

V-Ex-07-1-4

Lib.

ME (Mech) MLC Design IV  
Pr DC Rev  
Comp. Aided Design & Mgt

09106/02

2-6 file 1

Con. 3291-07.

(REVISED COURSE)

BB-1687

(4 Hours)

[Total Marks : 100

N.B. : (1) Question No. 1 is compulsory.  
(2) Attempt any four questions from the rest.

1. (a) Develop a transformation matrix on alignment of vector  $V = i + j + k$  with the vector  $K$ . Draw suitable diagram to explain the process of transformation. 10
- (b) Find a transformation which aligns the vector  $V = i + j + k$  with the vector  $N = 2i - j - k$ . 10
2. (a) Find the general form of transformation  $N$  which maps a rectangular window with x extent  $X_{wmin}$  to  $X_{wmax}$  in the x direction and y extent  $Y_{wmin}$  to  $Y_{wmax}$  in the y direction in to a rectangular viewport with x extent  $X_{vmin}$  to  $X_{vmax}$  and y extent  $Y_{vmin}$  to  $Y_{vmax}$ . 10
- (b) With the help of neat diagrams explain line clipping and polygon clipping algorithms. 10
3. Develop an interactive object oriented program for the design of any of the machine element like gear, brake, clutch, cam etc. 20
4. (a) Distinguish clearly between mass, batch and jobbing shop production. 6
- (b) (i) What do you understand by the term 'extended enterprise' ? 6
- (ii) Explain Structured Query Language (SQL) with reference to design database. 8
5. (a) Are there any design circumstances in which concurrent engineering would not be appropriate ? Why is it particularly appropriate for the development of designs for products that are mass produced ? 10
- (b) Why do you think small improvements (in a continuous improvement) are a better way to quality than large leaps ? 10
6. (a) Explain Z-buffer algorithm and develop a computer program for the same. 10
- (b) (i) Determine the parametric representation of a right circular cylinder. 5
- (ii) Explain any shading algorithm. 5
7. Write notes on the following :— 20
  - (a) Design for assembly and design for manufacturing.
  - (b) Bezier curves
  - (c) 'Variant' and 'Generative' process planning
  - (d) Group technology
  - (e) NC machines and part programming.