N.B.: (1) Question No. 1 is **compulsory**.

(2) Attempt any **three** questions from remaining **five** questions.

(3) Clearly mention the **assumption** made if any.

(4) **Figures** to the **right** indicate **full** marks.

Q1. Solve **Any four**   (20)

(a) Explain Product life cycle with CAD overlay.   (05)

(b) Discuss the Properties of Bezier and B-spine curves   (05)

(c) What is B- rep and CSG type solid modelling? Explain with example.   (05)

(d) Differentiate Linear and Circular interpolation.   (05)

(e) Explain GT.   (05)

Q2. (a) A square with an edge length of 10 units is located on the origin with one of the edge at an angle   (12)
of 30^0 with the +X axis. Calculate the new position of the square if it is rotated by an angle 30^0 in
the clockwise direction.

(b) Explain the advantages of canned cycle with proper example.   (08)

Q3. (a) Find out the raster locations by Bresenham's algorithm for the end points of a straight   (08)
line (20,10), (30,18)

(b) Explain Motion control system in CNC.   (06)

(c) What is product data exchange? List data exchange formats available in the market. Explain DXF (06)
data exchange format.

Q4. (a) Explain in brief Axis drives.   (05)

(b) Explain the Pro's and Cons of CNC machines.   (05)

(c) 1) AVG   2) Benefits of CIM.   (10)

Q5. (a) Describe touch probe system used in CNC machining centre. (06)

(b) Write a part program using APT. The component is 5mm thick .The speed and feed (14)
are 700 rpm and 80 mm/min respectively.
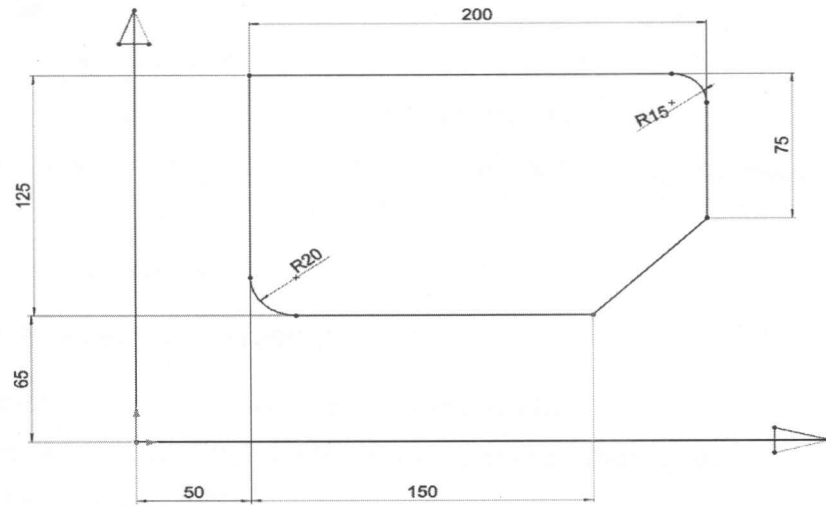
Q6. a. Figure show cluster of springs. Using the finite element method, determine: (14)
   a) The deflection of each spring.
   b) The reaction forces at supports.
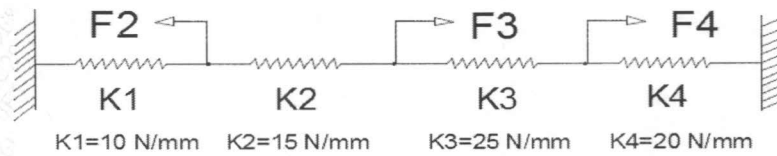
$$F2 = 20 \text{ N} \quad F3 = 30 \text{ N} \quad F4 = 50 \text{ N}$$

b. What is the importance of hardware integration and networking in the computer – aided (06)
manufacturing environment?

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