

मोडर्निज
Date: 06/01/2016.

GANPAT UNIVERSITY

M. TECH CAD/CAM SEM- I CBCS (NEW)
REGULAR EXAMINATION NOV-DEC 2015
3ME 113 COMPUTER AIDED DESIGN

Max. Time: 3 hours

Max. Marks: 60 Marks

Instructions:

1. Candidate can not keep with him any paper or book related to subject during the examination.
2. Center for written examination U.V.Patel College of Engineering, Kherva.
3. Use of any electronic devices or programmable calculators is not allowed.

SECTION I

- Que 1 Attempt all [10]
(A) Explain how CAD helps to synthesize a product design and do engineering analysis for getting optimal design. [5]
(B) List the advantages of computer aided design. [5]

OR

- Que 1 Attempt all [10]
(A) How does a CRT work? [5]
(B) What are the functions of an interactive graphic design workstation? [5]

- Que 2 Attempt all [10]
(A) Derive decision parameters for the Bresenham's circle generating algorithm assuming the starting point as (0, 10) and generate the pixel positions for one fourth of a circle. [5]
(B) Write a C program for ellipse algorithm. [5]

OR

- Que 2 Attempt all [10]
(A) Calculate the pixel locations for a line having starting point (5,5) to (12,-11) using DDA line algorithm. [5]
(B) Write a C program for a Bezier curve. [5]

- Que 3 Attempt any two [10]
(A) Explain GKS computer graphics standard. [5]
(B) Give the requirements of product data exchange between dissimilar CAD/CAM systems. [5]
(C) Describe the structure of IGES file. [5]

SECTION II

- Que 4 Attempt all [10]
(A) Show that two successive reflection about either of co-ordinates axis is equal to a single rotation about coordinate origin. [5]
(B) Perform 3-D transformation of the given position vector [3 2 1 1] by the following sequence of operations [5]
(i) Translate by -1, -1, -1 in x, y, and z respectively
(ii) Rotate by +30° about x-axis and +45° about y axis

OR

- Que 4 Attempt all [10]
(A) A triangle ABC with vertices A(1,1), B(4,1) and C(3,3) is given. Perform the following transformation in sequence. [5]
a) Reflection about X axis.
b) Rotation by 90°.
(B) A scaling factor of 2 is applied in the Y direction while no scaling is applied in the X direction to the line whose two end points are at coordinates (1, 3) and (3,6). The line is to be rotated subsequently through 300°, in the counter clockwise direction. Determine the necessary transformation matrix for the operation and the new coordinates of the end points. [5]

- Que 5 Attempt all [10]
(A) Considering four dimensional position vectors for P0((0,0), P1(2,2), P2(5,-2) and P3(3,0), determine the cubic spline curve passing through them using chord approximation. The tangent vectors at the ends are P1'(1,1) and P4'(1,1). Calculate intermediate points at t=0.25 and t=0.6. [5]
(B) Differentiate between Bezier and B- spline surface with reference to number of control points, order of continuity and surface normal. [5]

OR

- Que 5 Attempt all [10]
(A) Explain the engineering application of cubic splines. [5]
(B) Given B₀(1,2), B₂(2,5), B₃(6,5) and B₄(4,2) determine 6 points on the Bezier curve. [5]

- Que 6 Attempt any two [10]
(A) Using Freudenstein's equation solve the function generator $y=x.\sin x$ over the range $1 \leq x \leq 2$, using three precision points. [5]
(B) Write a note on B-Spline. [5]
(C) Specify the three principal classifications of the geometric modeling systems and write in brief about each of them. [5]

END OF PAPER