

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2766

Roll No.

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B.Tech.

(SEM. VII) ODD SEMESTER THEORY

EXAMINATION 2013-14

COMPUTER AIDED DESIGN

Time : 3 Hours

Total Marks : 100

Note :- (1) All five questions are compulsory, attempt as instructed therein.

(2) Assume any missing data suitably.

1. Attempt any **four** parts of the following : **(5×4=20)**
 - (a) Make a table of important design phases. What are the required CAD tools to support various design phases ?
 - (b) What are various CAE activities ?
 - (c) What do you understand by Object Oriented Programming ?
 - (d) Write a program, in either C or C++, to find the radius of a circle whose area is equal to a square.
 - (e) Discuss various coordinate systems used in a CAD system.
 - (f) Compare the capabilities, advantages and disadvantages of any three types of display devices.

2. Attempt any **four** parts of the following : **(5×4=20)**
 - (a) Digitise the line with end points (20, 12) and (4.5, 17) using DDA algorithm.
 - (b) What do you understand by composite transformation ? Explain in detail.

- (c) With the help of a diagram explain working of a color monitor display device.
 - (d) What graphic functions are provided in a general purpose graphics package for creating and manipulating images ?
 - (e) Explain Homogeneous coordinates in detail.
 - (f) Rotate an object defined by A(0, 0), B(4, 0), C(4, 4), D(0, 4) by 70° counter clockwise direction about origin and find transformed coordinates.
3. Attempt any **two** parts of the following : **(10×2=20)**
- (a) Describe Hermite Spline curve and its blending function.
 - (b) What are Bezier Curves ? Discuss about the properties of such curves.
 - (c) Elaborate the following :
 - (i) Blobby objects
 - (ii) Superquadric surfaces.
4. Attempt any **two** parts of the following : **(10×2=20)**
- (a) Write 5 editing commands and 5 drawing commands in Auto-CAD.
 - (b) Elaborate the procedure for designing a Journal bearing. Also write an algorithm for design of the above.

OR

Write an algorithm for designing a helical spring.

- (c) Describe constructive solid geometry with suitable examples. How three dimensional objects having translational, rotational, or other symmetry are modeled ? Explain with suitable examples.

| UPTU Notes |

5. Attempt any **two** parts of the following : **(10×2=20)**

(a) Explain the method of solving a design problem using FEM.
Also write the advantages of FEM.

(b) Find the root of the function :

$$f(x) = 3x^2 - \cos x - e^{-x}$$

using Newton-Raphson method.

(c) Evaluate the following integral :

$$I = \int_1^6 (3 + 2x)^{1/2} dx$$

using Simpson rule.