO2
Q 7.	Explain the Cohen- Sutherland Line clipping algorithm with proper example and diagram representation. (Algorithm is 5 marks and explaining the algorithm with a proper example is 5 marks along with diagram)	5+5=10	CO2
Q 8.	State the differences between Phong model and Gouraud model and Determine five points on a Bezier curve for Θ vertices $B_0(1,1)$, $B_1(2,3)$, $B_2(4,3)$ and $B_3(3,1)$.	5+5=10	CO5
Q 9.	Explain the Z-Buffer algorithm with proper diagram representation. Find the equation of plane passing through the points $(1,3,4)$, $(5,5,5)$ and $(7,9,4)$.	5+5=10	CO4
Q 10.	Write down the differences between Beam-Penetration and Shadow mask method explain it with the help of suitable diagram .And how much time is spent scanning across each row of pixels during screen refresh on a raster system with a resolution of $640*480$ and a refresh rate of 60 frames per second. OR Explain the basic design of CRT with a diagram and Write code snippet for implementing mouse press functionality in Open GL.	5+5=10	CO1

SECTION-C

- 1. Each Question carries 20 Marks.**
- 2. Instruction: Write long answer. Make diagrams wherever needed.**

Q 10	<p>A) After rotation of a point from position (x, y) to position (x_1, y_1) through an angle θ relative to the co-ordinate origin. The original angular displacement of the point from x-axis is ϕ then what would be the rotation matrix.</p> <p>A rectangular parallelepiped is given having length on x- axis, y- axis, z- axis as 3, 2, 1 respectively. Perform rotation by an angle -90 degree about x- axis and an angle 90 degree about y-axis.</p> <p align="center">OR</p> <p>B) Explain Composite transformation method. And Translate the square ABCD whose coordinates are $A(0,0)$, $B(3,0)$, $C(3,3)$, $D(0,3)$ by 2- units in both directions and then scale it by 1.5 units in x- direction and 0.5 units in y- direction.</p>	10+10 =20	CO3
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