	B. M.S. COLLEGE OF ENGINEERING, BANGALORE-19 (Autonomous Institute, Affiliated to VTU) **Department Name: CSE**
Third INTERNALS – Online	
Course Code : 20CS5PEAAG	**Course Title : Advanced Algorithms**
Semester :5th	**Maximum Marks: 40** **Date: 6-01-2021**
Faculty Handling the Course:	NN,GRP
Instructions: ***Internal choice is provided in Part C.***	

PART-A

Total 5 Marks (No choice)

No.	Question	Marks	CO No.	Level
1a	Describe the Jarvis's march technique of computing the convex hull.	5M	3	2

PART-B

Total 15 Marks (No Choice)

No.	Question	Marks	CO No.	Level
2a	Convert the below LPP to standard form Minimize : 8 x+7y Subjected to: 4x+2y > =20 -6x+4y<=6 x+y>=4 2x-4=2 With non negativity constraint : x,y>=0	5M	2	3
2b	How does using the cross product help in determining if a point is in clockwise/counter clockwise from another point? Show with an example.	5M	3	3
2c	A baker bakes two types of cakes: cake A and cake B. He requires for baking: Cake A – 1units of butter and 3 units of flour Cake B – 1units of butter and 2 units of flour Totally he has 5units of butter and 12 units of floor in store. He makes a profit of Rs 6 for each cake A sold and Rs 5 for each cake B sold. Given the above linear programming problem, determine the expressions for constraints and objective in order to maximize the profit.	5M	1	3

PART- C

Total 20 Marks (Choice)

No.	Question	Marks	CO No.	Level
3a	Solve the below LPP using Simplex method. Maximize $3x_1+x_2$ Subject to: $x_1+x_2 \leq 30$ $2x_1+2x_2 \leq 24$ $4x_1+x_2 \leq 36$ With non negativity constraint : $x_1, x_2 \geq 0$	**10M**	**2,3**	**2,3**
	OR			
3b	Solve the below LPP using Simplex method. Maximize $2x_1+x_2+3x_3$ Subject to: $x_1+x_2+3\,x_3 \leq 36$ $2x_1+2x_2+5x_3 \leq 12$ $2x_1+x_2+4x_3 \leq 48$ With non negativity constraint : $x_1, x_2, x_3 \geq 0$	**10M**	**2,3**	**2,3**
4a	Apply Graham scan algorithm to find convex hull for the points : {(0,0), (4,4), (0,3), (1,2),(3,1),(3,3)}	**10M**	**2,3**	**2,3**
	OR			
4b	Design pseudo code/ program for checking whether a pair of line segments intersects or not. Apply the same to check line segment (p1,p2) intersects with(p3,p4). P1=(15,10) P2=(45,25), P3=(20,35) and p4=(30,10)	**10M**	**2,3**	**2,3**