Printed Page:- 03 **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 - (2023 - 2024)

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) 1

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

1-b. Which of the following devices do not produce a hard copy? (CO1) 1

(a) impact printers
(b) plotters
(c) CRT terminals
(d) non-impact printers

1-c. Cartesian coordinate system can be (CO2) 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 about a line y = 2x+1. (CO2) 1

(a) 1
(b) 3
(c) 5

(d) 7

1-e. Which of the following is not a synthetic entity? (CO3) 1

(a) Hyperbola
(b) Bezier curve
(c) B-spline curve
(d) Cubic spline curve

1-f. If the slope magnitude is 1, then circles, ellipse and other curves will appear. (CO3) 1

(a) Thick
(b) Thinnest
(c) Big
(d) Rough

1-g. The father of animation. (CO4) 1

(a) Walt Disney
(b) J. Stuart Blackton
(c) William Horner
(d) J.A. Ferinard plateau

1-h. The most commonly used boundary presentation for a 3D graphics object is (CO4) 1

(a) Data polygon
(b) Surface polygon
(c) System polygon
(d) None of these

1-i. FEM gives accurate representation of (CO5) 1

(a) real geometry
(b) complex geometry
(c) real and complex geometry
(d) constant geometry

1-j. To solve the FEM problem, it subdivides a large problem into smaller, simpler parts that are called (CO5) 1

(a) Finite elements
(b) Infinite elements
(c) Dynamic elements
(d) Static elements

2. Attempt all parts:-

2.a. What is CAD? (CO1) 2

2.b. What is the main function of graphic software? (CO2) 2

2.c. What are the Spline curves? (CO3) 2

2.d. What are 3D graphics used for? (CO4) 2

2.e.	What is meant by Finite element method? (CO5)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	What are the types of printers and plotters? Explain in brief. (CO1)	6
3-b.	Describe the Cursor Control Devices with diagram. (CO1)	6
3-c.	Explain concatenate homogeneous transformation with neat diagram. (CO2)	6
3-d.	A triangle having vertices coordinates (10, 20), (10, 10), (20, 10) is rotated by 30 degrees about z-axis in counter clockwise direction. Obtain a new coordinate of vertices. (CO2)	6
3.e.	What is interpolation and approximation curve? (CO3)	6
3.f.	Explain any one visible surface identification algorithm. (CO4)	6
3.g.	Explain the stress – strain relation of an orthotropic material. (CO5)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	What are the components of CRT? What is the working principle of cathode ray tube? Explain in brief with suitable neat sketches. (CO1)	10
4-b.	Describe the Graphics Input devices with diagram and give the suitable examples. (CO1)	10

5. Answer any one of the following:-

5-a.	Find the transformed position of a line with endpoints A (3,5) and B (10,5) when it is translated by 2 units in the x-direction and then rotated by 30 degree in CW direction about the z-axis. (CO2)	10
5-b.	Explain midpoint circle algorithm briefly. (CO2)	10

6. Answer any one of the following:-

6-a.	What is a blending function? list some properties of blending functions? Explain. (CO3)	10
6-b.	What is the Hermite curve? Derive its blending function. What are the limitations of Hermite curves? (CO3)	10

7. Answer any one of the following:-

7-a.	How will you perform three-dimensional rotation about any arbitrary axis, arbitrary plane? (CO4)	10
7-b.	What is Polygon mesh? Explain the advantages of rendering by patch splitting and rendering polygons by scan line method? (CO4)	10

8. Answer any one of the following:-

8-a.	State and explain the principle of minimum potential energy. (CO5)	10
8-b.	Write the advantages, disadvantages, and limitations of Finite Element Method. (CO5)	10