

Shri Shankaracharya Institute of Professional Management & Technology



Department of Computer Science & Engineering

Class Test – I Session- Jan-June, 2023 Month- April

Sem- 4th [A & B] Subject- DISCRETE MATHS Code: B022411(014)

Time Allowed: 2 hrs

Max Marks: 40

Note: -

- 1) Attempt any **THREE** from unit I,
- 2) Attempt any **TWO** from unit II.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
Unit – I				
Q1	Define Quantifies, Universal and Existential quantifiers And also Express Boolean function $f(x,y,z)= x+y'z$ in sum of minterms	8	Apply	CO1
Q2	Define Logical equivalence statement and also prove that $p \Rightarrow (q \Rightarrow r) \equiv (p \wedge q) \Rightarrow r$	8	Apply	CO1
Q3	Define Conjunctive Normal Form and also convert Boolean function $f(x,y,z) = (x'+y+z') \cdot (x'+y+z) \cdot (x+y'+z)$ in Disjunctive Normal form	8	Apply	CO1
Q4	Draw Logic Network of $f = A \cdot B + C'$ and also Prove De' Morgan's law $\sim(p \vee q) \equiv \sim p \wedge \sim q$ by using truth table.	8	Apply	CO1
UNIT - II				
Q5	Define Cartesian product and Also prove that $A \times (B \cap C) \equiv (A \times B) \cap (A \times C)$	8	Evaluate	CO2
Q6	Define Partial Order Relation and Hence Show that, The Relation $(a,b)R(c,d) \Leftrightarrow (a+b)=(b+c)$ is an equivalence relation.	8	Evaluate	CO2
Q7	Define Hasse Diagram and Also Draw Hasse diagram for partial ordering $\{(A,B) / A \subseteq B\}$ on Power set $P(S)$ where $S = \{a,b,c\}$	8	Apply	CO2



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Department of Computer Science & Engineering

Class Test – I Session: January - June 2023 Month - Apr 2023

B. Tech. Computer Science & Engineering

Semester: 4th

Subject: Discrete Mathematics

Time Allowed: 2 Hours

Section: C

Code: B022411(014)

Max Marks: 40

Note: - All Questions Compulsory.

Q. N.	Question	Marks	Levels of Bloom's Taxonomy	COs
Q 1	Define Logical Equivalence. Show that $[p \vee (q \wedge r)] \equiv [(p \vee q) \wedge (p \vee r)]$.	[2+6]	Apply	CO1
Q 2	Define Boolean Algebra. Prove De-Morgan's Law Using the Properties of the Boolean Algebra.	[2+3+3]	Apply	CO1
Q 3	(i) Define Disjunctive Normal Form (DNF) and prove that the value of complete DNF in three variables x, y & z is equal to 0. (ii) Define Conjunctive Normal Form (CNF) and prove that the value of complete DNF in three variables x, y & z is equal to 1.	[1+3] [1+3]	Apply	CO1
Q 4	Find out the DNF and CNF of the polynomial $f(x, y, z) = [x + (x' + y)'] [x + (y'z)']$	[4+4]	Apply	CO1
Q 5	Draw the circuit of switching function $[a + (a'b)][a' + (ab)]$. Simplify the switching function and draw the simplified circuit.	[2+4+2]	Apply	CO1



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Department of Computer Science & Engineering

Class Test – I Session- Jan – June, 2023 Month- April

Sem- CSE 4th [B,C] Subject- Computer System Architecture Code- B022412(022)

Time Allowed: 2 hrs Max Marks: 40

Note: - All questions are compulsory

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
PART I				
Q1	Explain the three types of instruction format with example.	[8]	Understand	CO1
Q2	Draw and explain the data movement among registers using common bus.	[8]	Understand	CO1
Q3	An Instruction is stored at location 800 with its address field at 801. The address field has the value 350. A processor register R1 contains the number 210. Evaluate the effective address if the addressing mode of the instruction is: Direct, Immediate, Register indirect, PC Relative, Index with R1 as Index Register.	[8]	Apply	CO1
Q4	Consider a Bus System created for 16 registers of 32 bit each and answer the following- 1. How many multiplexers are used to create the bus system? 2. What is the size of each multiplexer? 3. The select line of multiplexer consist how many lines? 4. The bus consist of how many lines? Illustrate the above with a proper block diagram.	[8]	Apply	CO1
Q5	Analyze the functions of the control unit and categorize them. Examine why a microprogrammed control unit is preferable to a hardwired one (with diagram)?	[8]	Analyze	CO1



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Class Test – I Session- Jan – June, 2023 Month- April
Sem- CSE 4th [A] Subject:-Computer System Architecture Code- B022412(22)
Time Allowed: 2 hrs Max Marks: 40

Note: - All Questions are compulsory-

Q.N.	Questions	Marks	Levels of Bloom's Taxonomy	COs
Q.1	Draw and explain the block diagram of microprogrammed control unit.	[8]	Understand	CO1
Q.2	Explain various addressing mode with example.	[8]	Understand	CO1
Q.3	Define the format of micro instruction with proper figure and example.	[8]	Remember	CO1
Q.4	Analyze the various buses used in bus structure and express the importance of all buses.	[8]	Analyze	CO1
Q.5	Illustrate IEEE floating point number representation and its operation for 32 bits.	[8]	Apply	CO2



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Class Test – I Session- Jan-June, 2023 Month-April

Sem- 4th(A B & C) Subject- Database Management System Code-B022413(022)

Time Allowed: 2 hrs

Max Marks: 40

Note: - All questions are compulsory.

Q. N.	Questions	Marks	Levels of Bloom's taxonomy	COs
Q1	Discuss the three-level architecture in DBMS.	[8]	Understand	CO1
Q2	Define different types of Data Models.	[8]	Understand	CO1
Q3	Contrast the various terminology used in the Entity-relationship model with suitable examples.	[8]	Analyzing	CO1
Q4	Define relational algebra. What are the operations in relational algebra?	[8]	Understand	CO2
Q5	Describe Functional Dependencies. Point out Armstrong rule and distinguish between full FD and partial FD.	[8]	Analyzing	CO2

Note: - All the questions are compulsory.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
Q1	Write a program in Java to read from console, details of 5 employees with following : Name of employee, Department, Age, Salary. Also Print the details of every employee.	8	Apply	CO1
Q2	Explain the memory management by java garbage collector. Write a program to explain the same.	8	Apply	CO1
Q3	Discuss uses of Static in java (with suitable example).	8	Understand	CO1
Q4	Explain the steps involved for creating User defined exception.	8	Understand	CO2
Q5	Illustrate throws keyword in java. Also explain how it plays it's role with unchecked exception?	8	Analyze	CO2

Note: - All the questions are compulsory.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
Q1	Write a program in Java to read from console, details of 5 employees with following : Name of employee, Department, Age, Salary. Also Print the details of every employee.	8	Apply	CO1
Q2	Explain the memory management by java garbage collector. Write a program to explain the same.	8	Apply	CO1
Q3	Discuss uses of Static in java (with suitable example).	8	Understand	CO1
Q4	Explain the steps involved for creating User defined exception.	8	Understand	CO2
Q5	Illustrate throws keyword in java. Also explain how it plays it's role with unchecked exception?	8	Analyze	CO2



Shri Shankaracharya Institute of Professional Management & Technology

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Class Test – I Session- Jan – June, 2023 Month - April


Sem- 4th [C] Subject- Object Oriented Programming (with JAVA) Code- B022414(022)

Time Allowed: 2 hrs

Max Marks: 40


Note: - Attempt any 5 questions.

Q. N.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	Discuss the different data types in Java and how to convert one data type to another with example?	[8]	Understand	CO1
2.	Define Constructor. Write a program to calculate area of rectangle using constructor.	[8]	Apply	CO1
3.	Define this keyword with suitable example. Write a program to calculate percentage of 5 input values from user using Scanner class.	[4+4]	Apply	CO1
4.	Illustrate Java Virtual Machine and its architecture.	[8]	Apply	CO1
5.	Explain Inheritance in java with suitable example.	[8]	Understand	CO2
6.	Demonstrate use of super keyword in java with suitable example.	[8]	Apply	CO2


Shri Shankaracharya Institute of Professional Management & Technology
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 Class Test – I Session- Jan-June, 2023 Month- April
 Sem- 4th [A, B & C] Subject- Design & Analysis of Algorithms Code- B022415(022)
 Time Allowed: 2 hrs
 Max Marks: 40

Note: - All questions are compulsory.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
Q1	Apply Recursive method and find out the Growth rate for the recurrence equation $a_n - 2a_{n-1} + a_{n-2}$, when $a_0=5$ and $a_1=7$	[8]	Apply	CO1
Q2	$T(n) = \begin{cases} 1, & n = 0 \\ 2T(n-1) + 1, & n > 0 \end{cases}$ Calculate the growth rate of the above recurrence equation using substitution method	[8]	Apply	CO1
Q3	Write the Merge Sort Algorithm and analyze its time complexity.	[8]	Analyze	CO2
Q4	Write the insertion sorting algorithm and analyze its time complexity.	[8]	Analyze	CO1
Q5	Solve the following recurrence equation using Recursive Tree Method (i) $T(n) = 2T(n/2) + n$ (ii) $T(n) = 2T(n/2) + n^2$	[8]	Apply	CO1


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 Time Allowed: 2 hrs
 Max Marks: 40

Note: - All questions are compulsory.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
Q1	Apply Recursive method and find out the Growth rate for the recurrence equation $a_n - 2a_{n-1} + a_{n-2}$, when $a_0=5$ and $a_1=7$	[8]	Apply	CO1
Q2	$T(n) = \begin{cases} 1, & n = 0 \\ 2T(n-1) + 1, & n > 0 \end{cases}$ Calculate the growth rate of the above recurrence equation using substitution method	[8]	Apply	CO1
Q3	Write the Merge Sort Algorithm and analyze its time complexity.	[8]	Analyze	CO2
Q4	Write the insertion sorting algorithm and analyze its time complexity.	[8]	Analyze	CO1
Q5	Solve the following recurrence equation using Recursive Tree Method (i) $T(n) = 2T(n/2) + n$ (ii) $T(n) = 2T(n/2) + n^2$	[8]	Apply	CO1