DATTA MEGHE COLLEGE OF ENGINEERING
Department of Artificial Intelligence & Data Science
Internal Assessment

Academic Year: 2024-25   Semester: ODD

Sub: Engineering Mathematics - III	Sem: III	Year/Div: SE (A & B)	Roll No.:
Time: 1 Hour	Subject Code: CSC301		Total Marks: 20

Note: Assume data wherever necessary.

CSC 301.1	Understand the concept of Laplace transform and its application to solve the real integrals in engineering problems.
CSC 301.2	Understand the concept of inverse Laplace transform of various functions and its applications in engineering problems.
CSC 301.3	Expand the periodic function by using the Fourier series for real-life problems and complex engineering problems.
CSC 301.4	Understand complex variable theory, application of harmonic conjugate to get orthogonal trajectories and analytic functions.
CSC 301.5	Apply the concept of Correlation and Regression to the engineering problems in data science, machine learning, and AI.
CSC 301.6	Understand the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.

Q.N.	Question	Marks	CO	BT
1.a	Find the Laplace Transform of function : $Cosh^5 t$	05	CSC 301.1	L3
	OR			
1.b	Find $L\left[\frac{d}{dt}\left(\frac{\sin 3t}{t}\right)\right]$	05	CSC 301.1	L3
2.a	Evaluate $\int_0^\infty e^{-t}\left(\frac{\cos 3t - \cos 2t}{t}\right)dt$ using Laplace Transform.	05	CSC 301.1	L5
	OR			
2.b	Evaluate $\int_0^\infty e^{-t}t\sqrt{1+\sin t}\,dt$ using Laplace Transform.	05	CSC 301.1	L5
3.a	Find : $L^{-1}\left[\frac{s-2}{s^2-4s+5}\right]$	05	CSC 301.2	L3
	OR			
3.b	Find the inverse Laplace Transform of function : $\log\left[\frac{s^2-4}{(s-3)^2}\right]$	05	CSC 301.2	L3
4.a	Prove that $f(z) = (x^3 - 3xy^2 + 2xy) + i(3x^2y - x^2 + y^2 - y^3)$ is analytic and find $f'(z)$ and $f(z)$ in terms of z.	05	CSC 301.4	L2
	OR			
4.b	Find an analytic function whose real part is $(x^4 - 6x^2y^2 + y^4)$	05	CSC 301.4	L2

DATTA MEGHE COLLEGE OF ENGINEERING, AIROLI, NAVI MUMBAI
Department of Artificial Intelligence and Data Science
Internal Assessment - 1
Academic Year: 2024-2025   Semester: Odd

Sub: Discrete Structure & Graph Theory   Semester: III   Year/Div: SE   Roll No.:
Time: 1 Hour   Total Marks: 20
Note: Assume data wherever necessary.

CSC302.1	Understand the notion of mathematical thinking, mathematical proofs and to apply them in problem solving
CSC302.2	Ability to reason logically.
CSC302.3	Ability to understand relations, functions, Diagraph and Lattice.
CSC302.4	Ability to understand and apply concepts of graph theory in solving real world problems.
CSC302.5	Understand use of groups and codes in Encoding-Decoding
CSC302.6	Analyze a complex computing problem and apply principles of discrete mathematics to identify solutions

Q.N.	Question	Mark	CO	BT
1.a	Prove using Mathematical Induction that $2+5+8+\cdots+(3n-1) = n(3n+1)/2$	05	CSC302.1	L5
	OR			
1.b	Prove the following statement formula is DNF or CNF, solve by using Laws of Logic. $((p \to q) \wedge (q \to p)) \vee p$	05	CSC302.1	L5
2.a	Define Quantifier and its types. Explain with examples.	05	CSC302.2	L3
	OR			
2.b	Compute the truth table for the following expression and determine whether it is Tautology $(\neg P \wedge (\neg Q \wedge R)) \vee (Q \wedge R) \vee (P \wedge R) \leftrightarrow R$	05	CSC302.2	L3
3.a	Let R={(1,3),(4,2),(2,4),(2,3),(3,1) } be a relation on the A={1,2,3,4}. Find the transitive closure of R using Warshall's algorithm.	05	CSC302.3	L4
	OR			
3.b	f: R→ R is defined by $f(x) = x^3$ g: R→ R is defined by $g(x) = 4x^2 + 1$ h: R→R is defined by $h(x) = 7x-2$ Find the rule defining i) fog ii) (goh)of	05	CSC302.3	L4
4.a	Find the relation determined by the diagraph and give its matrix A = {1,2,3,4,5} R = { 1,2), (2,2), (2,3), (3,4), (4,4), (5,1), (5,4)}	05	CSC302.3	L6
	OR			
4.b	Draw Hasse diagram for D 72.	05	CSC302.3	L6

DATTA MEGHE COLLEGE OF ENGINEERING
Department of Artificial Intelligence and Data Science
Internal Assessment - I
Academic Year: 2024-2025   Semester: Odd

Sub: Data Structure   Semester: III   Year/Div: SE/ A and B   Roll No.:

Time: 1 Hour   Total Marks: 20

Note: Assume data wherever necessary.

CSC303.1	Students will be able to implement Linear and Non-Linear data structures.
CSC303.2	Students will be able to handle various operations like searching, insertion, deletion and traversals on various data structures.
CSC303.3	Students will be able to explain various data structures, related terminologies and its types.
CSC303.4	Students will be able to choose appropriate data structure and apply it to solve problems in various domains.
CSC303.5	Students will be able to analyze and implement appropriate searching techniques for a given problem.
CSC303.6	Students will be able to demonstrate the ability to analyze, design, apply and use data structures to solve engineering problems and evaluate their solutions.

Q.N.	Question	Mark	CO	BT
1.a	Distinguish between linear and nonlinear Data structure	05	CSC303.1	L2
	OR			
1.b	Explain various operations possible on Data structures	05	CSC303.1	L2
2.a	justify the statement with suitable example: "Circular queue overcome the disadvantages of linear queue".	05	CSC303.2	L5
	OR			
2.b	Evaluation and demonstrate postfix the same step by step for following expression a. 9 8 * 2 8 + -	05	CSC303.2	L5
3.a	Write a C program to check balanced parenthesis in an expression using Stack	05	CSC303.2	L3
	OR			
3.b	Write a program in 'C' to implement Stack. Perform the following operations: (i) Push (ii) Peek	05	CSC303.2	L3
4.a	Write a program to insert an element into linear queue using array	05	CSC303.2	L3
	OR			
4.b	Write a short note on priority Queue	05	CSC303.2	L3

DATTA MEGHE COLLEGE OF ENGINEERING
Department of Artificial Intelligence and Data Science
Internal Assessment - I
Academic Year: 2024-2025   Semester: Odd

Sub: DLCOA   **Semester: III**   **Year/Div:** SE-A/B   **Roll No.:**
Time: 1 Hour   **Total Marks: 20**
Note: Assume data wherever necessary.

CSC 304.1	To learn different number systems and basic structure of computer systems.
CSC 304.2	To demonstrate the arithmetic algorithms.
CSC 304.3	To understand the basic concepts of digital components and processor organization.
CSC 304.4	To understand the generation of control signals of computers.
CSC 304.5	To demonstrate the memory organization.
CSC 304.6	To describe the concepts of parallel processing and different Buses.

Q.N.	Question	Mark	CO	BT
1.a	1. Convert 1.$(563.21)_{10}$ to its equivalent Binary number and 2. $(1463.45)_{10}$ to its equivalent Octal number. 3.$(101001.111011)_2$ into its equivalent Decimal number 4. $(100011.110011)_2$ into its equivalent Hexadecimal number 5. $(237)_8$ into its equivalent Hexadecimal number	05	CSC304.1	L3
	OR			
1.b	Differentiate between Computer Organization and Computer Architecture.	05	CSC304.1	L3
2.a	Subtract the following binary numbers using 2's complement representation: i)(10101) - (01110). ii.) Multiply the following binary numbers using 1's complement representation: (1101) * (1010).	05	CSC304.2	L2
	OR			
2.b	What do you mean by BCD? Perform 179+128 using BCD addition.	05	CSC304.2	L2
3.a	using Booth's algorithm solve (-7) x (5)	05	CSC304.2	L3
	OR			
3.b	Represent 120.12 using IEEE754 standard using single precision and double precision format.	05	CSC304.2	L3
4.a	Solve 12 ÷6 using restoring algorithm.	05	CSC304.3	L4
	OR			
4.b	Construct mux 8: 1 with the help of suitable diagram & truth table	05	CSC304.3	L4

DATTA MEGHE COLLEGE OF ENGINEERING
Department of Artificial Intelligence and Data Science
Internal Assessment - I
Academic Year: 2024-2025   Semester: Odd

Sub: Computer Graphics   Semester: III   Year/Div: SE/A and B   Roll No.:
Time: 1 Hour   Total Marks: 20
Note: Assume data wherever necessary.

CSC305.1	Describe the basic concepts of Computer Graphics.	
CSC305.2	Demonstrate various algorithms for basic graphics primitives.	
CSC305.3	Apply 2-D geometric transformations on graphical objects.	
CSC305.4	Explore 3-D geometric transformations, curve representation techniques and projections methods.	
CSC305.5	Use various Clipping algorithms on graphical objects	
CSC305.6	Explain visible surface detection techniques and Animation	

Q.N.	Question	Mark	CO	BT
1.a	Explain Computer Graphics and give application of computer graphics.	05	CSC305.1	L2
	OR			
1.b	Give difference between Random Scan display and Raster Scan display.	05	CSC305.1	L2
2.a	Explain midpoint circle algorithm.	05	CSC305.1	L4
	OR			
2.b	Analyze the pixel positions along a line between A(1,1) and B(5,3) using bresenhams line drawing algorithm	05	CSC305.1	L4
3.a	Compare DDA and BRESENHAM line drawing algorithm.	05	CSC305.2	L4
	OR			
3.b	Explain aliasing and Antialiasing and describe any one antialiasing method	05	CSC305.2	L4
4.a	Plot the circle whose radius is 3 unit and center is at origin using midpoint circle algorithm.	05	CSC305.2	L3
	OR			
4.b	Rasterize the line from (5,5) to (10,9) using incremental differential Algorithm.	05	CSC305.2	L3