Roll No.	

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

Department of Computer Science and Engineering

S.Y.B.Tech In-Semester Examination-I, September- 2023

Course Name	:	**Data Structures**	Course Code:	**CSE303**
Day & Date	:	Wednesday, 27/09/2023	Max Marks :	**40Marks**
Time	:	9.15AM to 10.45AM		

Instructions:

i. All questions are compulsory

ii. Figures to the right indicate full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL) (**L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

iii. Assume suitable data if required

Course Outcomes:

CO1: Identify the appropriate data structure for a specific application

CO2: Identify the appropriate sorting and searching algorithms for a given problem size/datasets

		Marks	B. L	CO
Q.1	**Attempt any two**			
a)	Write a C program to implement Modified Linear Search to search an element ITEM from array DATA.	**7**	**L3**	
b)	Write a note on Primitive and Non-Primitive Data structures.	**7**	**L2**	CO2
c)	Explain the Merge Sort Algorithm (For sorting in Descending Order) with a suitable example. Comment on the complexity of the Merge sort	**7**	**L3**	
Q.2	**Attempt any two**			
a)	List the Algorithm Strategies. Elaborate on anyone with an appropriate example.	**7**	**L1**	
b)	Define Algorithm. Enlist the Characteristics of Algorithm	**7**	**L1**	CO1
c)	Enlist all the possible operations that can be performed on any data structure.	**7**	**L2**	
Q.3	**Attempt any two**			
a)	Write a c program to implement the Bubble Sort algorithm for sorting the array in descending order.	**6**	**L3**	
b)	Consider the following array DATA: 10, 15, 19, 25, 28, 33, 36, 39, 45, 50 Apply the Binary search algorithm to find the following items and their locations in DATA i. 45 ii. 8	**6**	**L4**	CO2
c)	Demonstrate the calculation of Best Case and Worst Case complexity of Selection Sort.	**6**	**L4**	

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Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

Department of Computer Science and Engineering

S.Y.B.Tech In-Semester Examination-II, October- 2023

Course Name : **Data Structures** Course Code: **CSE303**

Day & Date : **Wednesday, 28/10/2023** Max Marks : **40Marks**

Time : **9.15 to 10.45 AM**

Instructions:

i. All questions are compulsory

ii. Figures to the right indicate full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL) **(L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

iii. Assume suitable data if required

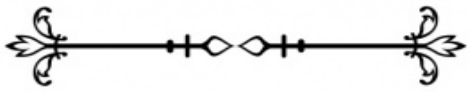
CO1 Identify the appropriate data structure for a specific application.

CO2 Identify the appropriate sorting and searching algorithms for a given problem size/dataset.

CO3 Outline the solution to the given software problem with appropriate data structure.

		Marks	B. L	CO
Q.1	**Attempt any two**			CO3
a)	Convert the following Infix expression to a Postfix expression using Stack. (Write each step of conversion) A + B * (C – D) \ E * F	**7**	**L5**	
b)	Evaluate the given postfix expression p: 5, 6, 2, +, *, 12, 4, /, -	**7**	**L5**	
c)	Illustrate the Algorithm for Implementation of Circular Queue.	**7**	**L3**	
Q.2	**Attempt any two**			CO1
a)	Consider the following instance of circular queue of length 4 Queue: 10 | 20 | 30 | Apply the following operations on the above circular queue, elaborate the state of queue at each step: 1. Enqueue 40 2. Enqueue 50 3. Dequeue 4. Dequeue 5. Enqueue 60 6. Enqueue 70 7. Enqueue 80	**7**	**L3**	

b)	Consider the following stack of city names: STACK: London, Berlin, Rome, Paris, _____, _____ Examine the stack contents as the following operations take place: 1. PUSH(STACK, Athens) 2. POP(STACK, ITEM) 3. POP(STACK, ITEM) 4. PUSH(STACK, Madrid) 5. PUSH(STACK, Moscow) 6. POP(STACK, ITEM)	**7**	**L3**	
c)	Write a C program to implement Stack using Array.	**7**	**L3**	
Q.3	**Attempt any two (Question C is Compulsory)**			
a)	List and Explain the Types of Queue with appropriate Diagrams	**6**	**L1**	
b)	Consider the following instance of a Linear queue of length 4 10 | 20 | 30 | Front Rear Apply the following operations on the above Linear queue, and elaborate on the state of the queue at each step: 1. Dequeue 2. Dequeue 3. Dequeue 4. Dequeue 5. Enqueue 60 6. Enqueue 70	**6**	**L3**	CO1 CO3
c)	Write a C Program to implement Linear Queue using Array	**6**	**L3**	



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SWVSM's

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

S. Y. B. Tech (Comp. Sci. & Engg.) (Semester-III)

End Semester Examination,December-2023

Course Name : Data Structures — Course Code: CSE 303

Day & Date : **Saturday, 23-Dec-2023** — Max Marks 60 Marks

Time : **2:00 pm to 4:00 pm**

Instructions:

a) All questions are compulsory

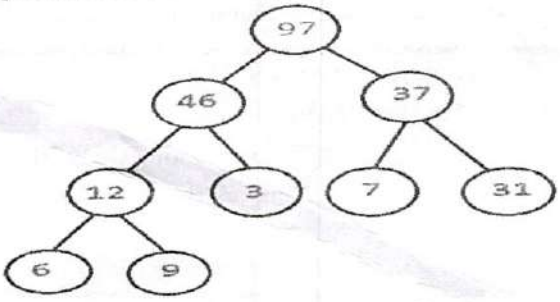
b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL)**(L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

c) Use of non-programmable calculator is allowed

d) Assume suitable data if required.

		Marks	B.L	CO
Q.1	**Attempt any two**	**12**		
a)	Define Algorithm. List the characteristics of Algorithms		**L1**	**CO1**
b)	Write a C program to implement Modified Linear Search to search an element ITEM from array DATA.		**L3**	**CO2**
c)	Sort the following sequence of numbers using Bubble Sort algorithm (Show all the steps of every pass). 55, 25, 50, 30, 5, 11		**L2**	**CO2**
Q.2	**Attempt any two**	**12**		
a)	Convert the following infix expression to postfix using stack **(a + b) * (c / d –e)** show the contents of the stack at every step of conversion.		**L5**	**CO3**
b)	Write algorithm for implementation of Circular Queue.		**L3**	**CO3**
c)	Write a C Program to implement the following operations onSingly Linked List (make all required declarations) Insert at End Delete at End Display		**L3**	**CO3**
Q.3	**Attempt any two**	**12**		
a)	Draw the BST for the given input: 10, 1, 5, 15, 10, 20, 2, 16, 7, 20, 2, 1 Write the Pre-order traversal of the BST.		**L6**	**CO3**

b) Insert 99 and 55 for the given Heap tree and perform one delete operation after inserting the above values. L4 CO3

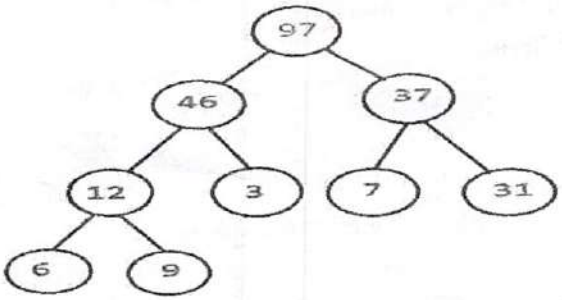


c) List and Explain Types of Binary Trees. L1 CO1

Q.4 **Attempt any two** 12

a) List and explain the terminologies of Grap. L1 CO1

b) Consider the graph below L4 CO3



Traverse the above graph using DFS considering 97 as the start node.

c) Show the Representation of the graph using the Adjacency matrix and Adjacency list. L2 CO1

Q.5 **Attempt any two** 12

a) List and explain various operations on Linear Queue. L1 CO1

b) Consider the following array DATA: L3 CO2

10,15,19,25,28,33,36,39,45,50

Apply the Binary search algorithm to find the following items and their locations in DATA

i. 45 ii. 8

c) List and explain the traversal techniques on Binary Tree. L2 CO1

d) List and Explain Applications of Graph. L2 CO1

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Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

Department of Computer Science and Engineering

S.Y.B.Tech In-Semester Examination-I, September- 2023

Course Name :-	Data Communication and Networks	**Course Code :-**	CSE304
Day & Date :-	Friday, 29-09-2023	**Max Marks :-**	40 Marks
Time :-	09:15 am to 10:45 am		

Instructions:

i. All questions are compulsory

ii. Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL) (**L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

iii. Use of non-programmable calculator is allowed iv. Assume suitable data if required

Course Outcome's (CO) are:

CO-1: To explain the basic concepts, components of data communication System and Transmission Media.

CO-2: To describe the basis and structure of an abstract layered protocol model and Network topologies

Q.1	**Attempt any two**	**Marks**	**B.L**	**CO**
a)	Explain Router and Switch with diagram.	**7**	**L1**	
b)	Discuss Transmission Impairments with suitable diagram in detail.	**7**	**L1**	**CO-1**
c)	Compare LAN,MAN,WAN.	**7**	**L1**	
Q.2	**Attempt any two**	**Marks**	**B.L**	
a)	List the various Topologies. Which one is the best topology without considering cost and mention some of the drawbacks and advantages for the same. Justify your answer.	**7**	**L2**	
b)	Define Bandwidth? If a periodic signal is decomposed into five sine waves with frequencies of 100, 300, 500, 700, and 900 Hz, what is its bandwidth? Draw the spectrum, assuming all components have a maximum amplitude of 10 V.	**7**	**L4**	**CO-2**
c)	A sine wave is offset 1/6 cycle with respect to time 0. What is its phase in degrees and radians?	**7**	**L4**	
Q.3	**Attempt All**	**Marks**	**B.L**	
a)	Draw and explain the Communication Model in detail.	**6**	**L1**	**CO-1**
	OR			
a)	Describe how the data flows while doing the communication between two devices.	**6**	**L2**	
b)	Explain the different terminologies used to represent signal by considering Phase, Amplitude and Frequency with example.	**6**	**L2**	
	OR			**CO-2**
b)	Define Transmission Medium. Enlist the broad categories of Transmission Media. Explain any one in detail in each category.	**6**	**L1**	

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Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

Department of Computer Science and Engineering

B. Tech In-Semester Examination-II, October- 2023

Course Name :	Data Communication and Network	Course Code:	CSE304
Day & Date :	Monday and 30/10/2023	Max Marks :	40Marks
Time :	9.15 am to 10.45 am		

Instructions:

i. All questions are compulsory

ii. Figures to the right indicates full marks,

iii. Course Outcome (CO) & Bloom's Taxonomy Level (BL) (**L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

iv. Use of non-programmable calculator is allowed v. Assume suitable data if required

Course Outcome's are:

CO1- Explain the basic concepts, components of data communication System and Transmission Media.

CO2- Describe the basis and structure of an abstract layered protocol model and Network topologies.

CO3- Understand the usability of different protocols and Standards.

CO4- Understand and apply the skills of subnetting and routing mechanisms.

		Marks	B.L.	CO
Q.1	**Attempt any Two**			
a)	What are the various protocols in application layer of TCP/IP? Explain them in short.	**7**	**L2**	**CO3**
b)	Compare OSI Model Vs TCP/IP Model.	**7**	**L1**	
c)	Draw and explain the OSI reference Model in detail.	**7**	**L2**	
Q.2	**Attempt any Two**			
a)	Brief about design issues of DLL. Explain Bit stuffing & Byte stuffing.	**7**	**L3**	**CO4**
b)	Explain polynomial concept and CRC division using polynomial	**7**	**L3**	
c)	Draw & Explain CRC Encoder & Decoder for C(7,4)	**7**	**L4**	
Q.3	**Attempt All**			
a)	Explain Unicast, Multicast & Broadcast Addressing with example.	**6**	**L2**	**CO3**
	OR			
a)	Define Protocol. Explain the Concept of Layered Architecture with Neat Diagram.	**6**	**L1**	
b)	What are the Types of Errors? Explain Detection Vs Correction.	**6**	**L4**	
	OR			**CO4**
b)	Sender wants to send 7, 11, 12, 0, 6 then what will be the check sum values at sender's side and receiver's side?	**6**	**L4**	

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Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

S.Y.B.Tech.(Comp. Sci. and Engg.) (Sem-III)

End Semester Examination, December- 2023

Course Name : Computer Networks — Course Code: CSE 402

Day & Date : **Friday, 15-Dec-2023** — Max Marks : 60 Marks

Time : **2:00 pm to 4:00 pm**

Instructions:

a) All questions are compulsory

b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL) **(L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

c) Use of non-programmable calculator is allowed

d) Assume suitable data if required.

			Marks	B.L	CO
Q.1		**Attempt any two**	**12**		
	a)	What are the various applications of TCP.		**L1**	**CO 1**
	b)	Draw and explain UDP Header Format.		**L1**	
	c)	Explain various types of domains.		**L2**	
Q.2		**Attempt any two**	**12**		
	a)	What is NVT? Explain its concept along with NVT Character sets?		**L1**	**CO 2**
	b)	Draw and illustrate format of HTTP request message.		**L2**	
	c)	Illustrate FTP data Connection and control connection with suitable diagrams.		**L1**	
Q.3		**Attempt any two**	**12**		
	a)	What is Socket. Explain socket interface.		**L2**	**CO 4**
	b)	Explain Client Server model.		**L1**	
	c)	Write in brief about Multiprotocol Servers.		**L2**	
Q.4		**Attempt any two**	**12**		
	a)	Define firewall. Explain types of firewalls.		**L4**	**CO 3**
	b)	Write in brief about PGP.		**L1**	
	c)	Explain AH and ESP protocol with suitable diagram.		**L2**	
Q.5		**Attempt any two**	**12**		
	a)	What is Congestion control and what are the various prevention policies.		**L1**	**CO 1** **CO 2**
	b)	Define and explain following terms of DNS 1. FQDN 2.Zone 3. Primary and Secondary Server		**L2**	**CO4**
	c)	What is anonymous FTP?		**L2**	
	d)	Compare the feature and functionalities between POP3 and IMAP4 protocols		**L4**	

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Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

Department of Computer Science and Engineering

S. Y. B. Tech In-Semester Examination-I, September- 2023

Course Name :	**Discrete Mathematical structures**	Course Code:	**CSE-302**
Day & Date :	Tuesday, 26/09/2023	Max Marks :	40Marks
Time :	9:15 am to 10:45 am		

Instructions:

i. All questions are compulsory

ii. Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL) (**L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

iii. Use of non-programmable calculator is allowed iv. Assume suitable data if required

Course Outcome's are:

CO1- Define the concepts of propositional logic, set theory and graph theory.

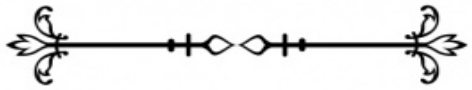
CO2-Classify relations, functions, lattice and algebraic systems based on their properties.

CO3- Apply the basic concepts of Sets, Boolean algebra and Graphs to represent structures, logic design in digital computer and to solve basic computer science problems respectively.

		Marks	B.L	CO
Q.1	**Attempt any two**			
a)	Define a proposition with an example. Explain the difference between Inclusive and Exclusive OR with truth tables	**7**	**L1,L2**	
b)	Define the Power Set. Write the power set of X={{}, a, b,{c}}	**7**	**L1,L2**	**CO1**
c)	State the following with example 1. Well-formed formulas 2. Duality Law and Duality Theorem 3. Functionally complete set of connectives	**7**	**L1**	
Q.2	**Attempt any two**			
a)	Prove the following without constructing the truth table **1. (P v Q) ^ (P -> R) ^ (Q - >R) ==> R** **2. ~ (P ^ Q) --> (~ P v (~P v Q)) <=> (~ P v Q)**	**7**	**L3**	**CO1**
b)	Write a **AxBxC** and $\mathbf{B^3}$ of A{1}, B={a, b} and C={2,3,4}	**7**	**L3**	
c)	Given S= {a1, a2, a3, …., a8}, give a subset represented by B18 & B34. Also designate the subsets {a2,a6,a7} and {a1,a8}	**7**	**L3**	

Q.3 Attempt any two

a)	Express P→ (~P→Q) in terms of ↑ only.	**6**	**L3**	**CO3**
b)	((~P --> Q) -> (Q->P)) verify the truth value of the formula (Tautology or Contradiction)	**6**	**L4**	
c)	"If Jerry takes calculus the ken takes sociology". Write the symbolic form of the proposition and write its **converse, inverse and contrapositive**	**6**	**L3**	



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Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

Department of Computer Science and Engineering

S. Y. B. Tech In-Semester Examination-II, October- 2023

Course Name :	Discrete Mathematical Structures	Course Code:	CSE302
Day & Date :	**27/10/2023**	Max Marks :	40 Marks
Time :	**9:15 am to 10:45 am**		

Instructions:

i. All questions are compulsory

ii. Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL) (**L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

iii. Use of non-programmable calculator is allowed

iv. Assume suitable data if required

CO2 : Classify relations, functions, lattice and algebraic systems based on their properties.

CO3: Apply the basic concepts of Sets, Boolean algebra and Graphs to represent structures, logic design in digital computer and to solve basic computer science problems respectively.

		Marks	B.L	CO
Q.1	**Attempt any two**			
a)	Show that the relation R on a set N such that R={<x, y> | x + y is even and x and y belongs to N} is reflexive, symmetric and transitive	**7**	L2	
b)	Construct the Hasse diagram for {1,2,3,4,6,8,12,24} and find i) All lower bounds of (8,12) ii)All upper bounds of (6,12) iii) Find GLB and LUB of (4,8,12)	**7**	L2	CO2
c)	Explain the following with example i) Clock Algebra ii)Semigroup and Monoid iii) Homomorphism of Algebraic System	**7**	L1	
Q.2	**Attempt any two**			
a)	Define Equivalence Relation. Prove that every equivalence relation creates a partition on a set.	**7**	L2	
b)	Let Zn denotes set of all integers {0,1,2,...,n-1} and ⊙ be a binary operation on Zn such that for any a,b □ Z a⊙b= the remainder of (a X b) divided by n i) construct the table for the operation ⊙ for n=4 ii) Show that < Zn, ⊙> is a semigroup for any n	**7**	L3	CO3

c) Define the composition of the function. Let f:Z→Z be function defined by f(x)=$2\square + 3$ and g(x)=$3\square^2 + 2$. Find **fog, gof** and **gog** — **7** — L3

Q.3 Attempt any two

a) Draw the graph of relation R={<1,1>,<1,3>,<2,1>,<2,3>,<2,4>,<3,1>,<3,4>,<4,1>}on set X={1,2,3,4}. Also find the properties of the relation — **6** — L2

b) Let R be the relation represented by a matrix — **6** — L2 — CO2

$$M(R)=\begin{matrix}0&1&1\\1&1&0\\1&0&1\end{matrix}$$

Find $\square^{-1}$ and $\square^2$

c) Construct the Composition table for <Z6, X6> and specify the properties of the given system — **6** — L2

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Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

S.Y.B.Tech.(Comp. Sci. and Engg.) (Sem-I)

End Semester Examination,December-2023

Course Name : Discrete Mathematics & Structures — Course Code: CSE302

Day & Date : **Thursday, 21-Dec-2023** — Max Marks 60 Marks

Time : **2:00 pm to 4:00 pm**

Instructions:

a) All questions are compulsory

b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL)**(L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

c) Use of non-programmable calculator is allowed

d) Assume suitable data if required.

			Marks	B.L	CO
Q.1	**Attempt any two**		**12**		
a)	Show the following without using truth table			**L5**	
	i)	$(P \rightarrow C) \wedge (Q \rightarrow C) \Leftrightarrow (P \vee Q) \rightarrow C$			
	ii)	$(P \wedge Q) \Rightarrow (P \rightarrow Q)$			
	iii)	$(P \leftrightarrow Q) \Leftrightarrow (P \wedge Q) \vee (\sim P \wedge \sim Q)$			**CO1**
b)	Explain the following terms in short			**L1**	
	i)	Functionally complete set of connectives			
	ii)	Relative and Absolute complement			
	iii)	Inclusion and belongingness in a set			
c)	Prove that $(A \cap B) \cup C = A \cap (B \cup C)$ if and only if C is subset of A			**L4**	
Q.2	**Attempt any two**		**12**		
a)	Define Bijective function. Show that the functionf: R -> R , $f(x) = x^3 - 2$ is one – one and onto both. Findit's inverse if it exists.			**L5**	
b)	Find all non -trivial subgroups of $<Z_6, +_6>$			**L5**	
c)	For the given functions $f(x) = 2x$ and $g(x) = x^2 + 1$. Find out the values of $f(g(x))$ and $g(f(x))$ at $x=2$.				**CO2**
Q.3	**Attempt any two**		**12**		
a)	Find the product of sums (POS) canonical forms in **three variable** Boolean expression (x1*x3)			**L5**	
b)	Let L1={1,3,9} and L2={1,2,4} be two lattices. Find (L1 x L2)			**L5**	**CO3**
c)	Write a note on Complemented and Distributive Lattice.			**L2**	
Q.4	**Attempt any two**		**12**		
a)	Give the adjacency matrix and path matrix of following graph			**L3**	**CO3**

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Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

Department of Computer Science and Engineering

S.Y.B.Tech In-Semester Examination-I, September- 2023

Course Name :	**Digital System and Microprocessor**	Course Code:	**CSE-305**
Day & Date :	Saturday, 30/09/2023	Max Marks :	40Marks
Time :	9:30 am to 10:45 am		

Instructions:

i. All questions are compulsory

ii. Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL)

(**L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

iii. Use of non-programmable calculator is allowed iv. Assume suitable data if required

Course Outcome's are:

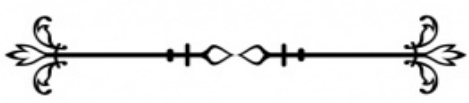
CO1-Realize the combinational logic circuits by using various logical blocks

CO 2- Apply different simplification tools for Boolean functions and design the logic circuits

CO3 -.Understand the architecture of the 8086 processor and to use the tools for programming

CO4 -Apply the assembly language programs to develop and execute the different application

		Marks	B.L	CO
Q.1	**Attempt any two**			
a)	Perform the following Conversions. A. Hexadecimal to Decimal CAFÉ.24 and A69.8 B. Binary to Octal and Hex 1011100.11 and 11110000	**7**	**L3**	**CO1.**
b)	State and Prove Demargon's Theorem.	**7**	**L2**	
c)	Simplify the expression $A[B + \bar{C}\,(\overline{AB + A\bar{C}}\,)]$	**7**	**L3**	
Q.2	**Attempt any two**			
a)	Design a logic circuit that has three input A,B, and C , and whose OUTPUT will be HIGH only when a majority of inputs are HIGH.	**7**	**L3**	**CO2**
b)	Simply using K-Map Y(A,B,C,D) =∑(1,3,4,5,6,7,12,15)	**7**	**L4**	
c)	What is Parity? Explain Even parity generator and checker.	**7**	**L1**	
Q.3	**Attempt any two**			
a)	List the universal gates .Why it is called as universal gates and explain any one	**6**	**L2**	**CO1**
b)	Describe the single variable theorems	**6**	**L1**	
c)	Explain the Exclusive- OR and Exclusive NOR Gate with Timing diagrams.	**6**	**L1**	



Roll No.	

SWVSM'S

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

Department of Computer Science and Engineering

S.Y.B.Tech In-Semester Examination-II, October- 2023

Course Name : **Digital System and Microprocessor** Course Code: **CSE-305**

Day & Date : Tuesday, 31/10/2023 Max Marks : 40Marks

Time : 9:15 am to 10:45 am

Instructions:

i. All questions are compulsory

ii. Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL)

(**L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

iii. Use of non-programmable calculator is allowed iv. Assume suitable data if required

Course Outcome's are:

CO1-Realize the combinational logic circuits by using various logical blocks

CO 2- Apply different simplification tools for Boolean functions and design the logic circuits

CO3 -.Understand the architecture of the 8086 processor and to use the tools for programming

CO4 - Apply the assembly language programs to develop and execute the different application.

		Marks	B.L	CO
Q.1	**Attempt any two**			**CO3.**
a)	What is Microcomputer? Draw and Explain the Architecture of typical microcomputer.	**7**	**L3**	
b)	Describe 8086 CPU architecture.	**7**	**L2**	
c)	Calculate the physical address for the following i. DS=5F00H and SI=3CB0H ii. CS=4D00H and IP=2FF0H	**7**	**L3**	
Q.2	**Attempt any two**			**CO2**
a)	Perform the Hexadecimal addition and subtraction A. ACE+EBA B. ACE-651	**7**	**L3**	
b)	Perform the following operations using 2's complement 8 bits form. i Subtract - 46 from -15 ii. Add +30 to -24	**7**	**L4**	
c)	Perform BCD Addition i. 542+625 ii. 2875+1089	**7**	**L3**	
Q.3	**Attempt any two**			**CO3**
a)	Draw and Explain the FLAG Registers of 8086	**6**	**L2**	
b)	What is Shift Register? Draw and explain SISO.	**6**	**L2**	
c)	Enlist the difference between Asynchronous and synchronous counter	**6**	**L2**	

Seat No:

SWVSM's

TatyasahebKore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

S.Y.B.Tech.Comp. Sci. and Engg.Sem-III

End Semester Examination,December-2023

Course Name :	Digital Systems and Microprocessors	Course Code:	CSE305
Day & Date :	**Friday, 29-Dec-2023**	Max Marks :	60 Marks
Time :	**2:00 pm to 4:00 pm**		

Instructions:

a) All questions are compulsory

b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL)**(L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

c) Use of non-programmable calculator is allowed

d) Assume suitable data if required.

		Marks	B.L	CO
Q.1	**Attempt any two**	**12**		
a)	Convert the following. i.$(37FD)_{16} = (\ )_{10}$ ii.$(919)_{10} = (\ )_{16}$ iii. $(11111111)_2 = (\ )_{10}$			**CO3**
b)	Simplify the followingBoolean expression and implement using basic gates. $Z = ABC + A\bar{B}.(\overline{\bar{A}\bar{B}})$			
c)	Perform the following operations using 2s complement in 8 bit form. A. Add +55 and -125 B. Sub -48 from -58			
Q.2	**Attempt any two**	**12**		
a)	State and prove Demorgan's Theorem.			
b)	Draw and explain SR flip flop with timing diagram			**CO1**
c)	Design a combinational logic circuit that has 3(A, B, C) inputs and one output (Z), the specified as follows Z=0 when the input less than 5 otherwise Z=1.			

Q.3		**Attempt any two**	**12**	
	a)	What is Segmentation? Enlist the advantages of segmentation and draw the diagram for overlapping and non-overlapping segmentation.		
	b)	Draw and explain the 8086 CPU architecture		**CO2**
	c)	Calculate the physical address for the following addresses. i. CS = 3AB7C IP = 123B ii. DS = 5D8E4 SI = 346C		
Q.4		**Attempt any two**	**12**	
	a)	Write an 8086 assembly language program to find out the count of even number and odd number in an array.		
	b)	Explain logical shift and rotate instructions with one example each.		**CO4**
	c)	Define string? Explain any 4 string manipulation instructions.		
Q.5		**Attempt any two**	**12**	
	a)	Solve using k map $f(A,B,C,D) = \sum m(0,2,5,7,9,11)+d(3,8,10,12,14)$		
		OR		**CO3**
	a)	What is counter? Design 2 bit synchronous up counter using JK Flip flop.		
	b)	What is addressing mode? List addressing modes of 8086 and explain any three with example.		
		OR		
	b)	Write an 8086 assembly language program for 8bit addition and assume necessary data and write the output.		**C04**

Roll No.	

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

Department of Computer Science and Engineering

S.Y.B.Tech In-Semester Examination-I, September- 2023

Course Name : Mathematics for Computer Science Course Code: CSE301

Day & Date : **Monday, 25 September 2023** Max Marks : 40Marks

Time : **9:15 am to 10:45 am**

Instructions:

i. All questions are compulsory

ii. Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL) (**L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**

iii. Use of non-programmable calculator is allowed

Course Outcome's: CO1-Describe and interpret the statistical data numerically by using statistical methods.
CO2-Solve basic problems in probability theory, including problems involving the binomial, Poisson, and normal distributions
CO3-Define fuzzy sets using linguistic words and represent these sets by membership functions, convexity, Normality, support, etc.
CO4-Find roots of algebraic and transcendental equations using numerical methods.

		Marks	B.L	CO
Q.1	**Attempt any two**			
a)	Find mean, median and mode of the following distribution	**7**	**L2**	

Age in Years	0 -10	10-20	20-30	30-40	40-50	50-60	60-70
No. of persons	10	12	14	20	14	12	10

b)	Using method of grouping, find the mode of the following frequency distribution	**7**	**L3**	**CO1**

Marks	0 -10	10-20	20-30	30-40	40-50	50-60	60-70
No. of students	15	25	52	56	78	80	70

c)	Find the mean deviation from mean for the following data	**7**	**L2**	

x	0	1	2	3	4	5	6	7	8	9	10	11	12
f	15	16	21	10	17	8	4	2	1	2	2	0	2

Q.2	**Attempt any two**				
a)	Followings are scores of two batsman A and B in a series of innings. Find out who is more consistent.	**7**	**L4**		

A	18	16	15	12	10	5	2
B	10	12	14	32	29	11	3

b)	Find Karl Pearson's coefficient of correlation between x and y	**7**	**L2**	**CO1**

x	10	12	14	15	16	17	18	10	14	15
y	17	16	15	12	10	9	8	15	13	12

c) the following data obtain the two regression equations **7** **L2**

x	6	2	10	4	8
y	9	11	5	8	7

Q.3 Attempt any two

a) Find Coefficient of correlation from the following information **6** **L2**

$n=10, \Sigma x=140, \Sigma y=150, \Sigma(x-10)^2=180,\ \Sigma(y-15)^2=215,$ and $\Sigma(x-10)(y-15)=60$

b) Explain how correlation can be studied with the help of Scatter diagram method? **6** **L1** **CO1**

c) From the data given below **6** **L2**

	Series x	Series y
Mean	36	85
Standard Deviation	11	8

If correlation coefficient between y and x is 0.66, calculate the value of x if y = 75 using appropriate line of regression.

Seat No.	

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Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

S. Y. B. Tech (Comp. Sci. & Engineering) (Semester-III)

End Semester Examination, December- 2023

Course Name : Mathematics for Computer Science Course Code: CSE301

Day & Date : **Tuesday, 19-Dec-2023** Max Marks : 60 Marks

Time : **2:00 pm to 4:00 pm**

Instructions:
a) All questions are compulsory
b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL) **(L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**
c) Use of non-programmable calculator is allowed
d) Assume suitable data if required.

Q.1 Attempt any two — **Marks** | **B.L** | **CO**

a) Calculate the quartile deviation of marks of 39 students in Mathematics given below — **6** | **L3** | **CO1**

Marks	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30
No. of Students	4	6	8	12	7	2

b) The runs scored by two batsmen A and B in different innings are given below. — **6** | **L2**

A	32	28	47	63	71	39	10	60	96	14
B	19	31	48	53	67	90	10	62	40	80

Determine who is more consistent?

c) Fit a Poisson distribution to the following data — **6** | **L3**

x	0	1	2	3	4
f	211	90	19	5	0

Q.2 Attempt any two

a) Fit a second degree parabola $y = a + bx + cx^2$ to the following data — **6** | **L3** | **CO2**

x	1	2	3	4	5
y	2	9	22	41	66

b) Fit a curve of the form $y = ab^x$ to the following data — **6** | **L3**

x	2	3	4	5	6
y	34.385	79.0856	181.90	418.36	962.23

c) A company producing fluorescent light bulbs claims that the average life of bulb is 1570 hours. The mean life time of sample of 200 fluorescent light bulbs was found to be 1600 hours with standard deviation 150 hours. Test for the company at 1% level of significance, whether the claim that the average life of the bulb is 1570 hours is acceptable. — **6** | **L1**

Given: At 1% level of significance, the critical value for two-sided test is 2.58, for right tailed test is 2.33 and for left tailed test is –2.33

Q.3 Attempt any two

a) The fuzzy set A and B be defined on the universal set X = {6,7,8,9,10} by $A(x)=\frac{2x}{2x+5}, B(x)=\frac{x}{x+1}; x\in\{6,7,8,9,10\}$. Show that $\overline{A\cap B}=\overline{A}\cup\overline{B}$ — 6 — L2 — CO3

b) Define i) The fuzzy set, ii) Support of fuzzy set, iii) Scalar cardinality of fuzzy set, iv) Subsethood degree of two fuzzy sets v) Height of fuzzy set and vi) Normal fuzzy set. — 6 — L1

c) Define α cut and strong α cut of fuzzy set and find ${}^{0.2}A$, ${}^{0.2+}A$, ${}^{0.9}A$ and ${}^{0.9+}A$ for the fuzzy set — 6 — L3

$$A=\frac{1}{x_0}+\frac{0.9}{x_1}+\frac{0.8}{x_2}+\frac{0.7}{x_3}+\frac{0.6}{x_4}+\frac{0.5}{x_5}+\frac{0.4}{x_6}+\frac{0.3}{x_7}+\frac{0.2}{x_8}+\frac{0.1}{x_9}+\frac{0}{x_{10}}$$

Q.4 Attempt any two

a) Find the root of the equation $x\log_{10}x-1.2=0$ using Bisection method up to four decimal places. Carry out five approximations. — 6 — L3 — CO4

b) Calculate the real root of the equation $2x^3-2x-5=0$ using Newton-Rapson method correct to four decimal places. — 6 — L3

c) Find a root of the equation $x-e^x+2=0$ using Secant method correct to four decimal places. — 6 — L3

Q.5 Attempt any two

a) Out of 800 families with 4 children each, how many families would be expected to have i) 2 boys and 2 girls, ii) at least one boy, iii) no girls? Assume equal probabilities for boys and girls. — 6 — L4 — CO2

b) Two brands of electric bulbs are quoted at the same price. A buyer was tested a random sample of 200 bulbs of each brand and found the following information — 6 — L3

	Mean life (hours)	S. D (Hours)
Brand A	1300	41
Brand B	1280	46

Is there significant difference in the mean duration of their lives of two brands of electric bulbs at 1% level of significance?
Given: At 1% level of significance, the critical value for two-sided test is 2.58, for right tailed test is 2.33 and for left tailed test is –2.33

c) Calculate $S(A,B)$ and $S(B,A)$ for the fuzzy sets given by the membership function — 6 — L3 — CO3

$$A(x)=1-\frac{x}{10}, B(x)=\frac{x}{x+2}; x\in\{0,1,2,3,4,5,6,7,8,9,10\}$$

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SWVSM's

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

S.Y.B.Tech.(Comp. Sci. and Engg.) (Sem-IV)

End Semester Examination,December-2023

Course Name : Operating Systems — Course Code: CSE404

Day & Date : **Saturday, 30-Dec-2023** — Max Marks 60 Marks

Time : **10:00 am to 12:00 pm**

Instructions:
a) All questions are compulsory
b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL)**(L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**
c) Use of non-programmable calculator is allowed
d) Assume suitable data if required.

Q. No		Marks	B.L	CO
1	**Attempt any two**	12		
a)	What is an Operating System and its services?		L1	CO1
b)	What is PCB? Explain its structure		L2	CO2
c)	Explain multithreading models with respect to process.		L2	CO2
2	**Attempt any two**	12		
a)	What is process scheduling? Explain scheduling criteria's		L2	CO2
b)	Explain Semaphore in detail		L2	CO3
c)	How deadlocks are occurred in the system?		L4	CO3
3	**Attempt any two**	12		
a)	Explain thrashing in detail		L2	CO4
b)	Differentiate between FIFO and LRU page replacement algorithm		L4	CO4
c)	What is virtual memory? How is it implemented?		L3	CO4
Q.4	**Attempt any two**	12		
a)	Draw and explain kernel I/O subsystem		L5	CO5
b)	Compare between Polling and Interrupt in I/O system		L4	CO5
c)	Explain streams with neat diagram		L4	CO5
Q.5	**Attempt any two**	12		
a)	Explain system calls in details		L2	CO1
	OR			
a)	Write a short note on thread library		L2	CO2
b)	Give Peterson's solution for process synchronization		L4	CO2
	OR			CO4
b)	Write a note on Demand paging		L2	

Seat No.	

SWVSM's

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

S. Y. B. Tech (Semester-IV)

End Semester Examination, December- 2023

Course Name :	Software Engineering	Course Code:	CSE405
Day & Date :	**Monday, 1-Jan-2024**	Max Marks :	60 Marks
Time :	**10:00 am to 12:00 pm**		

Instructions:
a) All questions are compulsory
b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL) **(L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)**
c) Use of non-programmable calculator is allowed
d) Assume suitable data if required.

		Marks	B.L	CO
Q.1	**Attempt any two**	**12**		
a)	Explain with neat diagram the Waterfall model.		**L2**	**CO 1**
b)	Give a detailed note on Requirements gathering and analysis.		**L5**	
c)	State and explain the Characteristics of Good SRS Document & Attributes of bad SRS.		**L4**	**CO2**
Q.2	**Attempt any two**	**12**		
a)	What is COCOMO? List and explain stages of COCOMO in briefly?		**L4**	**CO2**
b)	Explain Structure chart with a suitable diagram.		**L3**	
c)	Write a short note on following. i. SPMP Document. ii. Sliding window planning. iii. PERT Chart and Gantt Chart.		**L2**	
Q.3	**Attempt any two**	**12**		
a)	Discuss in detail about Black-Box Testing.		**L2**	**CO4**
b)	What is Integration testing? Explain various approaches of integration testing?		**L4**	
c)	What is Code review? Explain code inspection.		**L2**	
Q.4	**Attempt any two**	**12**		
a)	Write a brief note on the process of getting ISO 9000 certification.		**L2**	**CO4**
b)	What is software reliability? Explain briefly six metrics that correlate with reliability.		**L4**	
c)	Explain briefly Evolution of Software quality with necessary diagram?		**L2**	

Q.5	**Attempt all**	**12**		
a)	Write a brief note on Unified Modeling Language.		**L2**	**CO1**
	OR			
a)	Give a brief note on SEI Capability Maturity Model.		**L2**	
b)	Explain Program Analysis Tools.		**L4**	
	OR			
b)	State and explain the Role of Software Architecture.		**L4**	

Seat No.	

SWVSM's

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

S.Y.B.Tech.(Comp. Sci. and Engg.) (Sem-IV)

End Semester Examination, December- 2023

Course Name :	**Computer Organization and Microcontroller**	**Course Code:**	**CSE403**
Day & Date :	**Saturday, 16-Dec-2023**	**Max Marks :**	**60 Marks**
Time :	**2:00 pm to 4:00 pm**		

Instructions:
a) All questions are compulsory
b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL)
(L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)
c) Use of non-programmable calculator is allowed
d) Assume suitable data if required.

		Marks	B.L	CO
Q.1	**Attempt any two**			
a)	Enlist the Generations of Computer with example.	6	L1	1
b)	Define Mapping Function? List types of Mapping Function techniques and Explain any one in detail	6	L5	2
c)	Define Interrupts? Explain Interrupts priority Schemes.	6	L2	1
Q.2	**Attempt any two**			
a)	Represent decimal floating point number **67.50** in IEEE 754 format in double precision.	6	L5	2
b)	Write a note on i. Zigbee ii.Wi-Fi	6	L2	3
c)	Discuss Booth's Algorithm and solve 09 X 05 using it.	6	L3	2
Q.3	**Attempt any two**			
a)	Describe ARM7 FIVE stage Pipeline Processing	6	L4	4
b)	Draw and explain the Banked Register set of ARM Processor.	6	L1	4
c)	Describe the STATE and Instruction set of ARM Processor.	6	L2	4

Q.4	**Attempt any two**				
a)	Find the output for the following instruction. Consider PRE cpsr=nzcvqiFt_USER, r_0=0x000000F9, r_1=0xF0000004 i. MOVS r_0, r_1,LSL #1 ii. ADD r_2, r_0, r_1	6	L5	5
b)	Explain MOV Instructions set of ARM Processor with suitable example	6	L1	5
c)	What is Barrel Shifter? Explain with suitable example.	6	L1	5
Q.5	**Attempt any two**			
a)	Explain the Structure of Memory Hierarchy?	6	L4	1
b)	Draw and explain single bus organization of the data path inside a processor.	6	L1	3
c)	List the difference between General Purpose Computing System and Embedded System.	6	L1	4
d)	List and explain Logical Instructions set of ARM Processor	6	L2	2