P P SAVANI UNIVERSITY

Sixth Semester of B. Tech. Examination
December 2022
SEME3080 Computer Aided Design and Manufacturing

26/11/2022, Saturday

Time: 01:00 p.m. To 03:30 p.m.

Maximum Marks: 60

Instructions:
1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

|			CO	BTL
Q - 1	Enlist the various methods of geometric modeling. Discuss wire frame modeling in detail.	[05]	1	3
	OR			
Q - 1	Draw a flow chart for DDA Algorithm	[05]	1	3
Q - 2	A triangle ABC with vertices A (40, 30), B (110, 40) and C (50, 100) is to be scaled by factor 0.5 about a point X (70, 50). Determine: (i) the composition matrix and (ii) the coordinates of the vertices for a scaled triangle.	[07]	2	4
	OR			
Q - 2	A triangle KLM with vertices K (3, 7), L (7, 8) and M (5, 9) is to be reflected about a line x =2y – 6. Determine,	[07]	2	4

(i)   The concatenated matrix and
(ii)   The coordinates of the matrices for the reflected triangle.

| Q - 3	A Bezier curve is to be constructed using control points X (35, 30), Y (25, 0), M (15, 25) and N (5,10). The Bezier curve is anchored at X and N. Find the equation of the Bezier curve and plot the curve for u= 0, 0.2, 0.4, 0.6, 0.8 and 1.	[08]	2	4
	OR			
Q - 3	Three Points H(4,6) D(10,8) & P(12,3) is plotted on the Graph. Find the equation for the two dimensional Hermit cubic Spline that connects points H & D and that is tangent to lines H,P & P,D. Calculate & Plot ten points on the curve.	[08]	2	3
Q - 4	For the spring assemblages shown in below Figure, determine the nodal displacements, the forces in each element, and the reactions.	[10]	3	4

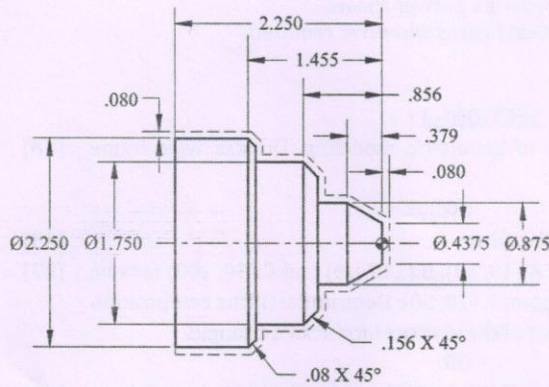| Q - 4	For the spring assemblages shown in below Figure, determine the nodal displacements, the forces in each element, and the reactions.	[10]	3	4

400 N/m   100 N   400 N/m   200 N
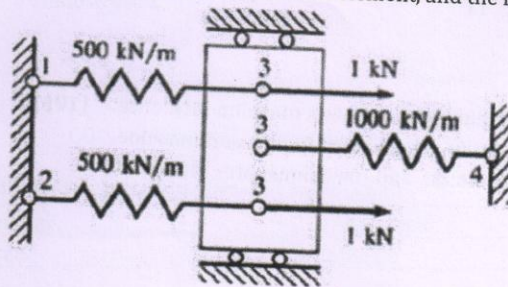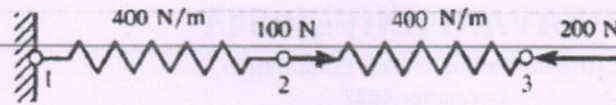
SECTION – II

Q - 1 Write a CNC program using appropriate G and M code to turn component as shown in figure. Cutting speed V = 40 m/min and feed=0.1, Assume suitable data for depth of cut. **[10]** 4 5

OR

Q - 1 Write a CNC program using appropriate G and M code to turn component as shown in figure. Cutting speed V = 40 m/min and feed=0.1, Assume suitable data for depth of cut. **[10]** 4 5
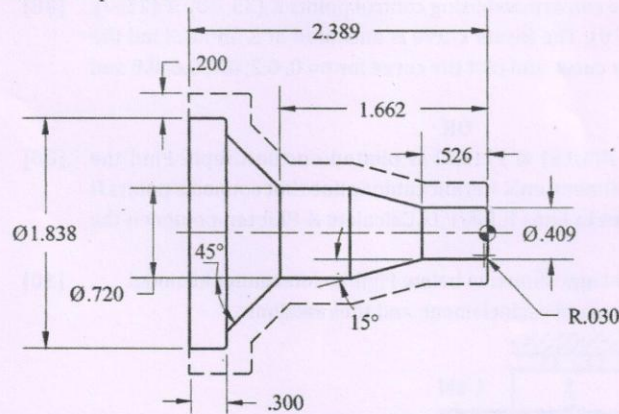

Q - 2 Apply the rank order clustering technique to the part-machine incidence matrix in the following table to identify logical part families and machine groups. Parts are identified by letters, and machines are identified numerically. **[10]** 5 4

	Parts					
Machines	A	B	C	D	E	F
1	1				1	
2				1		1
3	1	1				
4			1	1		
5		1			1	
6			1	1		1

OR

Q - 2   Write a CNC program using appropriate G and M code to turn component as shown in figure. Cutting speed V = 40 m/min and feed=0.1, Assume suitable data for depth of cut.   [10]   5   5

RH Square-Thread
Pitch = 2mm

R 20   R 12

28   18   29   15

10   15   18   10   10   18   10
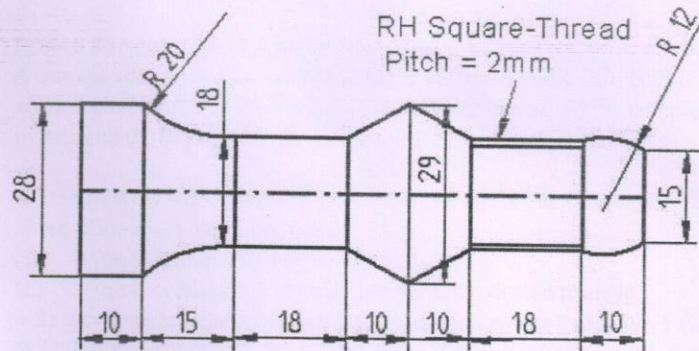
Q - 3 (a)   Define Group Technology (GT). State the main two hurdles in its implementation. Enlist various benefits of GT implementation in the industry.   [05]   5   4

Q - 3 (b)   Discuss the fundamentals of Rapid Prototyping, Advantages and Applications of RP   [05]   5   3

OR

Q - 3 (a)   What are the objectives of CIM? Which major functional areas of the manufacturing enterprise considered for achieving CIM objectives?   [05]   5   3

Q - 3 (b)   Justify the need of Computer Aided Manufacturing in today's era of Industry 4.0.   [05]   5   3

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CO   : Course Outcome Number   BTL   : Blooms Taxonomy Level

Level of Bloom's Revised Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create