Printed Page:- 04 **Subject Code:- AME0514**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: V - THEORY EXAMINATION DEC - (2024- 2025)

Subject: Computer Aided Engineering

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* ***three Sections -A, B, & C.*** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION-A 20

1. Attempt all parts:-

1-a. The nerve center or brain of any computer system is known as (CO1, K2) 1

(a) CPU
(b) Storage device
(c) ALU
(d) Monitor

1-b. The use of computer to control the operation of the production process is known as (CO1, K2) 1

(a) CAD
(b) CAE
(c) CAM
(d) CAQ

1-c. Cartesian coordinate system can be (CO2, K2) 1

(a) Left-handed
(b) Right-handed
(c) Both a and b
(d) None of the above

1-d. ….. Matrix are required for taking reflection of any point about a line y = 2x+1. (CO2, K2) 1

(a) 1

(b) 3
(c) 5
(d) 7

1-e. The basic parameter to curved attributes are (CO3, K2) 1

(a) Type
(b) Width
(c) Color
(d) All of the mentioned

1-f. The function of the pixel mask is (CO3, K2) 1

(a) To display dashes and inter dash spaces according to the slope
(b) To display curved attributes
(c) To display the thick curves
(d) None of these

1-g. The process of extracting a portion of a database or a picture inside or outside a specified region are called (CO4, K2) 1

(a) Transformation
(b) Projection
(c) Clipping
(d) Mapping

1-h. The rectangle portion of the interface window that defines where the image will actually appear are called (CO4, K2) 1

(a) Transformation viewing
(b) View port
(c) Clipping window
(d) Screen coordinate system

1-i. A triangular plane stress element has_____degree of freedom (CO5, K2) 1

(a) 3
(b) 4
(c) 5
(d) 6

1-j. In weighted residual technique, the methods adopted are (CO5, K2) 1

(a) point collocation method
(b) least squares method
(c) galerkin's method
(d) all

2. Attempt all parts:-

2.a. Differentiate between Random and Raster scan displays. (CO1, K2) 2

2.b. What is the need of graphics standards? List some of the graphics standards. 2

(CO2, K2)

2.c.	Why analytical curves are not sufficient in engineering design?(CO3 K2)	2
2.d.	What are the application of Boolean operations in graphics? (CO4, K2)	2
2.e.	Define Shape function. (CO5, K2)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Discuess about any two output devices. (CO1, K2)	6
3-b.	Discuss any one hardware input device used for computer graphics. (CO1, K2)	6
3-c.	Explain concatenate homogeneous transformation with neat diagram. (CO2, K2)	6
3-d.	Explain brashenham line drawing algorithm briefly. (CO2, K2)	6
3.e.	What is interpolation and approximation curve? (CO3, K2)	6
3.f.	Differentiate between Quadric and Super quadric surfaces? (CO4, K3)	6
3.g.	Derive the element stiffness matrix and nodal load vectors for 2 node 1D element. (CO5, K3)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Explain working principle of plasma panel and plasma displays. (CO1, K2)	10
4-b.	Explain the working of following devices: (i) Solid state monitors (ii) Emissive displays (iii) Non-emissive displays. (CO1, K2)	10

5. Answer any one of the following:-

5-a.	Derive the translation, rotation and scaling matrix in 2D transformation. (CO2, K3)	10
5-b.	Find the reflection matrix when the axis of reflection is given by y = 5x. Also determine the reflection of point (7, 3) about this line. (CO2, K3)	10

6. Answer any one of the following:-

6-a.	Differentiate between Bezier and B- spline surface with reference to number of control points, order of continuity and surface normal. (CO3, K3)	10
6-b.	A Bezier curve is defined in two-dimensional plane by the four control points $P_0(1, 1)$, $P_1(2, 3)$, $P_2(4, 3)$ and $P_3(3, 1)$. Determine seven points on Bezier curve and plot them. (CO3, K3)	10

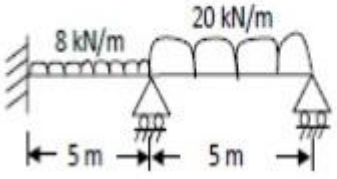
7. Answer any one of the following:-

7-a.	What are the different method for creating 3D objects in computer graphics? Explain briefly. (CO4, K3)	10
7-b.	Why do we prefer regularized, Boolean set operators to the ordinary Boolean operators? Explain with suitable examples.(CO4, K3)	10

8. Answer any one of the following:-

8-a. Analyse the beam shown in figure by finite element method and determine the end reactions. Also determine the deflections at mid spans given (CO5, K3) 10

$E = 2 \times 10^5$ N/mm^2 and $I = 5 \times 10^6$ mm^4



8-b. Explain the procedure of solving a centilever beam problem using FEA technique. (CO5, K3) 10