Printed Pages : 3 TMT701

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

PAPER ID : 0420 Roll No.

B.Tech

(SEM VII) ODD SEMESTER THEORY EXAMINATION 2009-10

CAD & CAM

Time : 3 Hours] *[Total Marks : 100*

Note : *(i) Attempt* ***all*** *questions.*

(ii) Assume any missing ***data*** *suitably.*

(iii) Be precise in your answer.

1 Attempt any **four** parts of the following : 5×4=20

(a) Explain various aspects of computer aided design. List your reasons to implement CAD into industries.

(b) Briefly explain the product cycle in a computerised manufacturing environment.

(c) Describe the various display devices that are used for displaying graphic informations.

(d) Explain the functioning of a central processing unit with a block diagram.

(e) Write a short note on various storage devices.

(f) Explain the principle of numerical control.

2 Attempt any **four** parts of the following : **5×4=20**

(a) What are the limitations found in general wireframe modeling systems. Explain with an example.

(b) Discuss in brief the various types of sweep techniques available in 3D geometric construction.

(c) Explain the concept of any **two** boolean operation in solid modeling. Give neat sketches to show the effect of these operators on a basic primitive.

(d) Find the reflection matrix when the axis of reflection is a line :

$$y=\frac{1}{\sqrt{2}}x$$

(e) Find the rotation matrices in x, y and z direction for 3D rotation.

(f) Write a short note on 3D geometric representation techniques.

3 Attempt any **two** parts of the following : **10×2=20**

(a) Generate a Bezier curve using the following control points : (2, 0), (4, 3), (5, 2), (4, -2), (5, -3) and (6, -2).

(b) What is a spline representation ? What are the advantages of B-spline over Bazier splines ? Differentiate between uniform and periodic B-splines.

(c) A circular shaft is subjected to a torque of 5000 N-m and a bending moment of 4000 N-m. If the material of shaft has an ultimate tensile stress of 560 MPa and ultimate shear stress of 420 MPa, determine the diameter of the shaft. Take a factor of safety of 4.

4 Attempt any **two** parts of the following : **10×2=20**

(a) What are the diferent modes in which a numerical controller can function ? List out the advantages and limitations of NC.

(b) Explain the function of 'preparatory functions'. Give the functioning of any **two** G codes used for the purpose.

(c) Discuss the method used for specifying the tool specification in a CNC part program. How is the tool length compensation specified in a machining center ?

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

(a) Explain the functioning of direct numerical control of a machining system. What are its advantages ?

(b) Briefly explain the following process control strategies :

(1) Feedback control

(2) Regulatory control

(3) Feed forward control

(4) Adaptive control

(c) Compare between the distributed control and central control. Explain centralized control and optimally distributed control with help of block diagrams.
